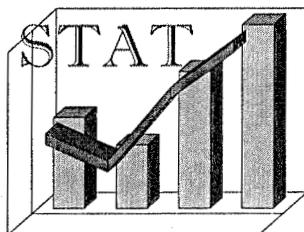


SELECTED STATISTICAL PAPERS



Statistical Assistance to the Government of Indonesia (STAT) Project
USAID Contract No. PCE-I-00-99-00009-00

BIDE

Boston Institute for Developing Economies

DAI 
Development Alternatives, Inc.

FOREWORD

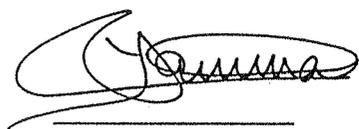
Since March 2000, BPS (Statistics Indonesia) has worked in partnership with the USAID-funded Statistical Assistance to the Government of Indonesia (STAT) project to design new activities based upon improved statistical techniques to better meet user demand for more accurate and timely data, particularly since the 1998 economic crisis. The project has helped BPS to introduce substantial improvements in its staff capacity in the areas of census and survey design and methodology, national accounts, industry, labor force and agriculture statistics.

The project has produced several statistical papers aimed primarily at outside users. Some simply document in detail the methodology of particular statistical series. Others explore data related issues in particular economic policy areas to stimulate discussion on them. These papers were the product of the joint partnership between BPS officials and project experts. As they have been produced, these papers have been made available for public access on the BPS website at:

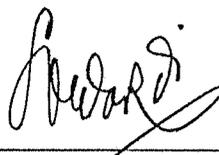
www.bps.go.id/papers/Papers_and_Analysis/Papers_by_BPS_and_USAID_Project.

We are very happy to provide users of Indonesian statistics with this volume which includes a select number of these statistical papers. A separate volume, aimed primarily at users in the districts, contains a Bahasa Indonesia translation of most of these papers. As always, BPS would welcome any comments and suggestions to introduce further improvements to its statistics.

Jakarta, June 2003



Dr. Yahya Jammal
Chief of Party
STAT Project



Dr. Soedarti Surbakti
Director General
BPS (Statistics Indonesia)

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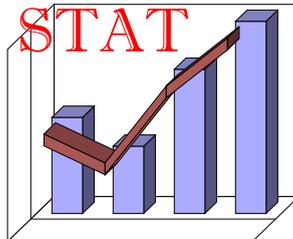
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EMPLOYMENT DATA IN INDONESIA : A REVIEW OF EXISTING SOURCES

Report # 5

by
Hananto Sigit

June, 2000



Statistical Assistance to the Government of Indonesia (STAT) Project
USAID Contract No. PCE-I-00-99-00009-00

EXECUTIVE SUMMARY

Objective. Indonesia has faced employment problems for a long time, which were caused by the apparent inability of the economy to absorb the large and rapidly growing labor force. Even during rapid economic growth, employment conditions did not seem to improve much. On the contrary, these conditions seemed to be the worse impacted by the economic crisis, leading to a deterioration in the quality of education, health and general living conditions. The prominence of these issues in policy debates require adequate data on employment. Given increasingly limited resources, the most appropriate course of action is to analyze existing data as thoroughly as possible before new data are added. This report attempts a review and a brief evaluation of all existing employment data. Major data sources are identified and discussed, particularly with regards to the methodology, coverage and type of data collected. Strengths and weaknesses of the data are outlined, as well as consistency across sources. Finally, a brief discussion is presented about the types of data needed to satisfy current employment policy concerns.

Employment Data Sources. Sources of employment data are classified into five categories. First *ad-hoc surveys* are differentiated from *regular surveys*. *Ad-hoc* surveys are especially conducted to capture the extent of the impact of the economic crisis. Regular surveys are differentiated into three categories: household, establishment and community data surveys based on their unit of enumeration. The units of enumeration are households and household members, establishment, and lower administrative regions respectively. Another data source, the agricultural census, enumerates both households and establishments engaged in agriculture. In addition, the Department of Manpower keeps administrative records on job vacancies-job seekers, foreign workers and Indonesian workers abroad.

BPS conducts a number of household surveys to collect employment data. These include specially designed employment surveys as well as multi-purpose surveys. The size, area coverage and type of information vary with the objectives of the surveys. But all adopt the same "labor force approach" and collect similar basic structural data. These surveys include the population census (SP), inter-censal population surveys (Supas), the national labor force survey (Sakernas), the national socio-economic survey (Susenas), and the "one-hundred village" survey (SSD).

Population censuses are conducted every ten years to collect general information on the population with one block focusing on the labor force and employment. All information needed to measure labor force and employment structure are included. Between census years, Supas is conducted to meet the needs for more frequent data. For comparability with census data, Supas adopts the same questions included in the sample census. At the heart of employment data collection is the specially designed Sakernas. Beginning in 1994, it was conducted yearly with a more detailed questionnaire. But in 1999 the sample size was reduced to produce detailed employment information only at the national level. Similar employment data are also collected in a multi-purpose household survey called Susenas. Still another household survey collecting employment data is the "one hundred village" survey to give a picture of the different typical villages represented by the chosen one hundred villages.

BPS conducts several surveys of establishments collecting employment data related to other information. Only data on groups of workers are available. The largest such survey, the economic census, is conducted to collect data on all non-agricultural establishments. In that survey all "incorporated" establishments are organized into a directory, which is updated every year using secondary data, and once every ten years through a complete count to form a benchmark. The "unincorporated" establishments are listed using the same questionnaire as that of "incorporated" establishments, and that list is used as a frame for sample selection. As part of the economic census, a survey of *small and cottage establishments* (SUSI) was conducted in 1998 in an integrated survey enumerating sample establishments drawn from that frame. What had previously been collected individually for unincorporated establishments (e.g. the STKU and the SKKR) were then integrated into SUSI. Data for employment in SUSI are broken down by gender, age group, education, paid/unpaid and remuneration categories.

In addition to SUSI and data collection for the directory, three establishment surveys are

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conducted: one for large and medium manufacturing industry (SIBS), one for hotels and one for employee wages. SIBS is conducted yearly. As part of production costs, components of payments to employees are collected in detail, and a separate block on employment is included containing questions on employees by gender, education and type of job. The hotel establishment survey is conducted in two stages: one for stock taking and one for room occupancy. The stock taking survey is conducted every year for all classified and unclassified hotels, and is designed to collect information needed for updating the directory. Data on employees are broken down into the following categories: paid/unpaid, male/female, foreign/domestic and type and level of education. No employment data are collected in the hotel room occupancy survey. The employee wage survey is conducted quarterly to specifically obtain wage data on employees of large and medium establishments in several sectors of selected provinces. In 1992 the survey was simplified to collect only information on average and median wage of workers under the rank of "supervisor", broken down by establishment size, gender, sub-sector and capital status (i.e. whether foreign, domestic or government owned).

To capture the multitude of agricultural sub-sectors with many different commodities produced, the agricultural census was organized into separate data collection activities, which can be grouped into two categories: a complete census of *establishments* and a sample census of *households*. Separate censuses were conducted for all establishments engaged in different agricultural sub-sectors, collecting group employee data and cost structure. A number of sample censuses were conducted covering households engaged in different agricultural activities, as well as for household earnings and cost structure.

So far BPS has conducted only two community data surveys: the *village potential survey (Podes)* and the *sub-district survey (SK)*. Podes is regularly conducted as part of a big activity (such as censuses and Supas) to collect socio-economic information on all villages. Employment related information collected are limited to the percentage of households engaged in different economic sectors. A *sub-district survey* was conducted once in September 1998 covering all sub-districts in Indonesia to provide a picture of the spread and intensity of the crisis. In this survey questions on unemployment were asked. BPS also conducted "economic crisis impact surveys" (SDK), which included data on: return migration, production cost, termination of employment and urban informal sector, cost of living and retail business in urban areas. These surveys were conducted on purposively selected regencies which were the most highly affected by the crisis.

Another source of data is the administrative records kept by the Department of Manpower. These include: job openings, job seekers, participants in public works programs, training programs, foreign workers in Indonesia and Indonesian workers working overseas. Employment data associated with particular programs are also available at the Department of Public Works. Coverage is small and documents have never been processed to produce useful statistics.

Strengths and Weaknesses. Establishment surveys, community data surveys and household surveys have different characteristics and therefore different strengths and weaknesses. Establishment surveys contain only limited data on employees, but such data can be related to information on cost, capital and output of the establishment. Another strength of data from these surveys is that they can be used to produce more detailed sub-sectoral employment and job classifications. Thus by merging employment data from these surveys with those from household surveys one can obtain more detailed sub-sectoral and occupational classifications.

Detailed individual data as well as general information on the establishment or the place of work and on the worker's household are available in household surveys. But the quality of the data depends on the size, objective and methodology used. There is a trade-off between the size and complexity of a survey and the quality of the data. More extensive information collected, such as in Susenas, makes it possible to conduct rich analyses. Another strength of a large sample is that it allows the provision of data for smaller administrative regions.

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One serious weakness of both types of surveys is that they cannot be used for short-term comparisons. Maintaining consistency of the questionnaire, the methodology and fieldwork would undoubtedly enhance our confidence in conducting serial analysis. On the other hand, continuity and consistency in the conduct of a survey may discourage any necessary actions to correct possible mistakes in the survey. So the choice is between maintaining any existing mistakes for the sake of consistency but running the risk of data misinterpretation, or revising the questionnaire in order to come up with more accurate figures.

Data derived from community surveys are useful for providing an indicative picture for smaller regions, only if the differences between them and the standard surveys are not large. Accordingly, concepts, definitions and categorization of answers should be kept as close as possible to those of the standard ones. Finally, administrative records are useful and necessary to provide quick indicators for particular aspects of the modern labor market. Even if the data are not complete, such partial indicators remain useful.

Data Consistency. Employment data from various sources generally suffer from lack of comparability. There is no *absolute truth* in employment statistics. Efforts undertaken so far to find the *true* figures by changing the questions and the questionnaires have not been very successful. In fact, they have only resulted in unexplainable fluctuations in employment statistics. It is our belief that policy makers and users in general will benefit far more from obtaining *consistent* and *serially comparable* statistics using the same sources.

Comparisons of employment statistics derived from different sources are more problematic. Employment data from household surveys cannot be matched directly with data from establishment surveys for three reasons. First, one person in an establishment survey may be recorded more than once if he/she works in more than one establishment, while in a household survey he/she is considered employed in his/her main job. Secondly, persons working in *non-establishments* are not captured in establishment surveys, but are captured in household surveys. Thirdly, the definition of work is different in the two surveys. Sectoral data are also different, since in establishment surveys the sectors are predetermined based on the *type of product/output* produced, while in household surveys it depends on the interpretation of the respondents

Currently Needed Employment Statistics. It is ironic that a less developed economy with less resources may need more statistics than a developed economy to cope with its more serious employment problems. It is absolutely critical that a balance be found between data needs and available resources. Data must be carefully selected to serve the most urgent and immediate needs. Production of data must be efficiently conducted to come up with the best and most relevant statistics to meet the optimal requirements of the economy.

Employment has long been an important factor in Indonesian economic growth. Data are required to observe changes in the employment structure in the past thirty years of development and recently to monitor the impact of the economic crisis. It is often suggested that the recovery should be employment-led, and that future sectoral development should be strongly based on employment creation. Accordingly, data must support the needs to monitor employment structural changes. In addition, especially during crisis and recovery periods, employment statistics are needed to reflect short-term fluctuations.

The economic crisis in Indonesia has provided indisputable evidence that the informal sector plays a prominent role in mitigating the impact of the crisis. Many people have reiterated the important role of the informal sector in providing employment for the excess supply of labor. Worsened by the crisis, the informal sector will undoubtedly exist in the Indonesian economy for a long time to come. Data on this sector must therefore be further developed and improved.

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LIST OF ACRONYMS

DPBH	Direktori Perusahaan Berbadan Hukum (Directory of Incorporated Establishments)
BPS	Badan Pusat Statistik (Statistics-Indonesia)
CDS	Community Data Survey
DOM	Department of Manpower
DPW	Department of Public Works
GDP	Gross Domestic Product
ILO	International Labor Office
ISIC	International Standard Industrial Classification
Podes	Potensi Desa (Village Potential Survey)
RBS	Retail Business Survey
Sakernas	Survei Angkatan Kerja Nasional (National Labor Force Survey)
SDK	Survei Dampak Krisis (Economic Crisis Impact Survey)
SE	Sensus Ekonomi (Economic Census)
SERMH	Study on Economic Resilience of Migrant Households
SI	Statistics-Indonesia
SIBS	Survei Industri Besar-Sedang (Large and Medium Manufacturing Survey)
SIVD	Studi Identifikasi Variabel Desa (Village Variable Identification Study)
SK	Survei Kecamatan (Sub-District Survey)
SKKR	Survei Industri Kecil dan Kerajinan Rumah tangga (Small and Household Cottage Industry Survey)
SOURT	Survei Struktur Ongkos Usaha Rumah tangga Pertanian (Sample Census on Cost Structure of Agricultural households)
SP	Sensus Penduduk (Population Census)
SRMH	Study on Resilience of Migrant Households
SSD	Survei Seratus Desa (One-Hundred Village Survey)
SSPR	Sensus Sampel Perkebunan Rakyat (Sample Census of People Plantation)
SSPRT	Sensus Sampel Pendapatan Rumah tangga Pertanian (Sample Census of Household Agriculture Earnings)
StRDC	Statistical Research and Development Center
ST	Sensus Pertanian (Agricultural Census)
STKU	Survei Triwulanan Kegiatan Usaha (Quarterly Establishment Survey)
SUB	Survei Upah Buruh (Employee Wage Survey)
SUIW	Study on Urban Informal Workers
Supas	Survey Penduduk Antar Sensus (Inter-Censal Population Survey)
SUPH	Sensus Perusahaan Palawija dan Hortikultura (Survey of food crops and horticulture establishment)
Susenas	Survei Sosial Ekonomi Nasional (National Socio-Economic Survey)
SUSI	Survei Usaha Terintegrasi (Small and Household Establishment Integrated Survey)
SUTBK	Sensus Perusahaan Temak Besar/Kecil (Census of Big and Small Cattle Households)
UN	United Nations

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I. INTRODUCTION

Excessive labor supply has been a major problem in Indonesian economic development. The large population of Indonesia has resulted in abundant labor supply, which is also rapidly growing as a consequence of the fast population increase. A large portion of this large and fast growing labor force could not be absorbed in the economy. This excess supply of labor has caused serious and widely spread employment problems, the most important of which is the existence of large segments of the informal sector and under-employment, low intensity and low productivity jobs causing low returns to employees. Consequently, the standard of living of the majority of the population remains very low. In fact a large proportion still lives in poverty.

Planners, policy makers as well as observers of the Indonesian economy have paid great attention to the problem of insufficient employment opportunity in the economy. Serious unemployment and underemployment, and low living standards have been serious problems for a long time and never became easier during the 40 years of economic development of the country. Even during the so-called "miracle" economy period (i.e. that of rapid economic growth in the nineties), the unfavorable employment structure did not change very much. Consequently, extensive employment data collection efforts have been undertaken since 1961 in response to this urgent need for solving employment problems.

The economic crisis has resulted in further worsening employment problems. Employment and income were the first affected by the crisis, which led to a deterioration in education, health and general living conditions. Alleviation of the impact of the crisis was given the highest priority in policy making. Consequently, it is becoming increasingly necessary to devise more and different types of data which would allow more adequate measurement of employment problems and monitoring of the economic crisis and recovery.

This report attempts a review and a brief evaluation of all existing employment data. Major data sources are identified and discussed, particularly with regards to the methodology, coverage and type of data collected. Strengths and weaknesses of the data are outlined, as well as consistency across sources. For ease of reference, these issues are highlighted in Table 1. Finally, a brief discussion is presented about the types of data needed to satisfy current employment policy concerns.

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Table 1
Employment Data Sources in Indonesia and Their Main Characteristics

No.	Source	Agency	Frequency	Survey Year	Coverage	Sample Size	Availability	Design Purpose	Strengths	Weaknesses
A.	Household Surveys									
1.	Population Census (SP)	BPS	Every 10 years	1981	All regions and municipalities	4-5% of households	6-18 months	Demographic and employment structure	Agency and municipality activities; rich analysis on employment structure	Insufficient for serial analysis; incomparability with other sources
2.	Inter-Census Population Survey (SIPAS)	BPS	Every 10 years	1976	Aggregate data for regions and municipalities	207,000 households	6-12 months	Demographic and employment structure	Rich analysis on employment structure; generalization. Comparability with census	Incomparability with other sources
3.	National Socio-Economic Survey (SUSENAS)	BPS	Quarterly, bi-annual, yearly since 1994	1983	Same questions for all regions	200,000 households	6-12 months	Employment and expenditure structure, and wage and salaries for employees	Rich analysis of employment with socio-cultural data	Incomparability with other sources; Lack of consistency in structure of questions; incomparability with other data sources
4.	National Labor Force Survey (LABORKENAS)	BPS	Quarterly and Data yearly since 1994	1976	All provinces	35,000 households	6-12 months	Employment structure and monitoring economic crisis impacts on employment	Specifically designed employment survey	Lack of consistency in structure of questions; incomparability with other data sources
5.	One Hundred Village Survey (SDS)	BPS	Quarterly	1994	Selected typical villages	12,000 households	3-6 months	Village welfare indicators	Estimates at village level	Not linkable with other data
B.	Establishment Surveys									
1.	Economic Census (SE)	BPS	Annual	1976	Full coverage, all regions	All establishments	one year	Directory of incorporated directory and sampling frame of non-incorporated establishments	Multi-sector and detailed sub-sectors	Linked employment data in part and unpaid workers
2.	Directory of Incorporated Establishments	BPS	Updated yearly	1996	All Indonesia	All incorporated establishments	Continuous improvement	Up to date directory of incorporated establishments	Multi-sector and detailed sub-sectors	Linked employment data in part and unpaid workers
3.	Large and Medium Manufacturing Survey (SEBS)	BPS	Annual	1975	All regions	All large and medium manufacturing est.	3.5-5 years	Cost and output structure, capital and investment	Full coverage of SME, establishments	Long time lag, limited coverage
4.	Small and Household Establishment Survey (SELS)	BPS	Quarterly	1986	All regions	90,000 establishments	6 months	Cost and output structure, capital and investment	Detailed sub-sectors, labor cost, and integrated all-sector establishments	Long time lag, limited employment data
5.	Hotel Establishment Survey (SEH)	BPS	Annual	1978	All regions	All hotel establishments	one year	Directory of hotels	Complete hotel coverage	Daily data on groups of employees
6.	Employee Wage Survey (SEAR)	BPS	Quarterly	1980	Selected provinces	Small sample of large establishments	6 months	Wage for employment groups	Good data on wage levels	Small coverage of sectors
C.	Agricultural Census (SE)	BPS	Every 10 years	1975	All regions	Complete census for establishments and sample for households	3-2.5 years	Agricultural structure	Detailed job classification, labor cost, and components of labor payments	Long time interval
D.	Ad-Hoc Surveys									
1.	Economic Crisis Impact Survey (SEIK)	BPS	Once	1998	A number of provinces	Small sample of households and est.	6-12 months	Economic crisis impacts	Estimates socio-economic data for monitoring crisis impacts	Incomparability with other sources; no serial data
2.	Sub-District Survey (SEK)	BPS	Once	1998	All sub-districts	1997 sub-districts	3 months	Spread of the crisis	Showing the spread and intensity of the crisis down to sub-districts	Incomparability with other sources
E.	Community Data Survey									
1.	Village Potential Survey (VOCES)	BPS	Every 2-5 years	1976	All villages	All villages	12 months	Multipurpose use	The only community data at village level	Incomparability with other sources
F.	Administrative Records									
1.	Job vacancies and job seekers	DDM	monthly	many years	complete record		monthly	Monitoring of policy making	Direct use of the data for policy making	Small coverage, not processed
2.	Employment in Public Works Program	DDM/DPW	yearly	many years	complete record		monthly	Monitoring of policy making	Direct use of the data for policy making	Small coverage, not processed
3.	Foreign Workers in Indonesia	DDM	monthly	many years	complete record		monthly	Monitoring of policy making	Direct use of the data for policy making	Small coverage, not processed
4.	Indonesian Workers Abroad	DDM	monthly	many years	complete record		monthly	Monitoring of policy making	Direct use of the data for policy making	Small coverage, not processed

II. EMPLOYMENT DATA SOURCES

Sources of employment data are classified into five categories. First, *ad-hoc* surveys are differentiated from the *regular* surveys undertaken by BPS. *Add-hoc* surveys are especially conducted to capture and monitor the social and economic impacts of the economic crisis in response to concerted efforts to minimize these impacts. For this purpose, only two such surveys have so far been conducted: the *Economic Crisis Impact Survey* and the *Sub-District Survey* in 1999.

Regular surveys and censuses are commonly differentiated based on the unit of enumeration used. Three categories of surveys have been conducted: *household*, *establishment* and *community data* surveys. Household surveys are conducted with *households* and *individual household members* as the unit of enumeration. Respondents are individual household members. Accordingly, information on both the household and its individual members is collected and becomes available through direct responses. Five surveys exist in this category: the Population Census, the Inter-Censal Population Survey, the National Labor Force Survey, the National Socio-Economic Survey and “One Hundred Village Survey”.

Establishment surveys employ the *economic establishment* as the unit of enumeration, which is usually represented by relevant officers in charge as the informants to fill the questionnaire. Only information on the establishment is collected. Individual information on employees cannot be collected, but group characteristics of employees may be included in the survey. For example, information on the number of employees classified by gender, education and permanent/temporary workers may be available. Several sources of employment data belong to this category: the Economic Census, the Directory of Incorporated Establishments, the Large and Medium Manufacturing Survey, the Small and Household Establishment Integrated Survey, the Employee Wage Survey and the Hotel Survey.

Similarly to establishment surveys, employment data in community data surveys are collected indirectly through local informants. These informants provide data for particular small administrative areas (villages or sub-districts) as the units of enumeration. Accordingly detailed household and individual employment cannot be collected. In fact community data are confined to far more aggregated information than those obtained from establishment surveys. Only one survey is conducted regularly by BPS, the “Village Potential Survey”. Another survey, the “Sub-District Survey”, is conducted by BPS but not regularly.

The Agricultural Census uses both households and establishments as units of enumeration. Since economic activities of the majority of the population are in agriculture, data are mainly collected from households, although some are also collected from establishments. With many different sub-sectors and different commodities, data collection in the agricultural census is highly complex. Moreover, *regular* household agricultural activities must be separated from *economic*

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activities in agriculture for living and only the latter need to be included in the agricultural census. Data collection from agricultural establishments is also complex, but much easier than from agricultural households, since the definition of agricultural establishment is clearer and the number of such establishments is manageable.

Another source of employment data is administrative records. The Department of Manpower (DOM) keeps records of “job vacancies” and “job seekers” in an effort to facilitate the working of the labor market. The Department also keeps records of employment created through government labor intensive projects (public works programs). Several of these projects were developed during the economic crisis to assist those most adversely affected.

The following sections will discuss all these data sources in detail.

A. Household Surveys

These include specially designed surveys to collect labor force and employment data and surveys collecting employment data as part of/together with other information. The size and area coverage of these surveys vary depending on their objectives. Surveys conducted as part of the population census are the largest in terms of the number of sampled households, and consequently allow the provision of information for small areas. Other smaller surveys produce detailed information only at the national level, with less detail for provinces. Still smaller household surveys provide information for only typical selected regions, and are not meant to provide national information at all. Coverage of information in various surveys is also different, but all adopt the same “labor force approach” and collect similar basic structural data. Surveys that fall under this category are:

1. Population Census (Sensus Penduduk, SP)
2. Inter-Censal Population Survey (Survey Penduduk Antar Sensus, Supas)
3. National Labor Force Survey (Survei Angkatan Kerja Nasional, Sakernas)
4. National Socio-Economic Survey (Survei Sosial Ekonomi Nasional, Susenas)
5. One-Hundred Village Survey (Survey Seratus Desa = SSD)

1. Population Census

The Population Census is conducted every ten years. To date, four censuses have been undertaken in 1961, 1971, 1980 and 1990. The 2000 Census is currently underway. The past four censuses collect general information on population which allows analysis of the population structure and problems. General socio-economic characteristics of the population are collected. Some important information collected relates to “economic activities” of the population, that is labor force and employment characteristics. The same labor force approach is used in structuring questions. The main objective is to provide benchmark data on the labor force and employment every ten years. The questions are less elaborate than those collected in Sakernas and Susenas, but all important employment questions needed to analyze the labor force and employment

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structure are included in the census.

Before the 2000 census, data collection was conducted in two parts. A “complete census” collected basic information on family structure covering the names of household members, age, sex and family relationship to household heads. The main objective was to produce basic information on the population at the lowest administrative level (villages). But this information was also used as a frame for sample selection of households to be interviewed in the “sample census”, in which detailed questions on each household member were asked in addition to questions on housing characteristics and facilities. Both parts of the Census covered all provinces. Fieldwork of the “complete census” was done in September-October, while that of the “sample census” was conducted in October. The Census date was October 31 of the relevant year. In the 2000 Census the time reference was moved to July in order to improve international comparison, as most countries collect mid-year population in their censuses.

Labor force and employment data are collected in the “sample census”. The sample is large, covering 4-5 percent of households. In 1990, the sample covered approximately 200,000 household. With such a large sample, sample censuses can provide aggregate data down to the regency level. In fact, population censuses are the only source of data which provides employment information for regencies. Detailed tabulations and refined classifications of the data can be provided at higher levels of administrative regions (i.e. provincial and national levels). Such tabulations include the structure of the working age population, characteristics of employment, information on job seekers, and characteristics of each segment of the labor force, as well as general socio-economic characteristics of the population.

The 2000 Census is a special case. It was designed to make the best use of the limited budget provided by the government in the aftermath of the economic crisis. The budget was not enough to finance the two-stage data collection used in previous censuses. To retain the main objective of the census (i.e. provision of data for smaller regions), a complete census was needed, otherwise it could not be considered a census. But funds were not sufficient for conducting an adequate “sample census” for detailed information. So a compromise was devised whereby selected information would be included in the complete census. Therefore, in addition to the basic questions on family structure, the 2000 Census includes one or two questions on fertility, education, migration, labor force and employment.

2. Inter-Censal Population Survey (Supas)

Supas is conducted regularly halfway between censuses. Its objective is to provide population data which could be linked to those from the censuses. The survey has so far been conducted in 1976, 1985 and 1995. The plan is to retain such data collection in the future, since Indonesia cannot afford to conduct a census every five years. With a population whose structure is considered to be rapidly changing, decennial censuses cannot capture these changes. More frequent data are needed to follow the rapid decline in fertility and mortality, as well as the

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accelerated migration due to intensive government programs.

Although the sample in Supas is large (207,000 households in 1995 and 125,400 in 1985), this is still smaller than the number of households interviewed in a typical "sample census". However, Supas still allows the provision of information for smaller regions which are comparable to those produced by the census. Accordingly, aggregate population trend data are available every five years. To conform with census data, Supas fieldwork is typically conducted in September-October.

Questions in Supas are similar to those in the "sample census". Labor force and employment data collected in Supas are also the same as those in the census, thus allowing measurement, every five years, of the structure and characteristics of employment and the labor force.

3. National Labor Force Survey (SAKERNAS)

Sakernas was conducted for the first time in 1976, with the specific purpose of collecting data on labor force and employment. This survey was designed to improve the weaknesses of employment data collected in the 1971 population census. Sakernas employed a rigid labor force approach using two reference periods: "current" and "usual". Since the labor force approach was used for the first time in that year, a comprehensive pilot test by BPS, in close cooperation with DOM and the ILO, preceded the implementation of the survey. The survey was then conducted once a year in 1977 and 1978, and was designed to obtain serial data to be linked with data from population censuses and Supas. It was stopped for a few years and was then resumed annually until 1985.

Beginning in 1986, the survey was conducted quarterly to capture the seasonal fluctuations in employment. With the Indonesian economy believed to be still predominantly agricultural, employment was believed to be greatly influenced by agricultural seasons. It was believed that sectoral employment and other related characteristics would depict the peak and trough seasons in agriculture. Fieldwork every year in February, May, August and November. The sample was approximately 20,500 households every quarter in 1992. Quarterly estimates could be merged to produce average information for the year with a total sample of 82,000 households.

Quarterly surveys were conducted for 8 years until 1993. Results showed that seasonal fluctuations could not be clearly depicted by the quarterly data. This seemed to be caused by the small size of the sample. With around 20,000 households, only national figures could be produced. With seasons different from region to region, averaging at the national level would produce the same results for every quarter. Without a substantial increase in the sample which would allow the production of regional data, such quarterly surveys would not be useful in depicting seasonality at the national level. Production of average figures for the year from the quarterly survey is also not useful, since data do not represent yearly figures with a certain point

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in time as the reference, but rather an average of four quarterly figures not comparable with other figures. Another drawback of the quarterly version of that survey was the limited number of questions included: only items believed to be affected by seasonality were included. Again this made results difficult to compare with those of other survey.

Following this reality, the quarterly survey was stopped and beginning in 1994 the survey was conducted yearly with more a detailed questionnaire. The sample size was reduced to 65,500 households. In 1998 the sample was again reduced to 49,200 households due to budget constraints. Until 1999, Sakernas was conducted in August of every year. The August employment figures from Sakernas would be compared with the employment figures from Susenas, which was conducted in February of every year. Sakernas would reflect employment conditions in the second semester while Susenas would reflect conditions in the first semester. In 1999, the Sakernas sample was reduced to about 20,000 households, and is expected to produce detailed information only at national levels, with only aggregate data for provinces.

A complete set of labor force and employment data is collected in Sakernas. The working age population (those aged 10 years and above, which was changed to 15 years and above since 1998) is classified into two segments: that in the labor force and that not in the labor force. The labor force consists of those working (“employed”) or looking for work (“unemployed”). For the “employed”, detailed characteristics of their work are collected, including hours worked, industry, occupation, status, additional works, wages and salaries, and whether also looking for work. For the “unemployed” the questions include ways and duration of job search, whether looking for part-time or full-time work, whether previously working and terminated from their work during the crisis and for what causes, and whether recently found a job. In addition, socio-demographic data are collected including age, gender, and education.

4. National Socio-Economic Survey (Susenas)

Susenas is a multi-purpose household survey. It has a long history in BPS. The first Susenas was designed and launched in 1963 by the Statistical Research and Development Center (StRDC), a UN organization created to assist statistical development in BPS. The main objective of Susenas was to collect data on demographic and socio-economic household characteristics. After 1963, the survey was conducted regularly in 1964/65, 1967, 1969 and 1970 with samples between 16,000-24,000 households. In all these surveys, labor force data were collected together with demographic and socio-economic data as well as consumption expenditure.

The survey temporarily stopped in 1971 with the termination of StRDC, and resumed again in 1976 with the funding from the government. In 1976 the survey was conducted quarterly to collect detailed consumption expenditure data. To capture the seasonal fluctuation of consumption, the survey was implemented in four quarterly rounds. Labor force and employment

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data were only collected in the fourth quarter of 1976, where the sample was enlarged to 78,000 households compared to only 17,000 households in each of the previous quarters. This quarterly survey was repeated in 1978 with a sample of only 6,300 households per quarter. The 1978 Susenas incorporated more topics, including labor force and other demographic, socio-cultural and health data, as well as data on consumption expenditure and income.

In 1979 and 1980 the survey was conducted twice every year with samples between 54,000-102,000 households to accommodate new modules. The new modules included fertility, handicraft/cottage industry, agriculture and livestock. Labor force data were only collected in the second semester of 1980. In 1981 Susenas was conducted quarterly again with a sample of 15,000 households per quarter and with no questions on the labor force. Information was limited to socio-cultural, health and consumption expenditure.

Labor and employment was included again in 1982 with a separate sample of 60,000 households. Other information on crimes, welfare, handicraft/cottage industry and prepared food consumption were collected separately from samples between 4,000 to 15,000 households. From that time on, the labor force module was taken out of Susenas and fully integrated with Sakernas. Consequently, the biannual Susenas in 1984 and the yearly Susenas in 1985-87 and 1989-91 did not contain any labor force module.

Beginning in 1992, Susenas was organized into two questionnaires: a new core and a module. Before 1992 the core questionnaire covered only five basic questions: four demographic and one on education. Welfare indicators are believed to be needed every year, since a large percentage of people are believed to be living below the poverty line. Accordingly, the government considered the reduction of poverty as a high priority. As most data on welfare are obtained from Susenas, important questions from the modules have been transferred to the core in order to enable production of yearly data.

The design of the new Susenas makes it possible to link modules through the core questions. For example, through the labor force and expenditure categories in the core, labor force characteristics in the module could be linked to the structure of expenditure in the module. It was considered important to include selected basic items on expenditure, causes of deaths, health, breast feeding, immunization, education, channels of communication, fertility level, family planning methods, housing materials and facilities, as well as economic activities. The economic activities incorporated basic questions on the labor force and employment, some limited questions enabling the construction of labor force structure, those working and those looking for work. For the employed the questions asked are: hours worked, industry and status.

In 1992 the sample size for the core questions was 65,600 households, which enabled estimation at national and provincial levels. From 1993 until recently it was enlarged to 202,000 households to enable estimation at the regency/municipality levels, while the sample size for the module is 65,600 households all along. With different modules, there must be a frame for sample

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selection for the module data collection. This is provided by households interviewed with the core questions comprising selected questions from the modules. From this frame a sub-sample of the core households is selected for a particular module. Accordingly, modules can be interconnected through the core questions. Therefore, from Susenas of 1992 through 1995 only limited data on employment are available.

Despite the benefits obtained from a multipurpose survey, where a very rich information base can be obtained, the system became very complicated. The preparation of the survey documents, training, fieldwork and data processing became difficult to organize. The labor force and employment module tended to be less accurate compared to the specialized labor force survey. Moreover this system made it impossible to design the same questionnaire as the one used in Sakernas.

After the economic crisis in 1997, Susenas was redesigned to simplify its operation. Only three modules were included. Consumption expenditure is collected every three years, and general information for the welfare indicators is taken as another module conducted every year. Another module collected every year covers labor force and employment and is designed to be comparable to the data from Sakernas.

5. One-Hundred Village Survey (SSD)

Providing information for small areas is very costly. It requires large samples which in turn require large scale and nationwide organization and implementation. Quality of results might be low due to sampling and non-sampling errors. For example, Supas with 208,000 households, could only produce information at the regency/municipality levels with a minimum level of confidence. SSD was created to capture social changes in typical villages. As indicated by the name of the survey, 100 villages are selected from 10 regencies in 8 provinces. They are about medium villages with populations of 500-1000 households purposively selected by considering the following characteristics: poor/non-poor, urban/rural, coastal/hinterland, Java-Bali/outside Java-Bali and West/East region. In every village, 120 households were enumerated to give a picture of the different typical villages, and was not meant to be summed up to portray the conditions of higher administrative levels.

BPS first conducted SSD in May 1994 under the name SIVD (Studi Identifikasi Variabel Desa). The purpose was to identify village variables closely related with poverty and to test Susenas as a tool for monitoring welfare at the village level. In May 1997 the survey was repeated in the same villages but with some modifications to monitor human resources and social infrastructure. This survey became known as SSD. In 1998/1999 SSD was implemented in four rounds (August 1998, November 1998, February 1999 and May 1999) so as to capture quarterly changes in socio-economic living conditions impacted by the economic crisis.

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Variables collected in the survey include demographic characteristics, health, education, labor force and employment, fertility and family planning, housing, consumption expenditure and food security, ownership of durable goods and land, access to public facilities, and village potential. In 1998 variables connected to the crisis impact were added. These include migration, public works, crime, crisis response, as well as variables related to the social safety net. Data on the labor force and employment cover: labor force structure, unemployment, and information on industry, occupation, status, hours worked and additional works for those working, and for those displaced from work the reasons for displacement.

B. Establishment Surveys

BPS conducts several establishment surveys which contain data on employment. As expected, most of these surveys usually collect data on production cost, input and output structure, capital formation, as well as information on business operation. Employment data are usually collected as part of the information on cost structure. In addition, data on participation in government development programs are also obtained from small and household establishments, since the government gives them credits and undertakes various programs to assist them.

The unit of enumeration of the survey is the establishment, which is defined as the smallest economic unit conducting a business activity by financing the production of goods and services and selling them for profit or for earning. The important element of being an establishment is the risk bearing, which it must assumed. These surveys collect *establishment data* provided by the responsible person in the establishment designated as the respondent. Usually only cost accounting and related economic data referring to the establishment are collected and provided by the respondents. Individual worker data cannot be collected from the respondents in these surveys, but data on group of workers, for instance, classified by gender, type of works, and education might be available. Establishment surveys currently conducted and containing employment data include:

1. Economic Census (Sensus Ekonomi, SE)
2. Directory of Incorporated Establishment (Direktori Perusahaan Berbadan Hukum, DPBH)
3. Quarterly Establishment Survey (Survey Triwulanan Kegiatan Usaha, STKU)
4. Small and Household Cottage Industry Survey (Survey Industri Kecil dan Kerajinan Rumahtangga, SKKR)
5. Small and Household-Establishment Integrated Survey (Survei Usaha Terintegrasi, SUSI)
6. Large and Medium Manufacturing Survey (Survei Industri Besar-Sedang, SIBS)
7. Hotel Establishment Survey (Survey Hotel, SH)
8. Employee Wage Survey (Survey Upah Buruh, SUB)

1. Economic Census (SE)

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BPS has so far conducted 3 censuses: 1976, 1986 and most recently in 1996. This decennial activity aims at collecting data on all economic establishments outside agriculture. Data for agricultural establishments is conducted separately in the agricultural census and surveys. Before the implementation of the 1996 Census, collection of establishment data was undertaken separately through a sector-wide surveys. These different surveys were undertaken in different years by different sectoral divisions in BPS. No or very little coordination took place to ensure comparability of the data.

The 1996 Census was conducted in stages starting in the beginning of 1996 and attempted to integrate all establishment data collections in BPS. A limited set of information was collected from all establishments, including large, medium, small and micro establishments. Like in many other establishment surveys, employment data were collected as part of information customarily collected from establishments including: identification and location, main activity, type of product, establishment status, value of assets, value of production, total earnings, and number of workers differentiated between permanent and temporary workers.

The Census differentiated between “incorporated” and “unincorporated” establishments. “Incorporated” establishments were kept in the directory, which was first established during the census preparation stage using available information in BPS and secondary information collected from other departments and organizations. The directory was then updated during census fieldwork. Newly found “incorporated” establishments were added to the directory, and those closed down were removed. “Unincorporated” establishments were not kept in the directory, because their number was large and their turnover was high. These were listed by visiting all households in the country, and the census questionnaire was applied to establishments found during the household listing. Fieldwork thus produced two results: a list of “unincorporated” establishments and information on establishments. The information collected was the same as that collected from those in the directory. For employment, therefore, data were confined to the number of permanent and temporary workers.

The list of establishments and related information was maintained as a frame for drawing samples for establishment surveys which were to be conducted at subsequent stages. This list is expected to be partially updated during the conduct of surveys of “unincorporated” establishments in subsequent years. After a period of ten years, the list will be totally renewed to form the basis of the next economic census.

2. Directory of Incorporated Establishments (DPBH)

During the economic census, all “incorporated” establishments (large and medium establishments for manufacturing industries) from all economic sectors outside agriculture are organized in a directory for the first time. Agricultural establishments are not included in the directory because they are listed separately during the agricultural census. The directory contains

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information on identification and location of the establishment, its main activity, total assets, value of production and employment (only the total number of permanent and temporary employees). BPS plans to gradually update the directory every year using secondary data sources and relevant surveys and to fully revise it every ten years.

3. Quarterly Establishment Survey (STKU)

In the years prior to the Economic Census, a quarterly establishment survey (Survei Triwulanan Kegiatan Usaha, STKU) was undertaken to collect relevant quick indicators to observe quarterly sectoral growth/changes in production in the services sectors to help prepare the quarterly GDP. The relevant indicators collected may be different from sector to sector, but most involved output and employment. STKU covered only establishments in services including transportation, banking and finance, hotel, travel bureau and restaurant, trade and services.

STKU was first implemented in 1987 only in Jawa. In 1988 North Sumatera and South Sulawesi were added, and again in 1990 ten more provinces were added. In 1994/95 STKU achieved its full development, covering all 27 provinces in Indonesia. The information covered in that survey was: the number of employees, wages and salaries, production indicators, sales/earnings and earnings from other sources. Fieldwork was conducted at the beginning of each quarter to collect data for the previous quarter. Since the survey is simple, the preliminary results were out in three months, and final results in six months. In 1996 the survey was integrated into SUSI.

4. Small and Cottage Industry Survey (SKKR)

This survey collects detailed data on small scale and cottage industries. It only covers selected provinces, which may differ from year to year. The 1993 survey, for instance, covered only 20 provinces including Jambi, Bengkulu, East Timor, Central Kalimantan, East Kalimantan, Mollucas and Irian Jaya. The total sample was 40,000 establishments. Data collection was conducted yearly between 1991 and 1995. Information collected in this survey was meant to supplement the data from SIBS. In 1998 this survey was integrated into SUSI.

5. Small & Household Establishment Integrated Survey (SUSI)

Following the implementation of the 1996 Economic Census, SUSI was conducted for the first time in December 1998 using the establishment list from the Census. As part of the Census activities, SUSI only collected indicators from “unincorporated” non-agricultural establishments which are mostly small and micro enterprises. However, some medium establishments may be “unincorporated” and thus would have to be included in SUSI. In budget years 1999/2000 and 2000, SUSI was implemented quarterly in the months of July and October in 1999 and in January and April of 2000. To get a serial picture, 50 percent of the sample from

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the previous survey was retained in the following survey. Questions were the same as those used in the 1998 survey. While STKU only collected indicators in the form of simple indexes just to get information on the rate of growth, SUSI collects detailed information on the establishment's activities including cost structure, output, capital and sector of production. Employment data collected are: number of employees broken down by gender, age group, education, paid or unpaid, and remuneration.

6. Large & Medium Manufacturing Survey (SIBS)

This survey is still routinely conducted every year. It collects more information than what is needed for the directory. Given the importance of this sector in Indonesian economic development, detailed information on the establishment is collected on cost of production, outputs and services performed, power generation, investments, capital and assets. As part of production costs, expenditure for employees are also collected in detail, with a breakdown by production and non-production workers. Components of expenditures include wages/salaries, pension contributions, insurance and other allowances. A separate block on employment includes a breakdown of the number of employees by gender, education (science, technical or others) and type of job (research and development, production engineering and others and working as researcher, technician, administrative staff, factory workers).

The survey covers all large and medium manufacturing establishments. Coverage depends a great deal on the completeness of the directory, which is updated regularly to add new establishment and remove those that closed down. A new system of directory updating was applied for Java in 1991 and outside Java in 1992. It checks the list of establishments with recent sources from other departments, and the unmatched establishments are checked in the field to make sure they exist.

The survey produces information for smaller sub-sectors of the manufacturing sector, up to the five-digit ISIC level. The response rate is about 85-90 percent. Given the large number of establishments and the long questionnaire, publication lag considerably behind. The 1997 data, for example, were only available in March 1999.

7. Hotel Establishment Survey (SH)

Collection of statistics for the hotel sector is based on recommendations of the World Tourism Organization (WTO) which relies on "accommodation statistics." But only a small part of these recommendations is adopted in the Indonesian hotel survey. The survey covers all 27 provinces in Indonesia, is conducted monthly. Two types of surveys are conducted: one covering stock taking and one room occupancy.

The stock taking survey aims at building a hotel directory covering all classified and non-classified hotels. It has been conducted yearly since 1978, and includes data on the number of

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rooms and beds, room rates, and distance from airport, bus terminals and train stations, as well as hotel facilities. In the past three years employment data have been grouped into more detailed classifications by gender, citizenship, type and level of education, as well as by status (paid/unpaid). The room occupancy rate survey started in 1980 and covers all classified hotels and a sample of non-classified hotels with at least 10 rooms. This survey is conducted monthly to collect data on number of rooms, beds, occupied rooms, foreign and domestic guests. It is useful for calculate occupation rate, average length of stay, number of foreign and domestic guests and average number of guests per room.

Like the large and medium manufacturing survey, these hotel surveys are continuously undertaken, and are also meant to support the updating of the directory of incorporated establishments. All hotels, including the non-classified ones (hotel melati), are included in the directory since the operation of hotels must be legal and licensed by the tourism office of the provincial governments.

8. Employee Wage Survey (SUB)

This survey was first conducted in 1979 to collect detailed information on wage development and structure, including distribution by occupation. It does not cover all economic sectors, only non-oil and gas mining, manufacturing, hotels and land transportation. It was simplified in 1992 by dropping the question on wage by occupation. Consequently, only average and median wage of workers under the rank of supervisor were collected, and by dropping the land transportation sub-sector. The sample size was also reduced. The survey was conducted quarterly to enable monitoring of changes in wages. Three provinces (Bengkulu, East-Timor and Central-Sulawesi) were left out. For non-oil and gas mining only 35 establishments were included in the sample, while for the manufacturing industry 667 large and 342 medium establishments were included. Small establishments were not represented. Fieldwork was undertaken quarterly in March, June, September and December every year. Wage data collected were the payments to production workers lower than a supervisor. Wages were broken down by establishment size, gender, sub-sector and capital status (foreign, domestic, government owned).

C. Agricultural Census (ST)

The Agricultural Census was conducted in 1963, 1973, 1983 and most recently in 1993. In terms of employment, agriculture is the largest sector in the economy but the living standard of its workers is the lowest. With most agricultural activities still traditional and informal, several government programs are implemented to help develop this sector. The sector has a large number of sub-sectors as well as commodities produced. More than one hundred million households are involved in agricultural production in one way or another. Censuses covering this sector must, therefore, be able to capture all these activities. That is why the agricultural census was organized

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into several separate data collection phases aiming at capturing activities of sub-sectors and covering areas important to government programs. The Census basically consists of two parts. First is the complete data collection covering agricultural establishments, village cooperative units and the "Village Potential Survey". The second part is the "sample census" of agricultural households, land-holding farmers and the "sub-sector agricultural households". In all the sample size is 20 percent of all enumeration areas, and 20 percent of households in the selected enumeration areas.

One activity in the establishment census covers those engaged in food crops and horticulture (Sensus Perusahaan Palawija dan Hortikultura, SUPH). Horticulture includes vegetable crops, ornamental and medicinal plants. Collection is done by complete enumeration of all 54 establishments engaged in this activity. Employment data are differentiated by gender, education, whether administrative staff/field workers/factory workers, whether managers/assistants/regular employees, and whether permanent or temporary workers (monthly or daily workers). As part of the cost structure, wages and salaries and other income components are collected by type of employee.

Similar employment data are collected in other establishment censuses, which cover:

1. Industrial plants (covering, for example, agathis, acacia and teak woods)
2. Wild Animal Culture and Nature Tourism
3. Possesses Rights for Forest Exploitation (HPH) and Permission for Woods Collection (IPK)
4. Big and Small Cattle
5. Fishery

The "Sample Census of People's Estates" (Sensus Sampel Perkebunan Rakyat, SSKR) collects data from all households engaged in the production of cash crops. Altogether there were 150,000 households engaged in plantations of different commodities including rubber, coconut, coffee, clove, cacao, kelapa-sawit, and lada. Other sample censuses cover different types of agricultural households. One such sample census covers agricultural households engaged in the sub-sectors of animal husbandry, land-holding farmers and forestry.

The "Sample Census of Big and Small Cattle Households" (Sensus Perusahaan Ternak Besar/Kecil, SUTBK) was conducted as part of the 1993 agricultural census. Data include the number of employees by status (permanent/temporary), gender and education. Also collected are data on daily workers according to number of days and man-days, as well as expenditures for employees (in money and in kind) given as wages and salaries, overtime, bonus, gift, and others. These data are collected in addition to information on cost structure, output, earnings, capital formation and land owned and used.

The "Sample Census of Agricultural Household Earnings" (Sensus Sampel Pendapatan Rumahtangga Pertanian, SSPRT) was also conducted as part of the 1993 agricultural census. In

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1983 it was also part of the census and was conducted in 1990 as *Survei Pendapatan Petani (SPP)*. It covers all households engaged in agriculture regardless of the sub-sectors. Altogether there were 900,540 households enumerated in 1993. The only employment related data collected in this survey were expenditures for wages and salaries.

Another sample census conducted during the 1993 agricultural census was the “Sample Census on Cost Structure of Agricultural Households” (*Survey Struktur Ongkos Usaha Rumahtangga Pertanian, SSOURT*). This was the third such survey, the first having been done during the 1983 agricultural census and the second blended in the 1990 SPP. Labor cost (wages and salaries) is collected in this survey.

D. Community Data Surveys

Community Data Surveys, conducted regularly by BPS, provide data on village collected from village officials. Some data are good and based on village records, but others reflect only the perception of village officials. Data on labor force and employment in the village are also collected.

1. Village Potential Survey (Podes)

This survey was first introduced in 1976 as the “Village Facilities Survey” (*Fasdes*) undertaken within the 1976 Supas. Since then the survey has been regularly conducted as part of a big data collection effort, such as censuses and Supas. It is convenient to conduct Podes as part of a bigger national data collection since all villages are visited during mapping or listing. Podes covers all villages: in 1990, for example, there were 67,515 villages. A 1993 Podes was conducted as part of the agricultural census and in 1996 as part of the economic census. Fieldwork is currently underway for a 2000 Podes as part of the Population Census. Employment related information includes percentages of households engaged in agriculture, manufacturing, trade, services, and others.

2. Sub-District Survey (SK)

This survey was conducted in September 1998 in all 4,025 sub-districts of Indonesia. The response rate was high: 99.2 percent or 3,992 sub-districts. The survey was meant to provide a picture of the spread and intensity of the crisis all over the country. Data collected cover household economic resilience, food and merchandise supply security, health and family planning, education, unemployment and crime.

Like other topics, information on unemployment was asked to informants in the sub-districts who were considered knowledgeable about the condition in the sub-districts during the crisis. These informants were medical doctors in public health centers, heads of sub-district education offices and staff of rural society development or agricultural personnel. They were asked about their perception of their sub-districts. To obtain good responses, questions were kept

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simple.

E. Ad-Hoc Surveys

During the economic crisis it was believed that there was urgent need to document how serious and widespread the social impact of the crisis was. Data collection was then required to obtain information in support of the formulation of programs and projects aimed at alleviating that impact. Such programs needed to be backed up by quick and comprehensive data in order to be able to reach the target groups as well as to monitor their results. To support these programs, universities and non-government organizations also conducted similar surveys, but the scope of the NGO surveys was usually small. One large survey was the “Indonesian Family Life Survey” (IFLS) funded by the Rand Corporation and implemented by the Demographic Institute-University of Indonesia, which focused only on health, education and consumption expenditure. No data on labor force and employment were collected.

One survey conducted by BPS in cooperation with the United Nations Development Program (UNDP) in 1998 was the “Economic Crisis Impact Survey” (Survei Dampak Krisis, SDK). This survey aimed at monitoring the impact of the crisis on the living conditions of the population and the continuation of their economic activities and was undertaken through several rounds and intensive observation. Aspects which were studied included: return migration, production cost, termination of employment, urban informal sector, cost of living and retail business in urban areas, and village potential. It was not designed to provide a rigorous representation of regional/national data for policy formulation. Rather, it was meant to provide an early warning to the government of the spread and seriousness of impact of the crisis. That is why only a few regencies were purposively chosen for selection of a sample of establishments and households. These were the ones believed to be most affected by the crisis. Three particular studies were done in this regard:

a. Study on Urban Informal Workers (SUIW): This study aimed at collecting information on informal workers in urban areas, to test the common belief that those terminated from their jobs tended to stay in urban areas and mostly shifted to informal jobs. A survey was conducted in only 7 urban regencies. Information collected included: demographic characteristics of household members, housing condition and facilities, economic resilience of the households, and very detailed questions on labor force and employment of household members including their participation on labor intensive projects, and activities before and after job termination.

b. Study on Economic Resilience of Migrant Households (SERMH): This study, which attempts to determine the impact of the crisis on migrants, contains labor force and employment data.

c. Retail Business Survey: This survey collects data on supply, sales and prices of merchandise. It also collects employment data, including number of employees,

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working days, daily hours worked, number of shifts in a day, whether employee has undergone any job termination and how many.

F. Administrative Records

Most data on labor force and employment are collected and provided by BPS . The only other sources of such data are the Department of Manpower (DOM) and the Department of Public Works (DPW). DOM provides data on registered job openings and people seeking work. So coverage of this segment of the labor market is small, since not all establishments offering job openings register with DOM. In fact, most of them usually advertise their job vacancies publicly to reach a wider pool of job seekers. Moreover, companies generally shy away from DOM, because of its complex bureaucracy. Also highly qualified job seekers seldom register with DOM; they prefer to apply directly to the desired companies. Although in theory job vacancies should be registered with DOM, in practice only mass recruitment is usually through that department. Another problem with this source of data is that not all documents are processed, limiting further their usefulness for market-wide analysis. For these data to be of any use, therefore, a reliable system must be developed, particularly to incorporate data from other sources.

Other data produced by DOM include employment created by government programs. Data on participants of padat-karya programs (labor intensive infra-structure projects), training conducted by DOM, foreign workers in Indonesia, Indonesian workers working overseas and their remittances are maintained in DOM. Since the programs are conducted by that department, and since by law they are required to register with it, such data should be good, although some available to users because they are not processed.

Employment data associated with public works programs may also available at the DPW. Data may consist of the number of persons recruited for infrastructure construction, or those involved in labor-intensive projects similar to those conducted by DOM. The degree of availability of the DPW employment data is similar to that of DOM: data are not systematically processed to generate regular statistics

III. STRENGTHS AND WEAKNESSES

Establishment surveys, community data surveys and household surveys have different characteristics and therefore different strengths and weaknesses. Information in establishment surveys is given by the person(s) designated by the company to answer the questionnaire, and the answers are mostly based on establishment records. Consequently, the concepts and definitions used in this type of survey must be suited to those already applied in the establishments. In addition, one cannot ask in such a survey questions directly related to individual workers, unlike in household surveys, where specific questions are addressed to individual household members.

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Accordingly, in establishment surveys one does not face the constraint of using definitions and concepts dictated by the labor force approach.

A. Establishment Surveys

Establishment surveys contain only limited data on employees, but such data can be related to information on cost, capital and output of the establishment. Employee data can also be broken down by gender, marital status, age group, education, and occupation group. Relating employment data to other costs of production makes possible the analysis of cost structure to see whether labor is fairly paid. Comparison of capital to labor cost can be used to determine whether the establishments are capital or labor intensive. And in relation with output or value added, one can analyze the share of labor in value added, compared to returns on other production factors.

Another strength of data from these surveys is that they can be used to produce more detailed sub-sectoral employment and job classification. Household surveys on the other hand may provide full coverage of all sectors but the sub-sectoral breakdown is limited to the 2-digit ISIC level. The breakdown of occupation in household surveys is provided to the 3-digit ISCO level, and individual employment can be grouped in this classification. But the 2 and 3 digit occupation classification data are not reliable and seldom used. Both the interviewers and the respondents are not able to correctly interpret the detailed occupational classification. Establishments are in a better position to provide such data. Thus by merging employment data from these surveys with those from household surveys one can obtain more detailed sub-sectoral and occupational classifications. Of course, one needs to do this carefully by making adjustments due to conceptual differences. This is the type of exercise done, for example, when constructing an input-output table which requires that employment data be available for more than 140 sub-sectors.

B. Household Surveys

Detailed individual data (including demographic, socio-economic and employment characteristics) as well as general information on the establishment or the place of work and on the worker's household are available in household surveys. But the quality of the data depends on the size, objective and methodology used. There is a trade-off between the size and complexity of a survey and the quality of the data. More extensive information collected, such as in Susenas, makes it possible to conduct rich analyses. Another strength of a large sample is that it allows the provision of data for smaller administrative regions.

BPS conducts regularly five types of household surveys: the population census, Supas, Sakernas, Susenas and the "One Hundred Village" survey. Since these surveys used the same basic concepts and definitions of employment, one would expect that their results to be comparable. But employment data from these sources are not comparable for other reasons. While censuses and Supas, which are designed with the same objective of collecting general population

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data, produce somewhat comparable results, their data are not comparable with the other three surveys. Employment data for these three surveys, which were designed for different objectives, are also not comparable.

Sakernas and Susenas data are not comparable because they are derived from different types of survey. Susenas is a multi-purpose survey, with information collected in many different fields organized in two questionnaires: one as a core and one as a module. The methodology and implementation of the survey is very complex. The quality of employment data is greatly affected by the collection of other information. Sakernas, on the other hand, as a survey specifically designed for collecting employment data should produce the most reliable data. It has been consistently undertaken in August of every year since 1994, all the survey personnel have been familiar with the concepts, definitions and questions, making it easier to interpret various questions in a uniform way and thus produce results which are consistent from year to year.

But continuity and consistency in the conduct of a survey also has a downside: it discourages survey managers from taking necessary actions to correct mistakes identified in the concepts, definitions or procedures. So one has to make a choice: keeping any existing mistakes for the sake of consistency but running the risk of data mis-interpretation, or revising the questionnaire in order to come up with more accurate figures but producing results which are not comparable to previous surveys.

Because of their large sample of households, the population census and the inter-censal population survey can provide employment statistics for smaller administrative regions down to regencies/municipalities. Employment information can then be statistically linked with other characteristics of the population including family structure, fertility, mortality and migration, as well as housing conditions and facilities. Rich cross-sectional employment analyses can therefore be performed with these data, in addition to serial comparisons. The only drawback is that when the structure of questions in the questionnaire changes, it makes serial analysis more difficult.

Susenas provides a rich source of data, richer than even the census or inter-censal population survey, because it contains far more information. However, it suffers from high variability in the information collected. Another shortcoming relates to employment data contained in the core questionnaire: questions are limited and are placed following other more dominant questions. Thus despite the benefits derived from the large size of the sample, Susenas employment data suffer more from a higher level of instability of the data compared to Sakernas.

One serious weakness of both surveys is that they cannot be used for short-term comparisons. Maintaining consistency of the questionnaire, the methodology and fieldwork would undoubtedly enhance our confidence in conducting serial analysis.

C. Community Data Surveys

Data derived from Community surveys are useful for providing an indicative picture for

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smaller regions, only if the differences between them and the standard surveys are not large. Accordingly, concepts, definitions and categorization of answers should be kept as close as possible to those of the standard ones.

IV. CONSISTENCY OF DATA FROM DIFFERENT SOURCES

To make the best use of all available data in BPS, data must be made *comparable* to the extent possible. In other words, one must be able to be put them in one *map*. But one, of course, cannot expect employment data from different sources collected for different purposes employing different data collection procedures to be fully comparable. Data are most useful when used for the purpose they were designed. But in practice users often attempt close comparisons of employment figures from different sources. This section attempts to briefly highlight some issues related to consistency of employment data derived from the various sources stated above.

A. Instability of Employment Statistics

After the 1996 Economic Census, the definition of “employees”, “paid” and “unpaid”, as well as “permanent” or “temporary”, has been made clear and uniform in all establishment surveys. The breakdown of employment statistics by sub-sector, type of work, education, age and gender has also been standardized. Moreover, establishments are now consistently divided into two statistical groups: the “incorporated”, defined as those in the directory, and the “unincorporated”, defined as those non-agricultural establishments not in the directory. Similarly, the use of the establishment as the enumeration unit has also been standardized since the 1996 Economic Census.

However, the same cannot be said of household surveys. Although the basic concepts and definitions have been retained since 1976, certain aspects of data collection have greatly influenced response, causing employment statistics not to be strictly comparable over time or across surveys. Questions on sex, age, marital status, and education, for instance, are straight forward and cannot be misinterpreted. But answers to questions on whether a person is “working” or “looking for work” may depend on how the questions are phrased and perceptions of the interviewer as well as the respondent. This is particularly complicated for a developing country like Indonesia. The boundaries between “working” and “not working” in the informal sector, which dominates the labor force, can be arbitrary. Similarly for “looking for work”, especially among those looking for informal work. Such inconsistencies are compounded when the number of respondents is very large, especially the widely different backgrounds and experiences of enumerators. In interviewing households, not only are concepts and definitions important, but also how the questions are asked as well as the order in which they are asked.

That is why I believe that no employment statistics give us the *absolute* truth. The real truth may never be known. Survey results can only be considered *relative*, depending on various

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aspects of the design and the organization of field enumeration. Thus I believe that efforts to find *true figures* by *improving* questions and questionnaires have not succeeded. In fact, they only resulted in unexplainable fluctuations in employment statistics. On balance, therefore, I believe that policy makers and users will benefit far more from obtaining *consistent* and *serially comparable* statistics (by retaining the same questionnaire) from the same source than by continuing the futile effort of “improving” questionnaires in order to reach the *absolute truth* about employment.

Comparisons of employment statistics from different sources are more problematic. Sakernas and Susenas were supposed to produce comparable results: using Susenas for the first semester of a particular year and Sakernas for the second semester. However, these two surveys have never produced comparable results. Susenas figures for the unemployment rate have always been higher (see Table 2).

Table 2
Comparison of Unemployment Rates in Susenas and Sakernas

	1997	1998	1999
Susenas (February)	5.14%	7.00%	6.43%
Sakernas (August)	4.68%	5.46%	6.36%

Of course, one main reason for the difference is the fact that Susenas is a multi-purpose survey while Sakernas is specially designed for employment. But another reason may be that Susenas adopts the latest version of Sakernas. Since by design Sakernas August figures of a particular year are comparable with Susenas February figures for the following year, the two figures for the same year may not be comparable.

B. Comparison of Establishment & Household Survey Data

Employment data from household surveys can not be matched directly with data from establishment surveys for at least three reasons. First, multiple jobs cannot be captured in establishment surveys. One person in an establishment survey may be recorded more than once if he/she works in more than one establishment, while in a household survey he/she is considered employed in his/her main job. Consequently, employment levels obtained from establishment surveys are conceptually higher than those based on household surveys. Secondly, persons working in *non-establishments* are not captured in establishment surveys, but are captured in household surveys. Thus sectoral employment levels in household surveys are generally higher than their corresponding sectors in establishment surveys. Thirdly, the definition of work is different in the two surveys. In household surveys a person is considered “working” if he works for at least one hour in a week, while in establishment surveys the definition of “employees” is

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mostly based on whether that person was on the company's payroll for that year or not. Again, this will cause larger employment in household surveys. Sectoral data are also different, since in establishment surveys the sectors are predetermined based on the *type of product/output* produced, while in household surveys it depends on the interpretation of the respondents

Despite the above conceptual differences, it is not impossible to reconcile data from these sources and put them on one *map*. Such data can be analytically linked, as is done for example when an Input-Output table is constructed, requiring detailed sectoral employment data in head counts as well as in man-hours. But undoubtedly the best way is to reconcile the two sources at the planning stage. Improvement and simplification of the methodology used in both household and establishment surveys is needed to produce directly linkable data. It is worthwhile to look at this aspect of data consistency to make the data more useful and applicable. Serious efforts should be attempted in reconciling these employment data.

C. Comparison of Household & Community Survey Data

Employment data reported by informants in the community survey are very simple. In most cases, only their general impression on the number of people employed and unemployed is required. Other information collected may include whether the person is working in agriculture, industry or in other sectors. But even with such simple information, reported data are not comparable with those from household surveys, since it is not possible for the informants to apply the definitions used in such surveys. The "employed" and "unemployed" as defined by the standard labor force approach used in household surveys are not clearly identifiable in conditions observable daily in the areas. For instance, an "unemployed" persons according to the definition, is one "looking for work and not working at all". When applied to field reality, the "unemployed" (*menganggur*) are those not working and doing nothing. The latter version is the one which most likely influences the perception of the informant. Informants may witness that many people during the day are not working but are just getting together chatting, talking and drinking. So they report high a unemployment rate. But these people may be working in the formal sector or working marginally in the informal sector, or they may not be working but also may not be looking for work. By definition they should not be considered as unemployed. Similarly, the number of people "working" is not comparable with that obtained from household surveys, since it is doubtful that informants can capture the standard definition of people working at least for one hour in a week . Those working marginally in the informal sector are not likely to give the impression that they are working.

These differences are not possible to fully reconcile, but they can be minimized. And they should be minimized because household survey figures are likely to be used as the reference for comparison. Unemployment in their villages or sub-districts will be considered high or low based

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on the more commonly used national or provincial figures from household surveys. To minimize these differences, guidelines should be provided to informants. While still kept simple, the classification should be made similar to the one used in household surveys. For instance, instead of two employment categories (“employed” and “unemployed”), we can introduce another category: “not in the labor force”. This way the unemployment figure will be close to that in household surveys. The three categories are still simple and should be well understood by informants, who are usually educated intelligent people in the village.

V. CURRENTLY NEEDED EMPLOYMENT STATISTICS

It is ironic that a less developed economy with less resources may need more statistics than a developed economy to cope with its more serious employment problems. It is absolutely critical that a balance be found between data needs and available resources. Data must be carefully selected to serve the most urgent and immediate needs. Production of data must be efficiently conducted to come up with the best and most relevant statistics to meet the optimal requirements of the economy.

A. Measurement of Structural Changes

Employment has long been an important factor in Indonesian economic growth. There was a debate over whether the success of economic development before the economic crisis was accompanied by large employment creation and resulted in a better labor force and employment structure. It was disputed whether there was a significant structural change from a reliance on agriculture and mining to one on industry and services. Was the modern sector growing fast enough and absorbing enough informal workers to reduce the degree of underemployment? Some even went further and questioned whether the Indonesian economy had moved from labor surplus to labor shortage economy characterized by increasing real wages. After the crisis it was strongly suggested that further economic development should make more use of existing resources, and that human resources must be used effectively to speed up recovery and improve living conditions. According to this line of thinking, sectoral growth policies should take employment into consideration, and small-scale and agro-industries were recommended as the engine for future Indonesian economic growth. Accordingly, employment data are required to support the needs to monitor employment structural changes.

Therefore, the need for structural employment statistics will become stronger in the future. Consequently, BPS should continue and improve the current labor force data collection based on the labor force approach, classifying working age population into employed, unemployed and not in the labor force. Structurally, unemployment will undoubtedly increase with the modernization

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of the economy. And in line with modernization, employment will shift from rural to urban, and from informal/traditional to formal/modern. The success of employment creation in the future is expected to drastically change the composition of employment status: the own-account and unpaid family workers will greatly decline, while the proportion of employers and employees will increase. Working will be more stable, less seasonal and more productive, and consequently multiple jobs will be reduced. Shifting of sectoral employment will also continue, and the pattern of the change will depend on growth policy. Employment statistics need to depict at least these structural changes.

B. Measurement of Short-Term Trends

In addition to answering structural change questions, employment statistics also need to reflect seasonal movements, since the Indonesian economy is still dominated by traditional agriculture. Critical policy questions need to be answered, among others: what aspects of employment are influenced by seasonal movements; is work intensity in agriculture different during peak and low seasons; does agricultural employment decline during low seasons; what sectors can absorb agricultural workers; what is the composition of formal/informal employment; are seasonal patterns different by gender, education and other characteristics of individual workers.

Employment data are also needed to monitor closely the impacts of economic crises. It has become urgent to monitor the employment situation to provide answers to questions such as: how many people have lost their jobs; has overall unemployment increased; has underemployment increased; has work intensity and productivity declined; have real wages declined; have people moved from the more affected urban areas to rural areas to settle for employment within the family; what sectors were hardest hit; how do households and communities respond to employment deterioration. During economic recoveries, such indicators are needed to address questions in the opposite direction, e.g. how many people gained new employment etc..

Even in non-crisis situations, more frequent employment indicators are needed for monitoring developments in the labor market. Tracking demand and supply of labor in the modern sector is useful in understanding the mechanism of wage determination in the modern sector, which in turn influences earning levels in the informal sector. The labor market for the whole economy cannot be understood without knowing the modern labor demand and supply.

The need for monitoring short run employment developments cannot be overstated. Of course, one does expect BPS to provide all the data mentioned above. However, BPS can evaluate what data can and cannot be provided. Data can then be prioritized based on a cost/benefit evaluation and budgetary constraints, and a decision can then be made on the most effective course of action.

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C. Informal Sector

The economic crisis in Indonesia has provided indisputable evidence that the informal sector plays a prominent role in mitigating the impact of the crisis. Many people have reiterated the important role of the informal sector in providing employment for the excess supply of labor. The sector is believed to provide a “safety valve” for employment in Indonesia, absorbing agricultural workers who migrated to urban areas. It has been a major part of the economy for a long time and will undoubtedly exist in the Indonesian economy for a long time to come. Data on this sector must therefore be further developed and improved.

Currently two sources of data are available to assess informal sector employment. The first is from household employment surveys (such as Sakernas and Supas) and the second from establishment surveys. Estimates of informal employment in household surveys are obtained from data on status and occupation. The self-employed (except professionals), own-account and unpaid family workers are considered as workers in the informal sector. Employers and employees (except agricultural labor) are classified as formal workers. Employment can then be divided into two categories (informal and formal) with different characteristics (based on the data items collected in the survey). Other estimates of income are derived from establishment surveys. And for the manufacturing sub-sectors are derived from survey of small and cottage industries. Micro establishments are generally considered as informal, and data include: production costs, expenditure for labor, number and characteristics of employment groups, output structure, capital, business operation, marketing and participation in government programs. Based on this information average earnings of different groups of workers are calculated. Although such estimates exist, they have so far been underutilized. More and better indicators should still be constructed from these data to show informal sector changes.

D. Implications of Regional Autonomy

The types of employment data required from BPS will certainly be greatly influenced by the government's decision on regional autonomy. As we understand it, it has not yet been decided whether to exempt BPS activities from decentralization or to grant autonomy to regional statistical offices. Currently the production of statistics is highly centralized, which was a natural response to the central development planning of the past. With regards to the production of employment statistics, one can see two extreme cases and an unlimited number of scenarios in between. One extreme would be that full autonomy in statistics is granted to regional statistical offices and the other would be that the current centralized system remains intact.

If full autonomy is granted to regional offices, then these offices will presumably be catering primarily to the needs of their regional governments, which may result in a need for independent regional survey design, implementation and processing. The role of the central BPS office would be limited to one of coordination, standardization of measurements and the

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production of statistics of national importance. That, of course, would have dramatic functional and organizational implications which are difficult to predict at the present time. On the other hand, if the decision is to exempt statistical activities from regional autonomy, then BPS can continue to produce national as well as regional statistics, and hopefully streamline data collection procedures in order to enhance their efficiency in the face of tight budget constraints.

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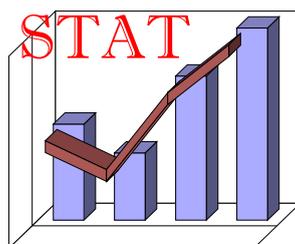
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EARNINGS DATA IN INDONESIA : A REVIEW OF EXISTING SOURCES

Report # 10

by
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Earnings Data Review

EXECUTIVE SUMMARY

Objectives. Concerns on employment and low income have been at the forefront of Indonesian policy making for decades. Consequently, extensive data collection efforts have been undertaken since 1961 in response to emerging needs in tackling these policy concerns. The need for relevant and timely data became particularly critical in the wake of the 1997-1998 economic crisis. In Indonesia, collecting data on earnings is not easy, since household members, individually or in groups, are engaged in many different activities to obtain income barely sufficient to support their livelihood. Different techniques have been tried to get earnings data with reasonable accuracy. A previous report reviewed major existing employment data sources. This report reviews existing sources of earnings data in Indonesia and attempts a brief discussion of their major strengths and weaknesses. Finally, it identifies what earnings data are needed and recommends broad methodological improvements.

The Concept of Earnings. To understand what constitutes earnings data, one must understand the activities and transactions conducted by households and household members. Theoretically, households consume and save, while establishments produce and invest. In addition to wages/salaries, households also receive non-wage incomes and transfers, as well as use borrowing or saving withdrawals to finance consumption. Earnings and all related items can be organized into four inter-related accounts: *income and expenditure*, *transfers*, *cash* and *fixed capital*.

Incomes are obtained as payments for services performed, or as compensation for the use of cash or fixed capital. These different types of income accrue to individuals, groups of individuals, households or establishments. One important type of income is *wages/salaries* as payment to employees. Those who work as *own-account or self-employed* workers receive compensation in the form of "*wages*" or *net earning*. Individuals who own a business (*employer*) outside the household, receive *dividend/profit*. In addition, individuals who own cash capital earn income in the form of *interest* or *dividend*. Individuals may also invest in fixed assets and rent them out to earn some *rents*. Dividends, profit, interest and rent may also accrued to households, if the cash investment and assets are owned by the household.

To obtain income, a large number of households undertake economic activities, performed together by several household members. The contribution of individual household members cannot be separated and thus cannot be measured. Some may be paid individually for their work, but most are not. The income generating activities are theoretically separated from the regular household activities, and are considered to be performed by an economic establishment called a *household micro-enterprise*. Income in this case is usually measured as outputs minus inputs accrued to the household, not to any individual.

Transfers are payments received, not in return for goods sold or services performed, but for other reasons. With the existence of a large number of poor households, transfers play an important role in narrowing down the income gap. Transfers among households, and between households and government or establishments are very common. Contributions, gifts, cash received from begging, stealing or gambling, scholarships, taxes, subsidies, inheritances, and premium payments for insurance against damage and loss are common transfer items. For the net transfer recipients, transfers add to income which can be used for consumption and saving.

Savings may take the form of *cash* or *fixed capital*. Cash capital transactions include saving deposit/withdrawal, lending and borrowing, or buying/selling stocks and bonds. Fixed capital transactions include purchase and sale of cars, houses, land and jewelry. Purchase of durable consumption goods is considered as consumption, while purchase of fixed assets is considered as fixed capital investment. Changes in the value and composition of these accounts will affect the non-wage income of the household or the individual household member. Collection of data on these transactions in a household survey is important to avoid mis-classification of earnings components.

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Earnings Data Review

Earnings Data Sources. BPS collects earnings data through different types of surveys. Not all employment data sources collect earnings. Surveys collecting earnings data can be grouped into three categories: household surveys, establishment surveys and agricultural censuses. Household surveys collect individual and household earnings data from *households* and *individual household members* as the units of enumeration. Household surveys collecting earnings data are the *National Labor Force Survey (Sakernas)*, the *National Socio-Economic Survey (Susenas)*, and the *Producer Price Survey of Farmers*. Establishment surveys use *economic establishments* as units of enumeration, and earnings data are collected in the form of labor cost as part of production cost structure. Establishment surveys collecting earnings data include the *Large and Medium Manufacturing Survey (SIBS)*, the *Small and Household Establishment Integrated Survey (SUSI)* and the *Employee Wage Survey (SUB)*. Agricultural Censuses use both households and establishments as units of enumeration. Accordingly, in household agricultural censuses household earnings are collected, while in the establishment agricultural censuses only labor cost is collected.

Only the 1976 and 1977 Sakernas collected individual and household earnings. Individual incomes were collected from all household members working as employees, own-account workers and employers in the form of wages/salaries, production minus cost, rents, and interest. Household income from agriculture was collected for detailed agricultural sub-sectors. Starting in 1988, only wages/salaries were collected until the recent 1999 Sakernas. BPS collected earnings data in household surveys for the first time in the 1963/64 Susenas. The same survey was replicated in 1964/65, and variations of it were conducted in 1969, 1978/79 and 1981. The methodology and schedules changed several times to improve earnings data. But some apparent misunderstandings remained in the concepts of income, transfer, cash and fixed capital items until the recent Susenas. For the years 1984, 1987, 1990, 1993 and 1999 income data were collected consistently using the same schedules.

BPS conducts several establishment surveys to collect data on labor costs. In SIBS, labor costs are differentiated by whether they are paid to production or non-production workers, while the components include wages/salaries, pension contributions, insurance and other allowances. The 1998 SUSI differentiated labor payments by wages and salaries, and other payments for overtime, bonus, gifts and others. The specially designed quarterly wage survey (SUB) was simplified in 1992 to collect only average and median wage of workers under the rank of supervisor in non-oil and gas mining, manufacturing and hotels. In 1993 three more sectors were added: construction, trade and restaurants.

Agricultural censuses include establishment and household surveys. In establishment surveys, labor costs are collected by type of employee, in money and in kind given as wages and salaries, overtime, bonus, gift, and others. In the household agricultural census, labor cost data can be averaged also by number of man-days, and wages/salaries are collected for different types of work including land preparation, seedling, planting, fertilizing, pest and weed control, taking care of plants, harvesting, post harvest activities, and others. Other incomes accrued to household members are collected then added to household agricultural income to estimate total household income of agricultural households.

Strengths and Weaknesses. Since 1988, Sakernas has collected only wages and salaries from employees. Its most significant strength is the fact that it collects wages and salaries fully incorporated in detailed employment data, thus allowing users to conduct elaborate analyses on different aspects of employment. One big weakness, however, lies in its coverage of employment status. Employees are often mixed up with the self-employed. The current survey deliberately included farm labor as employees, which should be more appropriately classified as self-employed. Moreover, since practically everybody working independently for pay in the informal sector considers himself as *buruh* (i.e. “employee”), the true number of “employees” is overestimated.

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Susenas' main strength is its explicit collection of detailed individual and household incomes, even if undertaken only once every three years. No other single survey provides such detailed information on value and cost of production. One big drawback, however, is the constant changes of the methodology and the questionnaire making it difficult to undertake inter-temporal analyses of particular component variables. Only since 1984 did Susenas use a better survey instrument. The differences in survey instruments reflect some misunderstanding in the concepts of household incomes, transfers and capital accounts, and has resulted in underestimation of household income.

The annual Large and Medium Manufacturing Survey (SIBS) provides labor cost information broken down by up to the five-digit ISIC level. Payments to employees and its components, are separated for production and non-production workers, and whether they are paid in cash or in kind, while its components include wages and salaries, overtime, gifts, bonuses, pension payments, social contributions, insurance and other similar benefits, and accident allowances. Its major weakness, however, is the long lag (more than 2 years) in data availability.

In SUSI the number of employees is broken down by detailed classification, while labor cost data are only broken down by gender. Consequently, only wage per employee by gender can be computed. The detailed classification of sectors (until 4 digit ISIC) is the major strength of wage data in SUSI. Since SUSI is an establishment survey with the establishment as the unit of enumeration, no household incomes are collected.

Data collected in the *agricultural establishment census* are limited to labor costs as part of the cost structure. Labor cost and employment are broken down by commodity group and for different types of jobs: land preparation, seedling, planting, fertilizing, pest and weed control, taking care of plants, harvesting, post harvest activities and others. Therefore, average wage per worker or per man-month can be calculated for different commodity groups and different jobs. From the *household agricultural survey*, both individual and establishment income data are collected, with the objective of estimating household income. However, in a particular sub-sectoral survey, only household income in the corresponding agricultural sub-sector is collected in great detail. Household incomes from other agricultural sub-sectors and non-agricultural sectors may be available separately but will not be as reliable. Therefore, income data from different surveys on agricultural sub-sectors tend to be inconsistent.

Recommendations. Three general recommendations are provided to improve overall earnings data collection in BPS:

- To avoid any unnecessary inconsistency the questions and their arrangement in the questionnaire must be kept as uniform as possible. In this case the 1999 Susenas questionnaire can be used with some improvements. All items related to income included in the questionnaire must be conceptually valid and exhaustive to arrive at a correct estimate of household income.
- To come up with conceptually correct wages/salaries, agricultural labor in Sakernas need to be taken out of the "employee" category and treated separately. In addition, profit and net earnings need to be introduced along with wages/salaries in order to ensure that wages/salaries are not included in compensation to self-employed workers.
- Labor cost in establishment surveys need to be separated into a wage and a non-wage component. In addition, grouping of employees and labor cost spending needs to follow a meaningful classification of workers. In addition to economic grouping, such as by sector, occupation, and types of workers, socio-demographic breakdown must also be considered.

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GLOSSARY

Arisan	rotating saving among family members or close groups.
Bagi Hasil	Production Sharing
BPS	Badan Pusat Statistik
Buruh	Indonesian word for persons doing any odd jobs receiving compensation in the form of upah (wage).
DKI	Daerah Khusus Ibukota, Special Regency of Jakarta
HPH	Hak Pengelolaan Hutan, Right for Forest Exploitation
IPK	Ijin Pengambilan Kayu, Right for Log Collection
ISCO	International Standard Classification of Occupation
ISIC	International Standard Industrial Classification
Sakernas	Survei Angkatan Kerja Nasional, National Labor Force Survey
SHPP	Survei Harga Produsen di Pedesaan, Producers Price Survey in Rural Areas
SIBS	Survei Industri Besar dan Sedang
SPP	Survei Pendapatan Petani, Survey of Farmers Income
SSOURT	Survei Struktur Ongkos Usaha Tani, Survey on Cost Structure of Agricultural Households
SSPRT	Sensus Sampel Pendapatan Rumah Tangga Tani, Sample Census of Farmers Incomes
StRDC	Statistical Research and Development Center: a center established by the UN and BPS to assist statistical development in BPS
SUB	Survei Upah Buruh, Employee Wage Survey
Susenas	Survei Sosial Ekonomi Nasional, National Socio-Economic Survey
SUSI	Survei Usaha Rumahtangga Terintegrasi, Integrated Survey of Household Enterprises
SUKP	Survei Upah Karyawan Perkebunan, Estate Employee Wage Survey
SUPAS	Survei Penduduk Antar Sensus, Inter-Censal Population Survey
UN	United Nations
Upah	Wage paid as compensation to employees and to other blue collar workers doing any odd job

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I. INTRODUCTION

Concerns for employment and low incomes have been at the forefront of Indonesian policy making for decades. In addition to unemployment, one of the most important issues is the existence of a large informal sector in the economy causing under-employment and creating low productivity jobs resulting in low worker returns. As a result, the standard of living of most people is low, and a large segment of the population still lives below the poverty line. Extensive data collection efforts have been undertaken since 1961 in response to emerging needs in tackling employment policy concerns. Employment and earnings data were collected in household and establishment surveys. The need for relevant and timely data became particularly critical in the wake of the 1997-1998 economic crisis. Since then Indonesia has seen a proliferation of employment and earnings data collection efforts aimed at shedding some light on the impact of the crisis on different segments of society in general and on the poor in particular.

In Indonesia collecting data on earnings is not easy, since household members, individually or in groups, are engaged in many different activities to obtain income barely sufficient to support their livelihood. Different techniques have been tried to get earnings data with reasonable accuracy. In household surveys, earnings have been collected as part of employment information with the emphasis on individual income, or as part of expenditure focusing on household income, while in establishment surveys labor costs are included as part of the cost structure of production.

A previous report (Sigit, 2000) reviewed major existing employment data sources. This report reviews existing sources of earnings data in Indonesia and attempts a brief discussion of their major strengths and weaknesses. Finally, it identifies what earnings data are needed and recommends broad methodological improvements.

II. MEASUREMENT OF EARNINGS

Many people tend to loosely identify earnings with wages. That is clearly wrong, particularly in a country like Indonesia, where non-wage employment is about three times wage employment. At the household level, total income exceeds wages when household members engage in different activities in search of sufficient income to support themselves. Earnings can be obtained not only from performing a particular job, but also from renting out household assets and from returns on savings. Earnings are often confused with other household transactions, such as selling used household goods, saving withdrawals, and gifts from relatives.

To understand what constitute earnings data, one must be familiar with activities and transactions conducted by households and household members. Households and establishments

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have different functions. Households consume and save, while establishments produce and invest. In practice, activities of households and establishments are more complicated because households also receive non-wage incomes and transfers, as well as use borrowing or saving withdrawals to finance consumption, and establishments commonly use external resources. Household earnings and related data can generally be organized into four accounts: *income and expenditure, transfers, cash* and *fixed capital*. Income and expenditure constitutes the main household account, incorporating major household transactions. Transfers are important because they are very common among households, and between households, government and/or establishments. Cash transactions, not as transfers but as capital, are regularly undertaken by households to cover investment/dis-investment. And since such transactions also affect income and expenditure, they are usually collected in household surveys. Since fixed capital transactions, covering the purchase and sale of fixed assets, also influence earnings and indirectly affect consumption, they are also covered in household surveys.

A. Income Account

Income is a payment for services performed by an individual, a household or an establishment, or a payment to an entrepreneur for running a business. But income is also a compensation for the use of fixed or cash capitals. For best result, incomes accrued to individuals must be collected for each individual. However, some incomes may not be easily separated for each individual if they are the result of collective work of several members of the household. The best way to collect such income data is through the household. Similarly, establishment income must be collected through the establishment. Table 1 summarizes various types of income received by individuals and households.

**Table 1
Types of Individual and Household Income**

	Type of Income Received	
	Wage Related	Non-Wage Related
Individuals Working as		
Own-account worker	wages, costs excluding other inputs	interest, rent, dividend, transfer
Unpaid family worker	none	interest, rent, dividend, transfer
Employee	wages/salaries	interest, rent, dividend, transfer
Employer	none	interest, rent, dividend, transfer
Household	“net profit”	interest, rent, dividend, transfer

1. Individuals

One type of income is *wages/salaries* paid to individuals working as employees.

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Sometimes this payment is called honorarium, especially if it is paid to temporary employees of a higher rank. Wages/salaries may be paid in cash or in kind, and wage structures may differ from one company to another based on the type of incentive for inducing employees to work hard. The Indonesian word for wages is “*upah*”, which is commonly understood to refer to compensation for any work performed by individuals, including work involving “odd jobs”. Therefore, even if an individual is self-employed or an own-account worker, he would consider himself as “*buruh*” (literally meaning labor) and payment for that work as *upah*. In household surveys conducted in Indonesia, such individuals are often mistakenly classified as “employees” receiving “wages/salaries”. This is one reason why wages/salaries in household surveys are lower than those paid by establishments to their employees.

Own-account or self-employed workers often receive compensation in the form of profit, if the work done is based on a contract involving the use and purchase of inputs. In this case, their earnings (or income) is gross revenue minus the cost of inputs. The input cost may also include payment for labor, if labor is hired for such work. In this case, such contract workers should be more suitably classified as “own-account” or “self-employed” workers rather than employers, since their use of workers is on an *ad hoc* basis. Individuals owning a business and working as *employers* outside the household receive income in the form of dividends/profits. If the company they own is formal, some of the profit is retained in the company, and an agreed amount of dividend is given to owners/stockholders. But if the company is small and informal, the owners may claim all the profit.

In addition, individuals may own cash capital (such as saving deposits, stocks, bonds), and those lending money may earn income in the form of interest. Individuals may also invest in fixed assets, such as cars, houses, and land.

2. Households

A large number of households in Indonesia conduct economic activities which are performed together by several household members. The contribution of individual household members cannot be separated and thus cannot be measured. Some may be paid individually for their work, but most are not. Rather, they have a right to the income as a family. Distribution of their income follows their individual function in the family: e.g. household head, spouse, children, etc. For example, children are entitled to basic necessities, schooling and health costs.

This type of economic activity is performed by economic establishments called “household micro-enterprises”. Income in this case is usually measured as outputs minus inputs accrued to the household, not to any individuals. Although theoretically such household incomes should be possible to measure, in certain sectors, e.g. trade, the measurement is difficult. The main reason is that buying and selling as well as consumption occur simultaneously and continuously. No records are kept to track down the trade margin, or the quantity bought, sold or

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consumed for each commodity. Moreover, incomes from households engaged in agricultural activities are also difficult to collect due to the complexity of these activities.

As was mentioned in the case of individuals, households may also own cash capital and property, and incomes may be derived from these sources. In this case, interest, rents, dividends will accrue to the household, since the cash and fixed capital/equipment are owned by household members as a group rather than by any individual member. In practice, however, even if the property belongs to the household, it must be under the name of one of the household members. Therefore, data can be collected as either household income or individual income. Collecting data under the name of a household member is preferable because it can be consistently undertaken with the same individuals.

B. Transfer Account

Transfers are payments received, not in return for goods sold or services performed, but for non-economic reasons. They are one-sided transactions. Common forms of transfers are: contributions, gifts, cash received from begging, stealing and gambling, scholarships, subsidies, inheritances, and premium payments for insurance against damage and loss.

Households from higher income levels are involved in different kinds of transfers compared to low income households. For example, low income households may receive government subsidies for food and education, and from richer households gifts and other contributions. Therefore, low income households as a group have positive transfers in, which are used to increase their consumption level. High income households, on the other hand, may not receive subsidies from the government. On the contrary, they must pay higher taxes, give contributions, and their money may even be stolen. So overall, this group has a negative net transfer balance (more transfers out than transfers in).

Transfers add to income available for consumption. Therefore, with positive net transfers to low income groups and negative net transfers from high income households, income differences will be reduced.

C. Cash Capital Account

Cash capital transactions include savings, withdrawals of saving deposits, lending, borrowing, receipts of payments from borrowers, payments of debt, buying stocks and obligations. But interest, receipt of dividend, receipt of capital gain on sale of a stock etc. are incomes. Cash capital transactions are important to collect in household surveys since they help in distinguishing between various sources of earnings, and in determining the correct estimate of income of the household.

Since cash capital also produces income, the cash capital account can be used for checking reported income items. If a household/individual owns a saving deposit, there must be a

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corresponding interest income accruing to the household/individual. And if the household/individual engages in the stock market, then income is obtained from capital gains and dividends.

D. Fixed Capital Account

Another account for which data are commonly collected in household surveys is the fixed capital account. Purchases and sales of houses, cars, jewelry and other precious goods are examples of transactions included in this account. Opinions may differ on what should be considered as “fixed capital”, or an investment good and what should be considered as a consumption good. Some may consider a car or jewelry as consumption goods while others may consider them as investment goods. By and large, household durables such as furniture, electronic consumption goods and kitchen appliances are consumption goods, while houses, land, jewelry, cars and other similar goods, are investment goods. The purchase and sale of these assets may produce profits for the household or the household member. Alternatively, these assets may be rented out in return for “rent” income. So household survey data on “fixed capital” accounts can lead to a better understanding of household income, and can in turn be used to check the completeness of income data reported by households.

E. Relationship Between These Accounts

It may be useful at this point to show how all the above sources of earnings fit together. The sum of incomes of individual household members plus any additional household net revenue equals total household income. This income plus net transfers to households equals household earnings, which are used by the household for consumption and/or saving. What form do savings take? They may take the form of deposits, debt obligations, cash or fixed capital. In turn, they may be used to buy land, houses, cars, machinery, or other equipment. The type of saving will directly affect household income receipts. Changes in the value and composition of these accounts will affect non-wage income of households or individual household members. Based on book-keeping theory, the four accounts are related. Table 2 shows how.

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Table 2
Relationship Between the Four Household Accounts

Account	Receipt	Spending
Income & Expenditure	wages & salaries, other income, net transfers (TI - TO)	consumption goods, consumption of durables, net cash capital investment (IN - DI), net fixed capital investment (P - S)
Transfer	transfers in (TI)	transfers out (TO)
Cash Capital	dis-investment (DI)	investment (IN)
Fixed Capital	sales (S)	purchases (P)

Net transfers in the income-expenditure account are obtained from the transfer account (TI - TO). Similarly, net cash and fixed capital investments are obtained from the cash capital (IN - DI) and fixed capital (P - S) accounts respectively. The sum of net cash and fixed capital investments equals household savings, which also equals household income plus net transfers minus consumption expenditure (including purchases of durable goods).

III. EARNINGS DATA SOURCES

Data on earnings are difficult to collect. Respondents are reluctant to report them for various reasons. Some are afraid that such data might be used for tax collection. Others may simply think that how much they earn every month is something personal, not to be shared with others. Many wealthy individuals may not even know how much they earn. Similarly, the poor do not know exactly how much they earn from different ad-hoc sources. Most people tend to report lower levels than what they really earn. Past experience suggests that earnings data collected by BPS are underestimated. They are consistently lower than household expenditure.

BPS collects earnings data through different types of surveys. Not all employment data sources collect earnings data. Surveys collecting earnings data can be grouped into three categories: *household surveys*, *establishment surveys* and *agricultural censuses*. Community data surveys and administrative records do not provide earnings data.

Household surveys are conducted with *households and individual household members* as units of enumeration. Respondents are individual household members. Accordingly, both detailed household and individual information, including earnings, are collected and become available through direct response. There are three regular surveys in this category collecting earnings data: the *National Labor Force Survey*, the *National Socio-Economic Survey* and the *Producers Price Survey of Farmers*

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Establishment surveys use *economic establishments* as units of enumeration. They are usually represented by relevant officers in charge as the informants to fill up/answer the questionnaire. Only information on establishments is thus collected. Individual questions on employees cannot be collected. However, group characteristics of employees may be included in the survey. Earnings data are collected in the form of labor cost (some are broken down into groups of workers), as part of the cost structure. Several sources of establishment surveys collecting earnings data include the *Large and Medium Manufacturing Survey*, the *Small and Household Establishment Integrated Survey* and the *Employee Wage Survey*.

Agricultural Censuses use both households and establishments as units of enumeration. Since the majority of households in Indonesia are engaged in agriculture, agricultural census data collection is conducted through households, in addition to the agricultural establishment data collection. With so many different sub-sectors producing different kinds of commodities, agricultural census data collection is complex. Moreover, *regular* household activities must be separated from the *economic activities* of households. Only agricultural economic activities need to be included in the agricultural census. With a large number of sub-sectors and commodities, the separation of these two activities becomes more complex.

A. Household Surveys

BPS conducts several household surveys, some especially designed to collect employment and earnings data and others including employment and earnings as part of other information collected in the survey. The size and area coverage of these surveys vary depending on their objectives: some only produce detailed information at the national level, and some provide information for provinces. Three household surveys collect data on earnings: the *National Labor Force Survey* (Survei Angkatan Kerja Nasional, Sakernas), the *National Socio-Economic Survey* (Survei Sosial Ekonomi Nasional, Susenas) and the *Producers Price Survey of Farmers* (Survei Harga Produsen di Pedesaan, SHPP)

1. National Labor Force Survey (Sakernas)

a. Data Collection

Sakernas was conducted for the first time in 1976, with the specific purpose of collecting data on the labor force and employment. This survey was designed to overcome the weaknesses of employment data collected in the 1971 population census. Sakernas employed a rigid labor force approach using two reference periods: one “current” and one “usual”. Since the labor force approach was used for the first time in that year, a comprehensive pilot test by BPS, in close cooperation with the Department of Manpower (DOM) and the ILO preceded implementation of the survey. The survey was then conducted in 1977 and 1978, and was designed to obtain serial data to be linked with data from Susenas, population censuses and

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Supas. It was stopped for a few years and was then resumed annually until 1985.

Beginning in 1986, the survey was conducted quarterly (in February, May, August and November) to capture the seasonal fluctuations in employment. With an economy still predominantly agricultural, employment was believed to be greatly influenced by agricultural seasons. It was believed that sectoral employment and other related characteristics would depict the peak and trough seasons in agriculture. The sample was approximately 20,500 households every quarter in 1992. Quarterly estimates were merged to produce average information for the year with a total sample of 82,000 households.

Quarterly surveys were conducted for 8 years until 1993. The results showed that seasonal fluctuations could not be clearly depicted by the quarterly national data, since agricultural seasons were different from region to region. Averaging at the national level tended to produce the same results for every quarter. Without a substantial increase in the sample which would allow the production of regional data, such quarterly surveys would not be useful. Average figures for the year from the quarterly survey were also not useful, since the average data had no time reference in the year. Another drawback of the quarterly version was the limited number of questions included: they were confined to seasonally affected items.

Accordingly, the quarterly survey was stopped and beginning in 1994 the survey was conducted yearly with a more detailed questionnaire. The total sample size was reduced to 65,500 households. In 1998 the sample was again reduced to 49,200 households due to budget constraints. Until 1999, Sakernas was conducted in August of every year.

b. Earnings Data

Only the 1976 and 1977 Sakernas collected *individual and household incomes*. Data on individual incomes were collected for household members working as *employees, own-account workers* and *employers*. For employees, incomes were in the form of wages and salaries, and for other workers incomes were estimated as production minus cost. Other incomes from renting out houses or land, and interest incomes were also collected in aggregate form from these individuals.

Household incomes from agriculture were collected for detailed agricultural sub-sectors in a separate block. But the incomes were simply estimated as the value of production minus costs. Income from non-agricultural households was not explicitly collected, but was already included in the individual household member's income.

Transfers of cash were collected from each household member. Such a method may have some strengths, but it may not be necessary since only a few household members are involved in such transfers. Items included under transfers are: pensions, cash receipts and payments, savings and withdrawals, and others (including lending and borrowing). Such transfer transactions are mixed up with *cash capital transactions*, since savings deposit and withdrawal, as well as lending

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and borrowing are not transfers but cash capital transactions. Moreover, pension, if paid by the company, must be included in income. In this survey fixed capital transactions were not collected.

Collection of earnings data was stopped in subsequent surveys, since such data were considered difficult to collect, and the data collected in 1976 and 1977 were believed to be unreliable. Starting in 1988, only wages and salaries were collected from those working as employees. These data were collected until 1999. No earnings data are collected from other workers, and no attempt is made to collect household earnings.

2. National Socio-Economic Survey (Susenas)

a. Data Collection

Susenas, a multi-purpose household survey, has a long history in BPS. The objective of the survey is to collect consumption and welfare statistics. Earnings data in Susenas are collected in support of that objective. Thus earnings data are available every three years along with consumption expenditure data.

The first Susenas was designed and launched in 1963 by the Statistical Research and Development Center (StRDC), a UN organization established to assist statistical development in BPS. After 1963, the survey was conducted regularly in 1964/65, 1967, 1969 and 1970 with samples between 16,000-24,000 households. The survey temporarily stopped in 1971 with the termination of StRDC, and resumed again in 1976 funded by the government.

In 1976, Susenas was conducted quarterly to collect detailed consumption expenditure data, and was repeated in 1978 to include more topics covering labor force and other demographic characteristics, socio-cultural and health, as well as consumption expenditure and income. The data on earnings in this survey were very much influenced by the 1976/77 Sakernas. In 1978/79 survey earnings were embodied in the block on employment. Since then, collection of earnings data was conducted consistently every three years together with consumption expenditure data.

In 1979 and 1980 the survey was conducted twice every year with samples between 54,000-102,000 households to accommodate new modules. In 1981 it was conducted quarterly again with questions on consumption expenditure and income. Labor and employment were included again in 1982 with a separate sample of 60,000 households. However, in the following year, the labor force module was taken out of Susenas and fully integrated with Sakemas. Consequently, the biannual Susenas in 1984 and the yearly Susenas in 1985-87 and 1989-91 did not contain any labor force module. Questions on earnings were included in the 1981, 1984, 1987 and 1990 surveys.

Beginning in 1992, Susenas was organized into a new core and a module. Before 1992 the core questionnaire covered only five basic questions: four demographic and one on education. Welfare indicators are believed to be needed every year, since a large percentage of the population is still living below the poverty line. In 1992 the sample size for the core questions was 65,600

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households, which enabled estimation at national and provincial levels. From 1993 until recently it was enlarged to 202,000 households to enable estimation at the regency/municipality levels, while the sample size for the module was 65,600 households all along. After the economic crisis in 1997, Susenas was redesigned to simplify its operation. Only three modules were included. Consumption expenditure is collected every three years together with earnings data. Thus earnings data exist in 1990, 1993, 1996 and most recently 1999.

b. Earnings Data

BPS collected earnings data in household surveys for the first time in the 1963/64 Susenas and the same data collection was repeated in 1964/65. Four different types of household income data were collected. These were wages and salaries from employee, income earned by employer or own-account worker (estimated as gross earnings minus labor cost, rent paid and maintenance/operational costs), household incomes earned from household production activities in agriculture, and farming of cattle and poultry, and from other sectors. Household incomes were collected in detail as sales value (collected from inventories) minus production costs (broken down into detailed direct and indirect costs) and other costs. To complete the picture on household earnings, data on transfers, cash receipts and payments were also collected. This included cash receipts, borrowing, lending, repayment of debts, contributions, gifts and others. Such data were informative, although their purpose was not clear and the questions were not exhaustive or systematic.

In the 1969 survey, household incomes were collected for different sub-sectors (including agriculture, fishery, manufacturing, trade, transportation, construction, services and others), but the income components were not systematically arranged in one block. Information on product inventory, cost of materials, other production costs, and labor costs were located in different blocks. For individual incomes, total wages and salaries paid in kind or in cash were collected in a separate block from employees working in different sectors, classified by one digit ISIC.

Another block on *cash transfers* was conceptually correct, but the items were mixed with capital account. Lending and borrowing, receipt of payment from debtors and repayment of debt are not transfers but cash capital transactions. *Cash capital flows* were collected in the finance block, consisting of withdrawals/savings in banks and post offices, use and savings at home, life insurance premiums, purchases and sales of stocks and bonds, and others. Another block was designed to collect data on *fixed capital transactions*, including land and building, and equipment, machinery, transportation, and other capital which were differentiated by whether they were used by the household or the establishment.

In the 1978/79 survey, non-agricultural incomes were collected as part of the *standard labor force* data collection. For each household member working, regardless of their status, their *net cash and in kind incomes* were collected for *main and additional jobs*. In addition *property*

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incomes from renting out houses and lands, and interest incomes were also collected in total on an individual basis. In a separate block household incomes from agriculture were collected for detailed agricultural sub-sectors, covering seasonal crops, cash crops, animal husbandry and poultry (including production of eggs and milk), cattle, fishery, hunting and forestry. But the income was simply estimated as value minus cost of production. Cash transfers were collected from each individual household member covering pension, cash receipts and payments, savings and withdrawals, and others (including lending and borrowing).

In the 1981 survey, income data were collected using the household schedule. In one separate block different components of wages and salaries were collected from each household member working as an employees. Profit and income from self-employment were not collected. A separate block was for data on net income from household establishments in agriculture, animal husbandry, fishery, forestry/hunting, trade, manufacturing, transportation, services, and others which were operationally active during the last month and the last three months. Other incomes were collected in one block with cash capital and transfer transactions. One further block was dedicated to collecting detailed agricultural income data, broken down by sub-sector (covering seasonal crops, cash crops, animal husbandry, poultry, fishery, forestry and hunting).

While in previous periods survey instruments for collecting earnings data changed, for the years 1984, 1987, 1990, 1993 and 1999, data were collected using exactly the same schedules. A separate block was used for collecting wages and salaries (broken down into basic wages and salaries, overtime, honoraria and others) as well as income in goods and services. Here again, profit and income from self-employment were not collected, but were included as dividends and other incomes. A new innovation was the disaggregation of other incomes into interest payments, land-rentals, building and equipment rentals, dividends, pension payments, scholarships, claims on life insurance policies, imputed house rentals and non-establishment income from agriculture and non-agriculture. However, pension and scholarships were incorrectly classified as other income.

Income from agricultural and non-agricultural households was collected with detailed sub-sectoral breakdowns. Sub-sectors of agricultural households included food crops (paddy, roots, nuts, vegetables, fruits), non-food crops (estate and non-estate), animal husbandry (cattle and other products, poultry and other products, other animal husbandry), fishery and forestry/hunting, while the sub-sectors for non-agricultural households were manufacturing/cottage industry, trade, transportation, services, and others. Income was estimated as value minus cost of production. Production was collected in detail based on the inventory method, but costs were not disaggregated.

Transfer transactions were correctly put into one account in a separate block including cash received and sent, inheritance, and a total for contributions, gifts and other assistance. Another separate block covered fixed capital (purchase and sale of stocks, gold and jewelry, land

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and buildings, and durable goods) and cash capital transactions (saving and saving withdrawals, non-life insurance claims and payments of premium, lending/borrowing and repayment of credits and debts, pawning and withdrawal of household durables, payment and receipt of *arisan* and others).

Among the more recent Susenas surveys, only in 1996 was income collected differently. Wages and salaries were collected from employees, by one digit ISIC and one digit ISCO. The components of income were different: housing accommodation was separated from wages and salaries given in kind. Household establishment income (value minus cost of production and depreciation) in agriculture and non-agriculture was collected in one block for *each household member* broken down by three digit ISIC and one digit ISCO. On the other hand, other incomes (net interest, dividends, royalty, housing rents, imputed own housing rents, land rents, production sharing) were collected on a *household basis*, and the components were not complete.

3. Producer Price Survey of Farmers

Following a study in 1993 for improving the weighting for farmers' terms of trade, a monthly survey was conducted to collect information on prices of commodities bought and sold by farmers. Prices of commodities and services bought by farmers are *prices paid*, while prices of commodities and services sold by farmers are *received prices*. The ratio of received prices over paid prices constitutes the farmers' terms of trade, indicating whether farmers are better-off or worse-off because of price changes.

Wages paid for the use of farm labor constitute one item in the prices paid by farmers. These wage data are collected in the context of the producer price survey of farmers, which is limited only to food crop farmers. Although wage data are collected for the computation of farmers' terms of trade, they are published separately as farm labor wages in rural areas. The objective was to continuously monitor the wage condition of farm labor for different types of agricultural jobs in the food crop sub-sectors. These jobs include hoeing, ploughing, planting, weeding and harvesting. Other jobs, such as taking care of plants or drying are not covered.

The survey is conducted in all provinces except DKI, but only data from 14 provinces are of acceptable quality and publishable. For wage indicators, only three types of jobs (hoeing, planting, and weeding) commonly performed by agricultural labor in the food crop sub-sector are used and published.

B. Establishment Surveys

BPS conducts several establishment surveys containing data on employment and income. Understandably, most establishment surveys collect data on production costs, input and output structure, capital formation, as well as information on business operations. Employment cost is usually obtained as part of the information on cost structure. As these surveys collect

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establishment data, only cost accounting and related economic data related to the establishment itself are provided. Data on individual workers and their earnings cannot be obtained; only data on groups of workers (e.g. classified by gender, type of work, and education) may be available. BPS establishment surveys containing earnings data include: the *Large and Medium Manufacturing Survey* (Survei Industri Besar-Sedang, SIBS), the *Small and Household Establishment Integrated Survey* (Survei Usaha Terintegrasi, SUSI), the *Employee Wage Survey* (Survey Upah Buruh, SUB), and the *Estate Employee Wage Survey* (Survei Upah Karyawan Perkebunan, SUKP)

1. Large and Medium Manufacturing Survey (SIBS)

This survey is routinely conducted every year. Given the importance of this sector in the Indonesian economy, detailed information is collected on cost of production, outputs and services performed, power generation, investment, capital and assets. As part of production costs, expenditure for employees are also collected with a breakdown by production and non-production workers. Components of expenditures include wages/salaries, pension contributions, insurance and other allowances. A separate block on employment includes a breakdown of the number of employees by gender, education (science, technical or others) and type of job (research and development, production engineering and others and working as researcher, technician, administrative staff, factory workers).

The survey covers all large and medium manufacturing establishments. The coverage depends a great deal on the completeness of the directory, which is updated regularly to add new establishments and remove those that closed down. A new system of directory updating was applied for Java in 1991 and outside Java in 1992. It checks the list of establishments with recent sources from other departments, and the unmatched establishments are checked in the field to make sure they exist.

The survey produces information for smaller sub-sectors up to the five-digit ISIC level. The response rate is about 85-90 percent. Given the large number of establishments and the long questionnaire, publication lags considerably behind. The 1997 data, for example, were only available in March 1999.

Since 1994, data on the number of employees are classified by education, production workers/non-production workers, and gender, but labor costs paid by the establishment are only divided into payments for production or non-production workers. The labor cost components are: wages and salaries, overtime, gifts, bonuses, pension contributions, social contributions, insurance and other similar benefits, and accident allowances, broken down whether paid in cash or in kind.

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2. Small and Cottage Household Integrated Survey (SUSI)

Following the implementation of the 1996 Economic Census, SUSI was conducted for the first time in December 1998 using the establishment list from the Census. As part of the Census activities, SUSI only collected indicators from “unincorporated” non-agricultural establishments which are mostly small and micro enterprises. However, some medium establishments may be “unincorporated” and thus would have to be included in SUSI. In budget years 1999/2000 and 2000, SUSI was implemented quarterly in the months of July and October in 1999 and in January and April of 2000. To get a serial picture, 50 percent of the sample from the previous survey was retained in the following survey.

This survey is different from other household establishment surveys. In other surveys both household income and income of the establishment are collected. In SUSI only income of the establishment is collected, since this survey considers the establishment as the unit of enumeration. Accordingly SUSI collects detailed information on the establishment’s activities including cost structure, output, capital and sector of production. Data on employment are broken down by gender, age, education and technical skill, and data on earnings are computed as output minus inputs. Employees are broken down into three age groups (less than 10, 10-14 and 15 or above) and are divided by paid/unpaid, gender and education. Labor payments are collected as part of production costs and are broken down by wages and salaries, and other payments for overtime, bonus, gifts and others. In Susi, the sectoral classification is by 4-digit ISIC.

3. Employee Wage Survey (SUB)

This survey was first conducted in 1979 to collect detailed information on wage development and structure, including distribution by occupation. It does not cover all economic sectors, only non-oil and gas mining, manufacturing, hotels and land transportation. It was simplified in 1992 by dropping the question on wage by occupation. Consequently, only average and median wage of workers under the rank of supervisor were collected; and by dropping the land transportation sub-sector. The sample size was also reduced. The survey was conducted quarterly to enable monitoring of changes in wages. Three provinces (Bengkulu, East-Timor and Central-Sulawesi) were left out. For non-oil and gas mining only 35 establishments were included in the sample, while for the manufacturing industry 667 large and 342 medium establishments were included. Small establishments were not represented. Fieldwork was undertaken quarterly in March, June, September and December every year. Wage data collected were the payments to production workers lower than a supervisor. Wages were broken down by establishment size, gender, sub-sector and capital status (foreign, domestic, government owned). Chris Manning (May 1994) extensively outlined the importance of this survey to provide wage data, highlighted its weaknesses and suggested improvements in the survey.

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4. Estate Employee Wage Survey (SUKB)

This survey has been conducted since 1951 by mail covering only all state-owned estates. Information collected includes: number of workers, number of person-days worked, and total income of workers. Average wage per worker as well as per person-day worked is available. Data are collected twice a year, but published only once a year. This has caused a long delay in the availability of the first semester data.

C. Agricultural Census

The Agricultural Census was conducted in 1963, 1973, 1983 and most recently in 1993. In terms of employment, agriculture is the largest sector in the economy but the living standard of its workers is the lowest. With most agricultural activities still traditional and informal, several government programs were implemented to help develop this sector. The sector has a large number of sub-sectors as well as commodities produced. More than one hundred million households are involved in agricultural production in one way or another. Censuses covering this sector must, therefore, be able to capture all these activities. That is why the agricultural census was organized into several separate data collection phases aiming at capturing activities of the sub-sectors and covering areas important to government programs. The Census basically consists of two parts. First is the complete data collection covering agricultural establishments. The second part is the "sample census" of agricultural households, land-holding farmers and the "sub-sector of agricultural households".

1. Census of Agricultural Establishments

One activity in the agricultural census is the census of establishments engaged in *food crops and horticulture*. As part of their cost structure, wages and salaries and other income components are collected by type of employee. Similar earnings data are collected in other establishment censuses. The census of *big and small cattle establishments* collects data on number of employees (whether permanent or temporary workers) by gender and education. It also collects information about daily workers by number of days and man-days, as well as expenditure on employees (in money and in kind) given as wages and salaries, overtime, bonus, gift and others. Such employment data are collected in addition to information on cost structure, output, earnings, capital formation and land owned and used. Other establishment censuses cover establishments engaged in *industrial plantations, wild animal culture and nature tourism, forest exploitation* (Hak Pengelolaan Hutan, HPH), *wood collection* (Ijin Pengambilan Kayu, IPK) and *fishery*.

2. Census of Agricultural Households

Labor cost data in the census of agricultural households are broken down by number of man-days, and total wages and salaries are collected for each type of work: land

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preparation, seedling, planting, fertilizing, pest and weed control, taking care of plants, harvesting, post harvest activities, and others.

As part of the agricultural household sample census, the census of “people's estates” was conducted to collect data from all households engaged in the production of cash crops. Other sample censuses were also conducted, one of which covered agricultural households engaged in animal husbandry and forestry as well as land-holding farmers. Another was the sample census of agricultural household earnings (SSPRT) conducted as part of the 1993 agricultural census. This was the third such survey, the first one was conducted as part of the 1983 census and the second in 1990 as Survey Pendapatan Petani (SPP). This survey covers all households engaged in agriculture in all sub-sectors. Altogether there were 90,054 households enumerated in 1993, and employment related data covered only expenditures on wages and salaries.

During the 1993 agricultural census, a sample census on cost structure of agricultural households (Survey Struktur Ongkos Usaha Rumahtangga Pertanian, SSOURT) was also conducted. This was the third such survey, the first was conducted in during the 1983 census and the second was blended in the 1990 SPP. Labor costs (wages and salaries) were included as part of other costs collected in this survey.

With regards to income, two types of income were collected in the *sectoral agricultural household survey*, to enable estimation of the total income of agricultural households. The first consisted of incomes collected as part of the cost structure of the agricultural economic activities of the household. The second consisted of other incomes collected as part of household income.

In the survey of “people’s estates”, for example, the first type of income consists of labor cost paid by the household to workers doing different kinds of jobs in the household plantation. Such jobs are classified into: land preparation, seedling, planting, fertilizing, pest and weed control, plant maintenance, harvesting, post harvest activities, and others. Workers undertaking these jobs come from outside the household, or they may be family members working paid as workers in the household establishment. For each type of job, data are collected on man-days of unpaid workers, man-days of paid workers, and wages paid. This way average wage paid by household can be computed for each type of agricultural work. The second type of income is collected as household income, not as individual income, although some may consist of individual incomes accrued to individual household members. The incomes are earned from other *usaha* (i.e. “efforts”). These *usaha* are differentiated into different sub-sectors of agriculture (food crops, vegetables, fruits, ornamental plants, estate crops, poultry, fish culturing, fishery, forestry/hunting, and agricultural services) and non-agriculture (services, manufacturing industry, trade, transportation and others). Two types of income are collected: that earned as an employee and that earned as an employer.

Another survey conducted within the agricultural census is the *agricultural household earning survey*. The objective of this survey is to get “total earning” of agricultural households.

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Individual and household income from all sources is thus collected. The structure of questionnaire is basically similar to those used in Susenas, with more elaboration on agricultural income. Total wages and salaries are collected in the survey for each household member, and they are differentiated by whether they earned as employees of agricultural or non-agricultural sectors. Other earnings (including income from pensions, rents, interest, dividends and others) are also collected for all household members as a group. The questionnaire contains blocks to collect data on transfers and cash capital transactions.

IV. STRENGTHS AND WEAKNESSES OF EARNINGS DATA

A. Household Surveys

Since 1986, Sakernas has collected only wages and salaries from employees. Its objective was not to collect household income with all its different components, but only to collect wages and salaries to be used as employment indicators. Its most significant strength is the fact that it collects data on wages and salaries which are fully incorporated with detailed employment data, thus allowing users to conduct elaborate analyses of different aspects of employment. One big weakness, however, lies in its coverage of employment status. Employees are often mixed up with the self-employed. The current survey deliberately included farm labor as employees, which should be more appropriately classified as self-employed. Moreover, since practically everybody working independently for pay in the informal sector considers himself as *buruh* (i.e. “employee”), the true number of “employees” is overestimated. Data collected on total wages and salaries also cover not only formal wages and salaries paid by employers, but also various earnings from different types of temporary and ad-hoc jobs. Accordingly, wage data here may underestimate the true wage levels.

As for Susenas, its overwhelming strength is its explicit collection of detailed household income data, even if undertaken only once every three years. No other single survey provides such detail on value and cost of production. In some cases, detailed classifications of incomes were possible (e.g. by sector and/or occupation, such as in the 1969 and 1978/79 surveys, or by sector, as in the 1981 survey) while in others, e.g. the 1996 survey, a detailed sectoral and occupation breakdown of wages/salaries was available. Another strength of Susenas earnings data is that it allows the possibility of conducting rich analyses connecting income with expenditure and employment data, as well as demographic and socio-cultural data contained in the modules.

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One big drawback, however, is the constant changes to the questionnaire making it difficult to undertake inter-temporal analyses of particular types of incomes.¹ It may still be possible to compare one particular type of income over time. However, broader categories, such as incomes from working (services incomes), property income, total individual income, and total household income, are not comparable for long periods. For instance, services incomes are completely collected from workers of different working status in the 1963/64, 1964/65 and 1969 surveys, but in other surveys only employee income is collected; incomes from self-employment and employers are left out, or collected in the wrong category.

Another weakness is the separation of different components of income into different blocks, resulting in *ad hoc* coverage of these components rather than an exhaustive systematic one. In the 1969 survey, for instance, the separation of different values and costs of production into different blocks may invite interpretations influenced by the corresponding blocks, resulting in inaccurate estimates of income. Moreover, this may also lead to a lack of exhaustive coverage of a particular income category: some components may be left out, some important components may be included in "others".

Another serious weakness is the mix up of individual and household income categories, as well as between different types of individual incomes. For best results, individual incomes should be provided on an individual basis and household incomes on a household basis. But, in the 1978/79 survey, for instance, net incomes of households engaged in non-agricultural activities were considered as individual incomes. Also in the 1996 survey, incomes from household establishments in agriculture and non-agriculture were collected in one block accrued to individuals and were estimated from value minus cost production and depreciation. Service incomes in the 1984, 1987, 1990, 1993 and 1999 surveys were collected in the block for property incomes.

Another general drawback is the mis-classification of different transactions in the different accounts. For example, in the 1981 survey, other incomes were collected in one block with cash capital and transfer transactions. This mixup of all three types of transactions is confusing and makes it more difficult to provide an exhaustive list of items for each type of transaction..

¹ Some changes in the questionnaire indicate a basic conceptual misunderstanding of how certain items should be interpreted. For example, cash received from scholarships is correctly classified as "cash transfer" in the 1984 schedule, but in the 1999 schedule it is considered as "other income". The 1999 schedule also classifies claims of loss, accident and health insurance as "other income", which is not correct. Such a classification would be correct if the premium is paid by the company; otherwise, it must be included in the cash capital account together with claims on own life insurance, while claims on other person life insurance should be classified as cash transfers. These transactions on insurance were not included in the previous schedules

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B. Establishment Surveys

The strength of earnings data from SIBS is the breakdown of information into smaller sub-sectors of the manufacturing sector, up to the five-digit ISIC level, making it possible to evaluate workers incomes for these sub-sectors. Its major weakness, however, is the long lag in data availability. Given the large number of establishments and the long questionnaire, publication lags considerably behind. The 1997 data, for example, were only available in March 1999. Since 1994, data on the number of employees has been classified by education, production/non-production workers and gender. But since labor costs paid by the establishment are only divided into payments for production and non-production workers, average wage per worker can only be estimated for these two categories of workers. However, all labor cost components (wages and salaries, overtime, and gift, bonus, pension fund, social contribution, insurance and other similar benefits, and accident allowances) are differentiated by production/non-production workers and whether paid in cash or in kind. Therefore, a more detailed breakdown of wages per worker can be made.

In SUSI only income of the establishment is collected. Since this survey considers the establishment as the enumeration unit, no attempt is made to collect household income. As part of production cost, the number of employees (broken down by detailed classification) and labor costs (broken down by gender only) are also collected. Consequently, only wage per employee by gender can be computed. The biggest strength of this survey is in providing wage data up to the 4-digit ISIC level.

The Employee Wage Survey (SUB) is theoretically a potential source of wage data. Its extension to cover more sectors is a good development. For serial analysis these statistics are sufficient, but for sectoral comparison they suffer from incomparability of the groups represented in various sectors. Employees below the rank of supervisor are very likely not comparable between sectors. For further discussion on these wage data see Manning (1994) and Korns (1988). Similarly, a discussion of the Estate Employee Wage Survey is provided in Korns (1988). Here one can only mention that coverage of only government estates cannot be representative of development of the estate economy, although most estates are government owned.

C. 1993 Agricultural Census

Earnings data collected in the *agricultural establishment census* are limited to labor costs as part of the cost structure. The strength of earnings data here, is the break down of labor cost and employment into commodity group and different types of jobs: land preparation, seedling, planting, fertilizing, pest and weed control, taking care of plants, harvesting, post harvest activities and others. Accordingly average wage per worker or per man-month can be calculated in details.

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From the *household agricultural survey*, both individual and establishment income data are collected, with the objective of estimating household income. However, in a particular sub-sectoral survey, only agricultural household income of that sub-sector is collected in great detail. Household incomes from other agricultural sub-sectors and non-agricultural households are available separately but are not as reliable. Therefore, for sub-sectoral studies, the data are sufficiently accurate, but for sub-sectoral comparisons they tend to be inconsistent.

Other incomes such as contract and pension payments and transfer are also collected, but many other household/individual income items (such as, dividend, profit, interest and rents) are left out.

V. CONCLUSIONS & RECOMMENDATIONS

A. Conclusions

Based on the above discussion of coverage and collection of earnings data, the following points can be concluded.

Objectives of Earnings Data Collection. Earnings data collection has so far had two objectives: the first is to estimate total household income and the second to collect income data as employment indicators. Total household income is important for welfare analysis, and for explaining the source of funding for household consumption expenditure. Collecting total household income is a complicated task, since several components of income can accrue to each member of the household or to the household as a whole. Moreover, there are transfer, cash and fixed capital transactions related to incomes, which must be identified and correctly classified. Accordingly, questions and questionnaire used in the survey must be systematically organized.

Wages and Salaries. This is one of the most important types of income collected in household surveys. Wages and salaries accrued to individual household members working as employees seems to be less difficult to collect. All household surveys on employment collect these data using the same question. However, the type of questions, their order, the block containing them and the systematic arrangement of the whole questionnaire are different. In some Susenas and Sakernas surveys, they are collected as part of employment, using the flow of individual questions on employment data collection. In most other Susenas, wages and salaries are collected using household schedules containing a list of household members working as employees. Differences also exist in the components of wages and salaries. Some may include detailed questions on wages and salaries (e.g. whether in cash or in kind, bonuses, company paid pensions and other allowances) while others include only totals.

Labor cost. Labor cost per worker is not equivalent to wages/salaries per employee, but is more like the average spending per worker paid by the establishment. The reason is that several components, such as expenditure on uniforms, training and recreation, are considered as labor costs by the

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establishment, but are actually not received by workers as wages and salaries. Labor cost may be simply collected as a total, or by employment group with varying degrees of details.

Profit and Self-employment Income. These are the incomes of household members working as own-account workers and employers outside the household, which must be collected individually. They were excluded from Sakernas and most Susenas surveys. They were only included in the 1963/64, 1964/65 and 1969 Susenas. Therefore, conceptually household incomes based on Sakernas and recent Susenas surveys have been underestimated, especially since the number of self-employed and employers working outside the household is around one-third of total employment.

Agricultural Household Establishment Income. Data on this item were collected in detail in Susenas, as production minus cost. Production is accurately estimated using the inventory accounting method, while the cost of production is estimated from individual components. But in some cases only total production and total cost were collected (such as in the 1978/79 and 1981 Susenas), making the estimate of establishment net income very weak.

Non-agricultural Household Establishment Income. Only simple data are usually collected for the estimation of this income, much simpler than those collected for agricultural establishments. But in some cases (such as in the 1969 Susenas), estimation of this income was undertaken in detail. In the 1987 Susenas, similar to agricultural households, the production data were collected in detail but on the cost of production only total cost was collected.

Other Individual Incomes. These incomes were only casually collected in most household surveys. House rents may be well covered, but land rents and rents from other equipment rented out tend to be under-reported. Interest from saving deposits are probably mis-reported, since interest is not separately provided. Moreover, interest from lending activities is very likely not reported by respondents.

Household and Individual Income. In some surveys these were not correctly classified. In the 1996 Susenas, household establishment income was erroneously classified as individual income by asking each working household member about value and cost of production. In fact, the sector and occupation of these household members were classified according to the relevant 3-digit ISIC and one-digit ISCO.

Reference Period for Income. Different reference periods were usually used for different types of income. Wages and salaries are commonly collected for one month. Income of households engaged in agriculture can be collected for one year, one season, or three months depending on the type of agricultural activity. For non-agricultural establishments, data collection is usually based on a three-month reference period or even a one-month period for frequently produced outputs.

Sectoral Breakdown of Income. The sectoral breakdown of income data can be very simple (e.g. agriculture and non-agriculture), as in Susenas. But in most cases it is by one-digit ISIC. For the agricultural sector, detailed sub-sectoral breakdowns are often provided. In Large and Medium Manufacturing, sub-sectors are broken down to the 5-digit ISIC.

Occupational Breakdown. In the 1996 Susenas, income is broken down by one-digit ISCO, but many other sources have no occupational breakdown at all. In

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agricultural survey, data on wage/salaries are broken down for different types of agricultural jobs.

Other Classification of workers. In establishment surveys, labor cost is often broken down for groups of employment, according to temporary or permanent workers, gender, age groups, education and type of work. Somewhat detailed classifications are found in SIBS and the Agricultural Census.

Transfer and Capital Accounts. These transactions are mixed up almost in all Susenas. In some cases, they are also mixed with property income, such as rent and interest. In most surveys, transfers and cash capital transactions are not systematically put in one account, making separation of the two accounts difficult. The accounts become even more complicated when property income is also included in the same account as in the 1981 Susenas. Moreover, items included in each account are not complete. Many of the important items are put in the category called "others". The treatment of payments for pension, life insurance, accidental insurance and insurance against damage or loss is not consistent.

Component Income Block Arrangement. Even with the apparent confusing treatment of components of the transfer and capital accounts, the arrangement of blocks to collect individual and household income data in some Susenas surveys remains good. But in some cases, that arrangement is not well ordered, and components of income are separated into different blocks and mixed with other items. This leaves room for misinterpretation of income items and may result in inaccurate data.

Earnings Concept. The concept of earnings must be carefully examined. It is usually calculated as the difference between total value of production and total cost of production, which is based purely on cash transactions. It is more appropriate to divide earnings into two components: earnings in cash and potential earnings. The former component can be computed as the value of production sold and used for own consumption minus the cost of production of sold goods only. Production still in inventory should not be included in the cash calculation. In some cases production given to other parties must be considered as a cost, if it is required for the operation of the establishment.

B. Recommendations

It is not the purpose of this report to provide detailed recommendations on the collection of all earnings data in BPS. Detailed recommendations can be provided in the future following a review of earnings data in a particular type of survey. Rather, the report will provide three broad suggestions, which should help BPS improve the quality of earnings data:

Make Susenas questions, their order and the block in which they are placed as uniform as possible in order to avoid any unnecessary inconsistency. Conceptually all items related to income must be valid and complete to arrive at a correct estimate of household income. For this purpose, the 1999 Susenas questionnaire can be used as the base, and with some improvements can be adopted as the standard questionnaire for subsequent Susenas surveys.

Strictly stick to the basic concept of "employee". Wages/salaries are important employment and welfare indicators. Papanek (November 1999) explains in great

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detail the strengths of wages as indicators measuring the impact of the crisis. For such indicators to be useful, they must be accurate and conceptually comparable among different surveys. Wages/salaries are relatively not difficult to collect. However, the accuracy of wages/salaries data depends a great deal on the category of workers considered as “employees”. Any low skill blue collar worker doing any odd job may consider himself a “buruh” (employee) and consequently any payment received for such jobs is classified as “upah” (wages). In Sakernas farm labor (mostly self-employed) is deliberately included in the “employee” category. Therefore, two suggestions can be made to “clean up” this category:

- First, separate farm labor from the “employee” category and put it in a separate category,
- Secondly, take out other self-employment from the “employee” category by introducing self-employment income along with wages and salaries.

Divide labor cost collected in establishment surveys into a wage and a non-wage component. In establishment surveys, labor cost is collected as part of production cost. Since establishment surveys provide an alternative means for collecting wage data to be compared with direct wage data collection (e.g. in the Employee Wage Survey and other household surveys), labor cost must also be directed toward wage/salaries data collection. This can be done simply by separating wage components in the labor cost from non-wage components. Expenditures on training, uniforms, and group recreation are considered labor costs by the establishment, but are not components of wages/salaries received by employees. In addition, to get richer data the employees and company spending must be broken down by some meaningful classification of workers, such as by sector, occupation, type of worker, and some socio-demographic breakdown.

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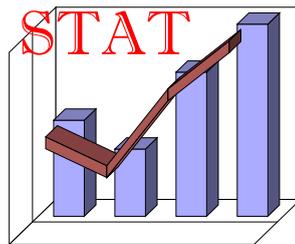
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REVISION OF QUARTERLY PRODUCTION ACCOUNTS

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by
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Revision of Quarterly Production Accounts

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Revision of Quarterly Production Accounts

I. INTRODUCTION

Data revision is an essential and integral part of the work of a statistical agency. Its aim is to provide more reliable data by maximizing the use of relevant information. This applies particularly to data produced under tight deadlines, such as monthly or quarterly figures, which force reliance on partial information. As more complete data become accessible, information which had been previously missed or guessed need to be incorporated and may necessitate a revision of earlier estimates. While in principle this may seem self-evident, in reality complications do arise.

Let us first look at it from the user's perspective. If a user witnesses substantial and frequent revisions with potentially different policy implications, he might understandably question the reliability of the methods used by the data producer for estimating and/or for collecting data. On the other hand, if he witnesses only small revisions between initial estimates (which presumably may be based on guesswork) and final figures (which presumably are based on more complete data), he might understandably suspect that even the final numbers are based on guesswork. Looking at it from the producer's perspective, substantial and frequent revisions, even when dictated by better and more complete data, carry the risk of projecting an image of incompetence. On the other hand, small revisions between initial and final figures carry a risk of succumbing to self-fulfilling projections.

From both perspectives, therefore, a balance needs to be struck where one expects a few revisions based on facts, some resulting in substantial changes and others in only minor changes. But one needs to keep in mind that as long as time is a binding constraint, revisions will be inevitable. Moreover, an evaluation of revisions can provide a useful tool for producers: it may indicate a systematic bias in initial estimates which can be remedied with adequate modifications to the estimation method. This paper addresses this particular issue. By focusing on a critical and widely used variable, the quarterly GDP, it evaluates the extent of published revisions and whether any lessons can be drawn from them to improve users' confidence in the data.

II. EXTENT OF GDP REVISIONS

A. Background

Efforts at estimating quarterly national accounts started in 1985 by applying a mathematical model to annual data.¹ Further refinements of the methodology were later

¹ "Perkiraan Produk Domestik Bruto Triwulanan Indonesia 1968-1983," BPS, December, 1985.

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introduced and applied to annual data through 1989.² It was not until about 1990 that a methodology based primarily on quarterly data was developed and that regular quarterly publications began.³

Since BPS started publishing quarterly National Accounts in 1991 its policy has been to provide preliminary estimates once enough usable data on all sub-sectors have been obtained. As more and better data are received, revisions are made and new numbers are published. Once data for four quarters of a particular calendar year are available, an initial estimate for the year is provided (a two-star label indicates that the numbers are “very preliminary”). A subsequent annual revision would then be given one star (indicating that the numbers are “preliminary”) before the final figures are provided without qualification. Once final figures are published, they are never changed.⁴

Between 1993 and 1998, the first estimates for a particular quarter were published after 6-8 months of the end of the reference quarter. It was not until the 1998 crisis that BPS attempted to follow to some extent a fixed time schedule for publishing various quarterly estimates:⁵

- For a particular quarter “i” of year “t”, the first estimate is provided two months after the end of quarter “i”.

- One revision is planned for quarter “i” two months after the end of quarter “i+1”, together with the first estimate for quarter “i+1”.

- Another revision is planned for quarter “i” two months after the end of quarter “i+2”, together with the first estimate for quarter “i+2” and one revision for quarter “i+1”.

- Another revision is planned for quarter “i” two months after the end of quarter “i+3”, together with the first estimate for quarter “i+3”, one revision for quarter “i+2” and one for quarter “i+1”. With estimates for all four quarters of year “t” available, the “very preliminary” estimate for the year is then published (with a “two-star” label).

² “Produk Domestik Bruto Triwulanan Indonesia, 1978-1983,” BPS, November, 1986 which was followed by “Pendapatan Nasional Indonesia Triwulanan, 1983-1989,” BPS, October, 1990.

³ Quarterly GDP figures were published in the monthly “Indikator Ekonomi” as well as a separate document entitled “Produk Domestik Bruto (PDB) Menurut Penggunaan Triwulanan”.

⁴ In July 1997, “Indikator Ekonomi” started publishing what it referred to as “very very preliminary” figures (with a three-star label) and the practice continues to date. A casual look at earlier issues of that bulletin suggests that such a qualification was applied to the 1994 figures but was discontinued with the 1995 and 1997 figures before being reinstated again starting with the 1997 figures.

⁵ We found no documented reference to this particular publication policy. It was based on discussions with officials of relevant BPS bureaus and divisions.

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- The same process continues into year “t+1”, at the end of which a revised “preliminary” estimate for the year is published (with a “one-star” label). The revision of the annual figure would presumably be based on new data obtained from sources allowing measurement of *levels*, rather than the previous quarterly data sources which were designed to measure *trends*. However, a revision of the annual level would require adjustment of the quarterly levels. A revision is then made to the quarterly figures.

- The same process continues into year “t+2”, at the end of which a revised “final” estimate for the year is published, again based on more complete annual data that would have been obtained. The quarterly figures would then be revised for the final time.

Table 1 illustrates the publication schedule according to that policy for the 1997-1999 period.

Table 1
Illustration of Quarterly GDP Publication Schedule 1997-1999

Release Date	Reference Period											
	1997				1998				1999			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
97:II	1st											
97:III	2nd	1st										
97:IV	3rd	2nd	1st									
98:I	***	***	***	***								
98:II					1st							
98:III					2nd	1st						
98:IV					3rd	2nd	1st					
99:I	**	*	*	*	***	***	***	***				
99:II									1st			
99:III									2nd	1st		
99:IV									3rd	2nd	1st	
00:I	final	final	final	final	*	*	*	*	***	***	***	***

Note: “1st”, “2nd” and “3rd” refer to the sequence of estimates for a particular quarter. “***” refers to estimates based on the annual revision labeled “very preliminary” and “*” refers to those based on the annual revision labeled “preliminary”.

According to this policy, therefore, first quarter estimates are usually subject to the largest number of revisions (five) while fourth quarter estimates are subject to the lowest (two). That policy also indicates that the final figures for a particular year (and its corresponding quarterly figures) will not be available until 26 months after the end of a particular calendar year. That is, by February 2000 the only final figures are those of 1997; and final 1998 figures are expected to be produced

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in February 2001.⁶

The lack of any explicit written statement of its publication policy, coupled with a lack of a strict adherence to it has contributed to the confusion of outside users. Confusion stems from inconsistencies that users had witnessed in the past: some quarterly figures undergo five revisions while others only show two; some quarterly figures are published with a two-month lag while others have longer lags; some quarterly figures are different even when the underlying annual figures show the same revision status; some “final” quarterly numbers were never explicitly published while others were⁷. The fact that BPS was apparently not forthcoming in fully clearing this issue has helped fuel suspicions that the numbers were “cooked” rather than being based on actual data. If one examines the figures presented in Table 2 below, for example, one might understand why some users may be cynical.

Table 2
Latest vs Earliest Estimates for Annual GDP At Constant Prices

GDP	Initial Estimate		Latest Estimate		Change
	Level	Announcement	Level	Announcement	
1996	413769	April 1997	413798	December 1998	0.01%
1997	433685	January 1998	433246	January 2000	-0.10%
1998	374719	February 1999	376893	July 2000	0.58%
1999	376903	February 2000	378052	July 2000	0.30%
Growth					
1996	7.82%		7.82%		0.00%
1997	4.65%		4.49%		-0.20%
1998	-13.68% ¹⁾		-13.01%		0.31%
1999	0.23% ²⁾		0.31%		0.08%

1) In July, 1998, an official announcement in BPS's newly created monthly bulletin (“Berita Resmi”) stated that the projected growth rate for 1998 was -13.06%. In the December, 1998 issue of that bulletin, the projected growth rate was -13.68%.

2) In April, 1999, an official announcement in “Berita Resmi” stated that the projected growth rate for 1999 was -1.02%. In the November, 1999 issue of that bulletin, the projected growth rate was 0.12%.

Sources: various issues of “Indikator Ekonomi”.

The fact that the final figure for 1996 was virtually the same as the initial one, or that the final

⁶ The May-July, 2000 issues of “Indikator Ekonomi” mistakenly indicated that the 1998 figures were final. They should have been given one star, as does the latest issue of “Produk Domestik Bruto (PDB) Menurut Penggunaan Triwulanan (Triwulan I/1996-I/2000).”

⁷ The latest numbers published in the May 1999 issue of “Indikator Ekonomi”, for example, indicate a “preliminary” status for figures for the first quarter of 1997. The following issues published “final” figures for only quarters 2 through 4. The same applies to figures for quarters 1 and 2 of 1996.

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1997 figure showed a difference of only 0.1% over the initial, understandably raise suspicions of whether the initial figures (which are presumably based on only partial information) actually undergo revisions which take into consideration more complete annual figures obtained at a later stage. Admittedly the most controversial figure relates to that of 1998. With only one-half of a historically unusual crisis year over, BPS announced its projection of a -13.06% growth for the year, and so far the latest available (“preliminary”) figure shows a growth of -13.01%. If the “final” growth rate remains at this level, it will suggest a tremendously accurate initial projection in the middle of serious turmoil (a difference of only 0.3%), which cannot be easily accepted by users.

User skepticism is certainly understandable and legitimate. The only reliable way to erase any suspicion, and thus increase user confidence in these numbers, is to ensure that the process of computation and revision is as transparent as possible. That, it is hoped, will be the policy adopted by BPS in its future releases. For now, we provide an attempt to suggest that Table 2, although based on hard evidence, does not fully reflect the reality which lies behind quarterly GDP revisions because it leaves some important facts out of the picture. In what follows we provide an alternative approach of evaluating the impact of revisions.

B. Methodology

Our attempt was to trace the process of revision of quarterly GDP estimates in order to determine their magnitude. Our aim was to examine, from a user’s perspective, whether revisions have been significant, and thus lend support to the plausibility of BPS’s declared policy (i.e. revisions based on more complete annual data), or whether they have been merely window dressing to placate curious outside users. To do that, we relied fully on published figures obtained by users (in various issues of “Indikator Ekonomi”), and used the 9-sector classification of the production accounts.

One of the shortcomings of the comparisons in Table 2 is that they compare *annual* figures which are characterized as “very preliminary” and “final”. By the time the “very preliminary” annual figure is published, quarterly figures for that year would have already undergone several revisions (three for the first quarter, two for the second quarter and one for the third quarter). So for one to truly measure the extent of revision of quarterly figures, one needs to trace all these revisions, not just compare what the annual figures characterize as “very preliminary”, “preliminary” and “final”.

Because of the time consuming nature of this exercise, we limited our investigation to the 1996-1999 period. We scanned all issues of “Indikator Ekonomi” with published quarterly figures for this period and extracted the very first estimate for a particular quarter which we labeled “initial”. We then searched for the last published figure for that quarter and labeled it “latest”. We then extracted three revisions in between and labeled them by sequence (e.g.

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“second”, “third”, “fourth” estimate). As mentioned above, some quarters have undergone more revisions than others. For the present exercise, data comparisons were limited to three revisions between the “initial” and “latest” estimates. The analysis was done for both current and constant price data.

C. Results

Tables 3 through 5 show the percentage changes between initial and latest estimates in constant price figures, current price figures and implicit GDP deflators respectively, and Figures 1-20 show some of the more interesting results. Individual quarterly estimates as well as detailed sequential changes are provided in Tables A.1 through A.6.

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Table 3
Percentage Change Between Latest and Initial Estimates of the Production Accounts
(In constant 1993 prices)

Year	Agricul.	Mining	Industry	EGW	Const.	Trade	Transp.	Finance	Services	GDP
1996	1.5%	-0.7%	-0.6%	1.4%	-2.4%	-0.2%	-0.4%	-5.3%	0.1%	-0.7%
1997	2.1%	0.8%	-0.2%	1.3%	4.2%	1.1%	-1.3%	-2.3%	0.4%	0.6%
1998 ¹	-2.1%	3.1%	5.0%	1.5%	1.8%	3.7%	-3.5%	0.5%	0.5%	1.7%
1999 ²	0.5%	-1.6%	1.9%	2.8%	5.0%	1.5%	-0.7%	7.1%	-0.7%	1.3%

1) The latest estimate for this year is still "preliminary"

2) The latest estimate for this year is still "very preliminary"

Source: Table A.2

Table 4
Percentage Change Between Latest and Initial Estimates of the Production Accounts
(In current 1993 prices)

Year	Agricul.	Mining	Industry	EGW	Const.	Trade	Transp.	Finance	Services	GDP
1996	3.0%	3.9%	2.5%	5.3%	-2.2%	-0.7%	-1.4%	-5.4%	-2.7%	0.4%
1997	0.9%	-4.9%	7.3%	3.1%	-2.9%	-4.1%	-9.0%	7.3%	3.5%	0.9%
1998 ¹	0.7%	7.5%	-4.7%	6.5%	17.1%	21.1%	-1.4%	-5.5%	29.3%	5.5%
1999 ²	0.0%	-4.7%	-4.6%	6.0%	10.2%	-0.3%	9.3%	4.6%	5.8%	0.1%

1) The latest estimate for this year is still "preliminary"

2) The latest estimate for this year is still "very preliminary"

Source: Table A.4

Table 5
Percentage Change Between Latest and Initial Estimates of the Implicit GDP Deflator

Year	Agricul.	Mining	Industry	EGW	Const.	Trade	Transp.	Finance	Services	GDP
1996	1.5%	4.6%	3.2%	3.8%	0.2%	-0.5%	-1.0%	0.0%	-2.8%	1.1%
1997	-1.2%	-5.6%	7.5%	1.7%	-6.9%	-5.1%	-7.8%	9.8%	3.1%	0.3%
1998 ¹	2.8%	4.2%	-9.3%	5.0%	15.0%	16.8%	2.1%	-6.0%	28.7%	3.7%
1999 ²	-0.5%	-3.1%	-6.4%	3.2%	4.9%	-1.8%	10.1%	-2.4%	6.5%	-1.2%

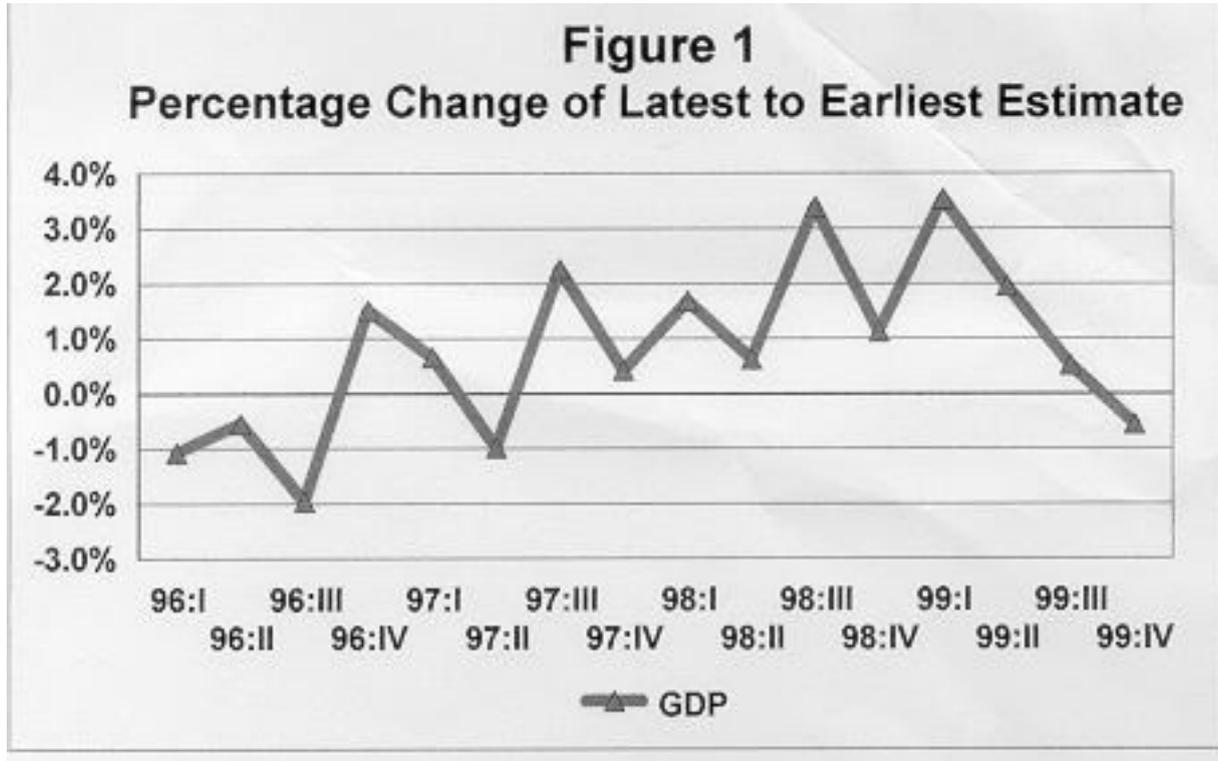
1) The latest estimate for this year is still "preliminary"

2) The latest estimate for this year is still "very preliminary"

Source: Table A.6

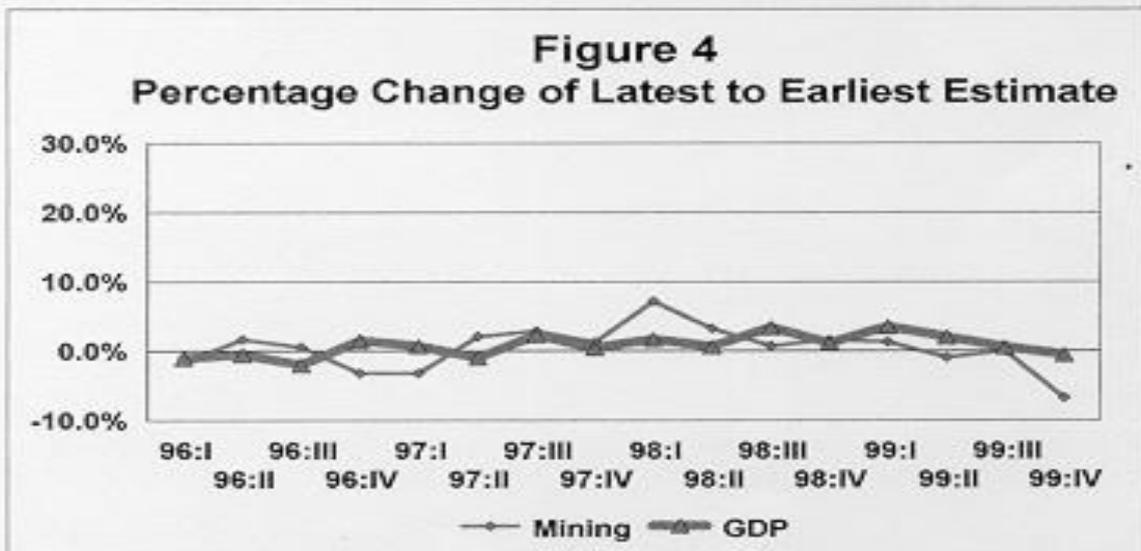
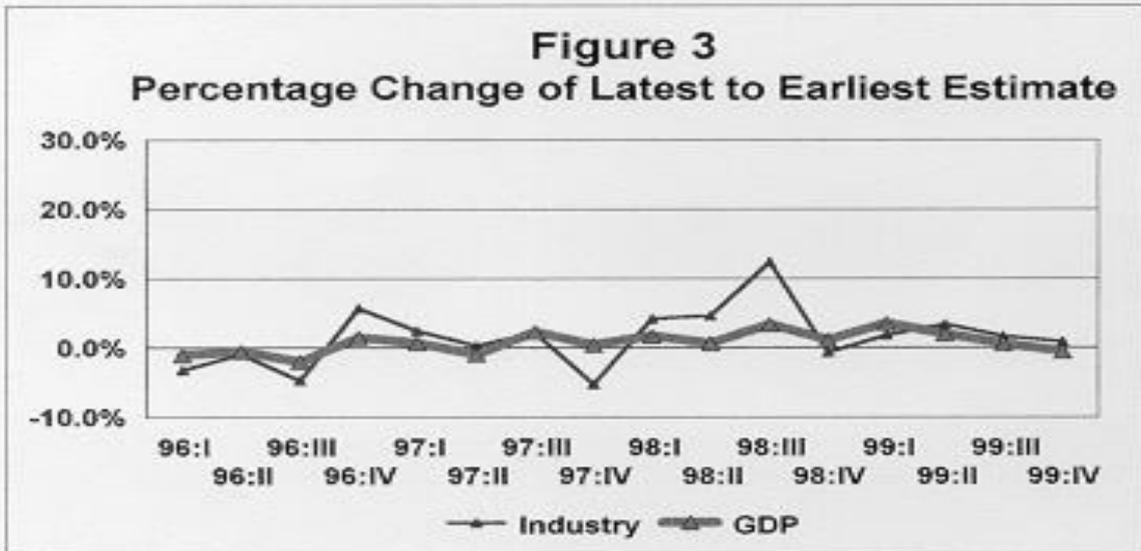
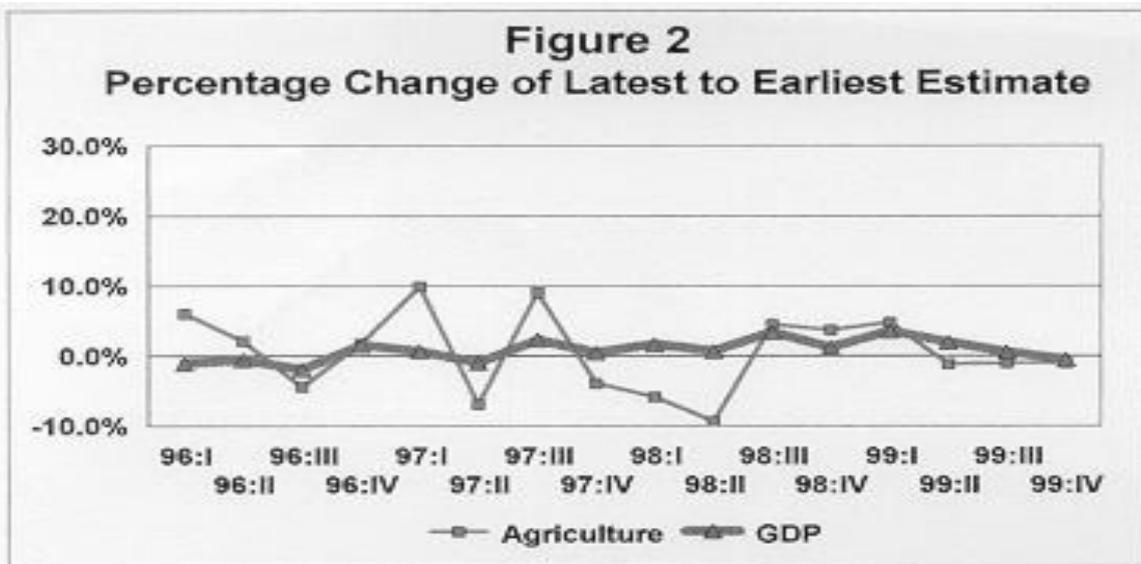
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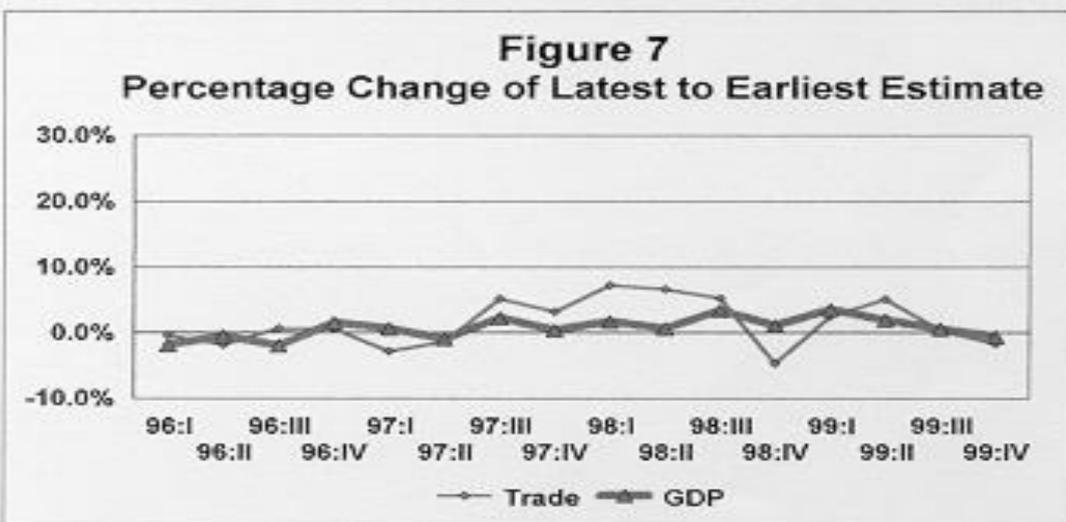
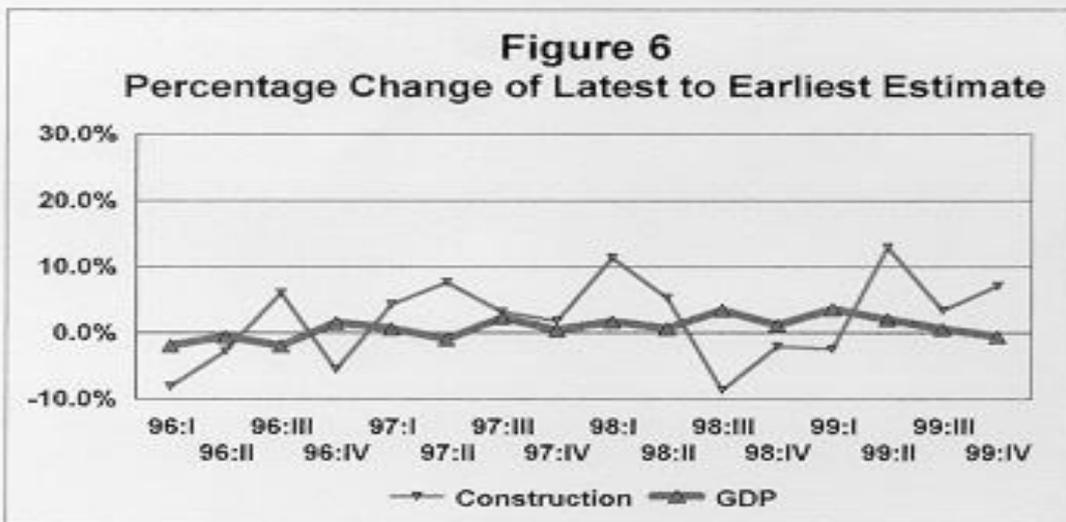
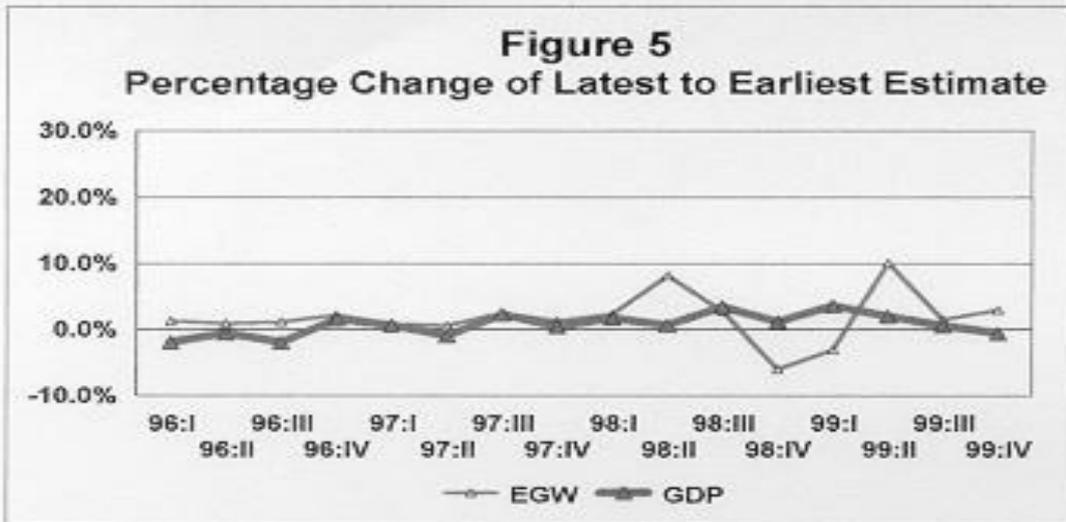
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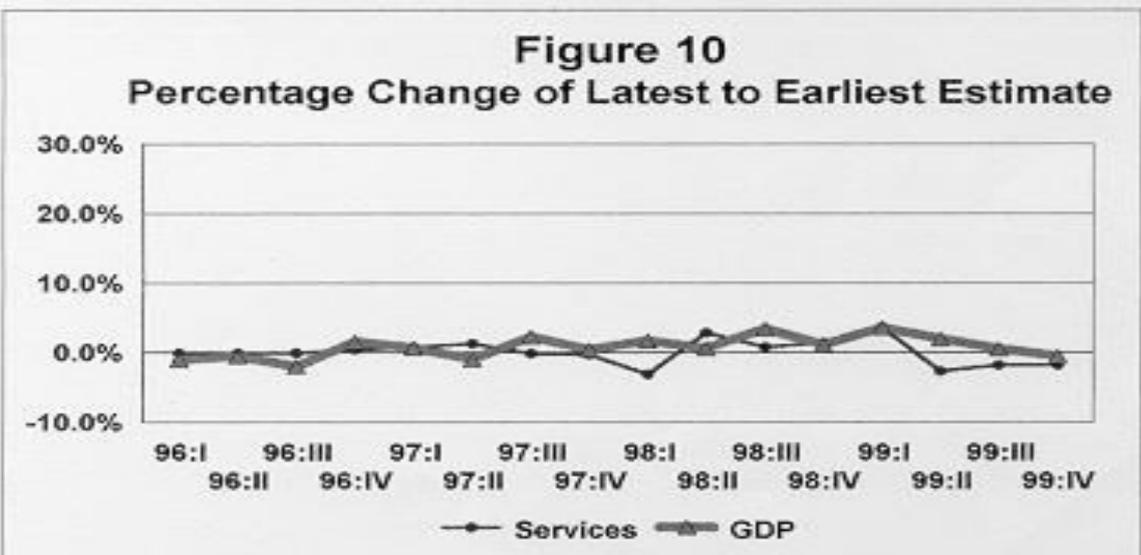
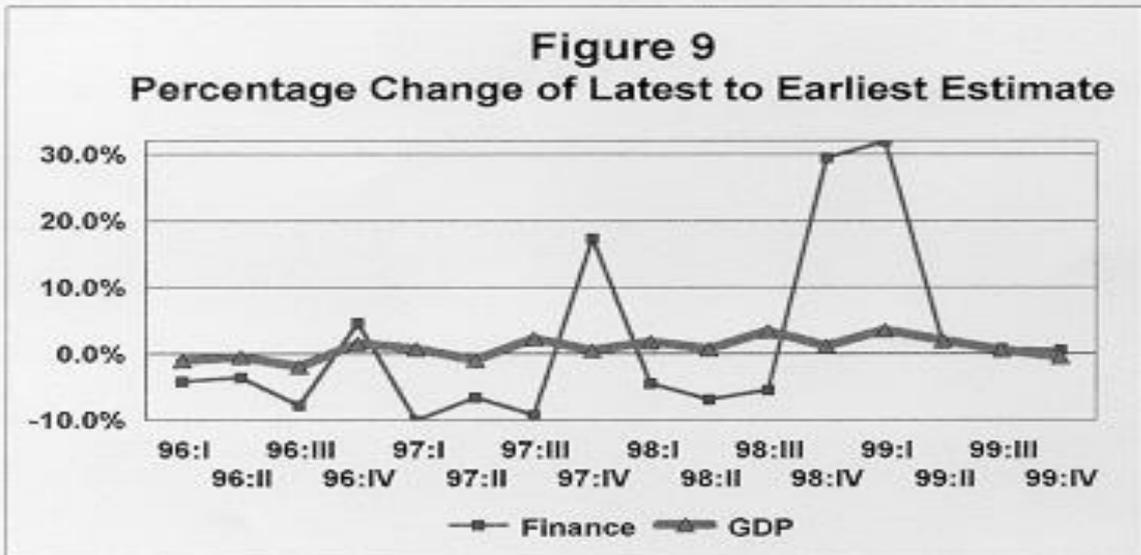
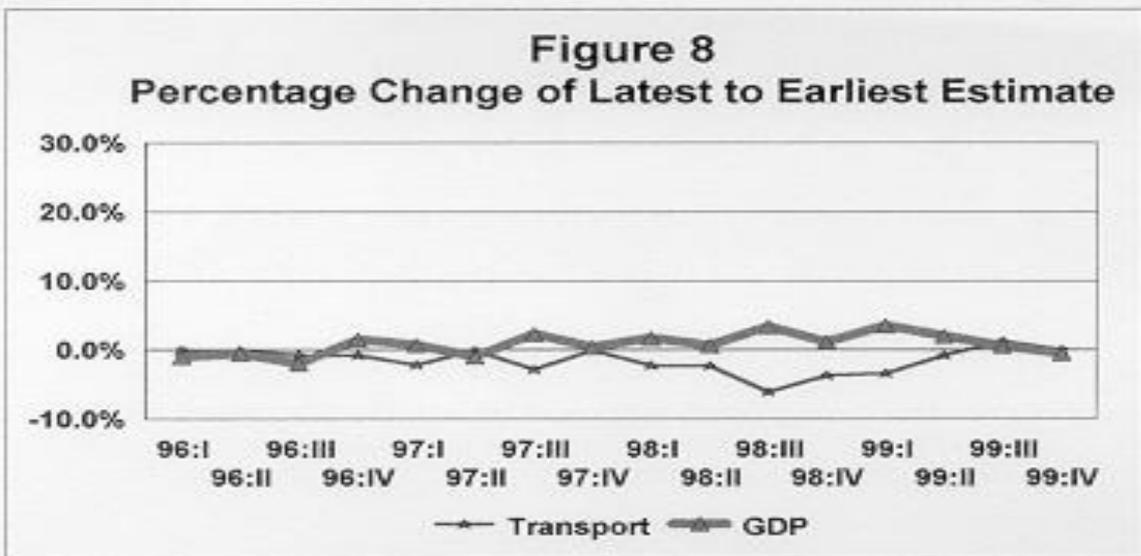


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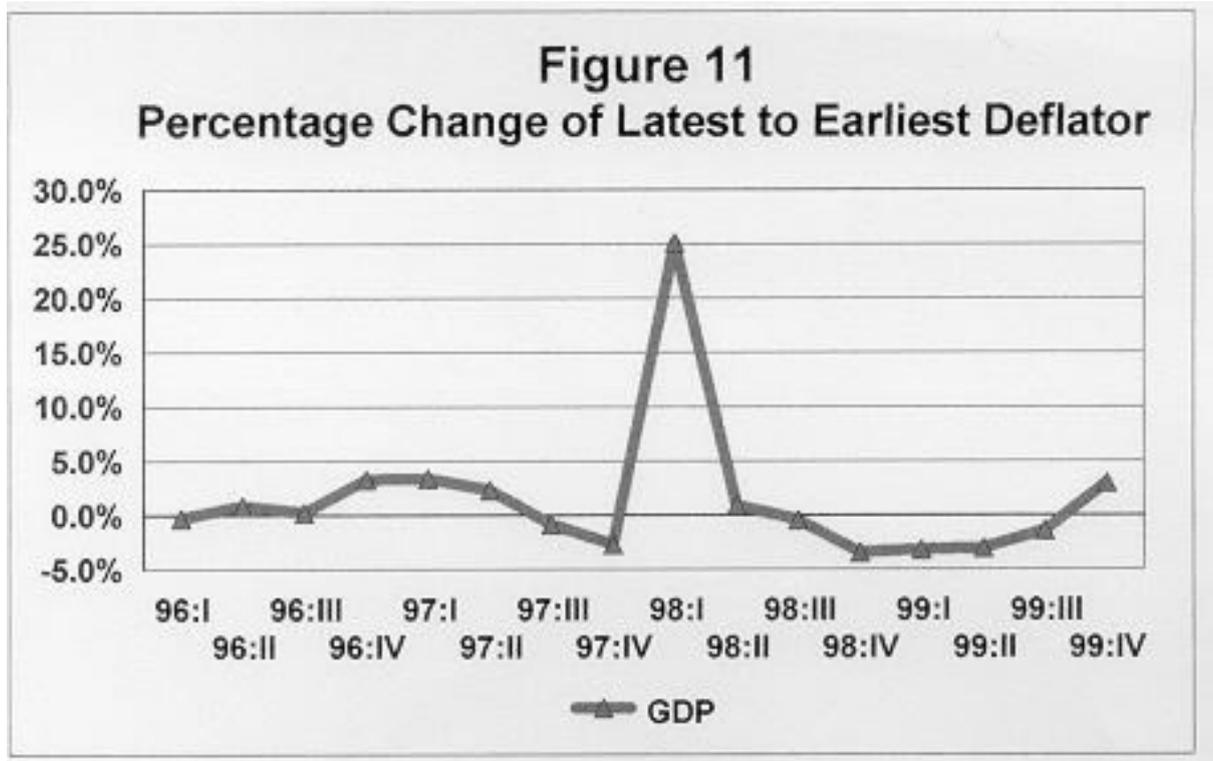






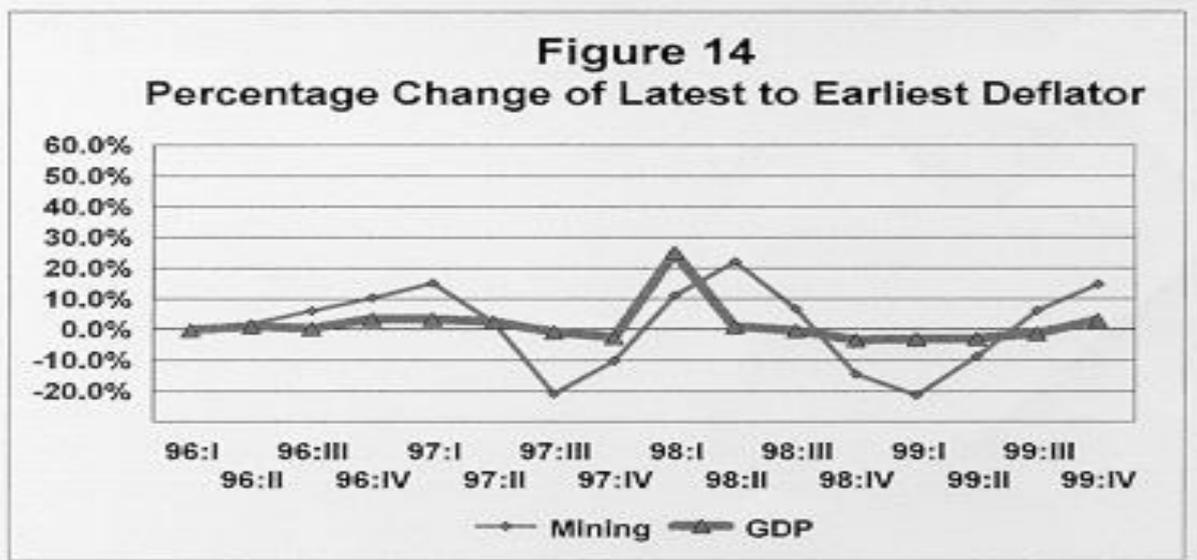
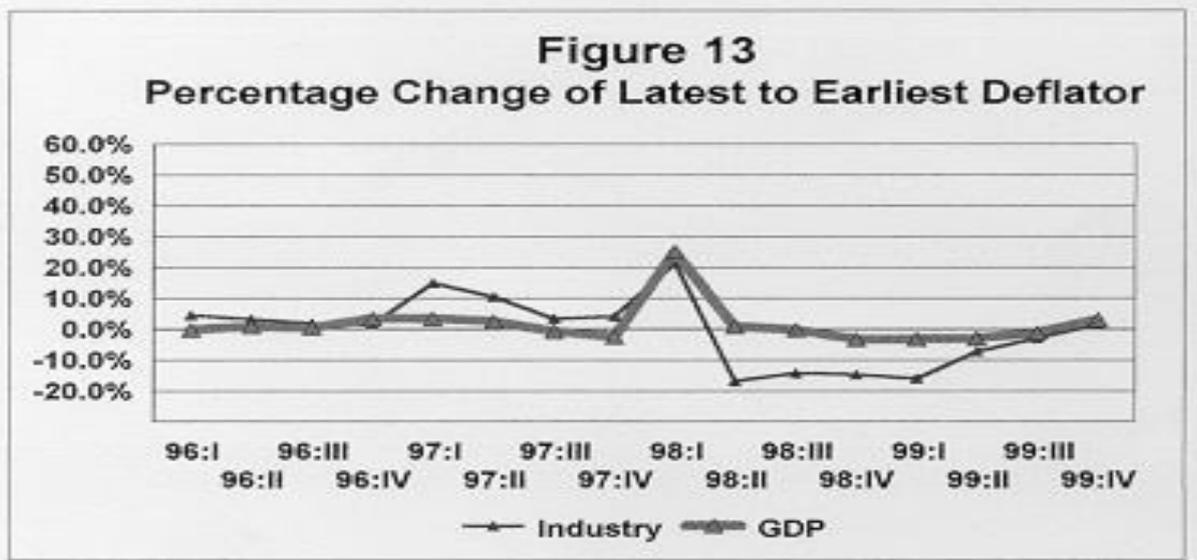
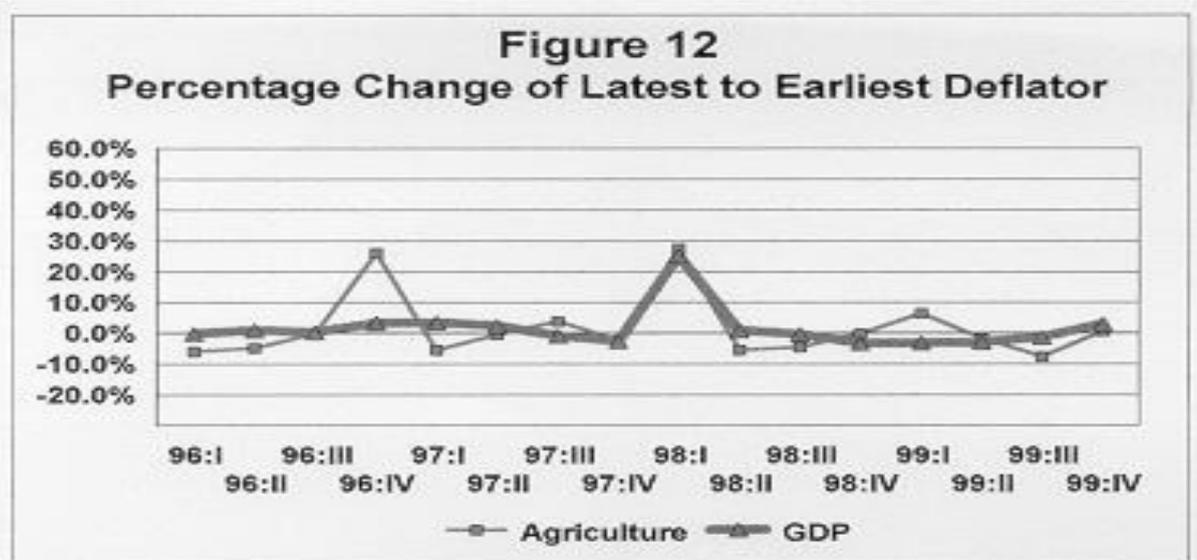
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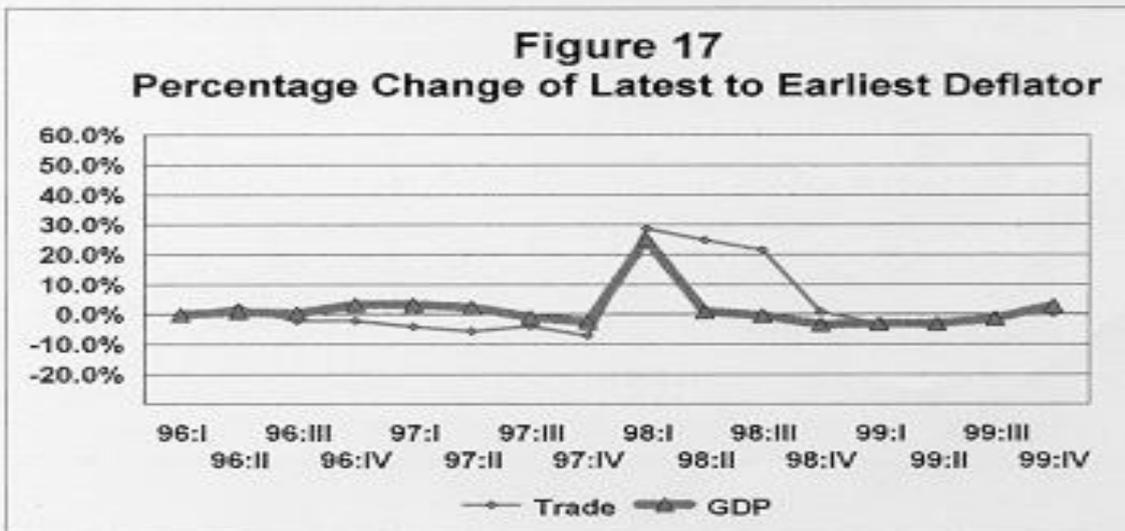
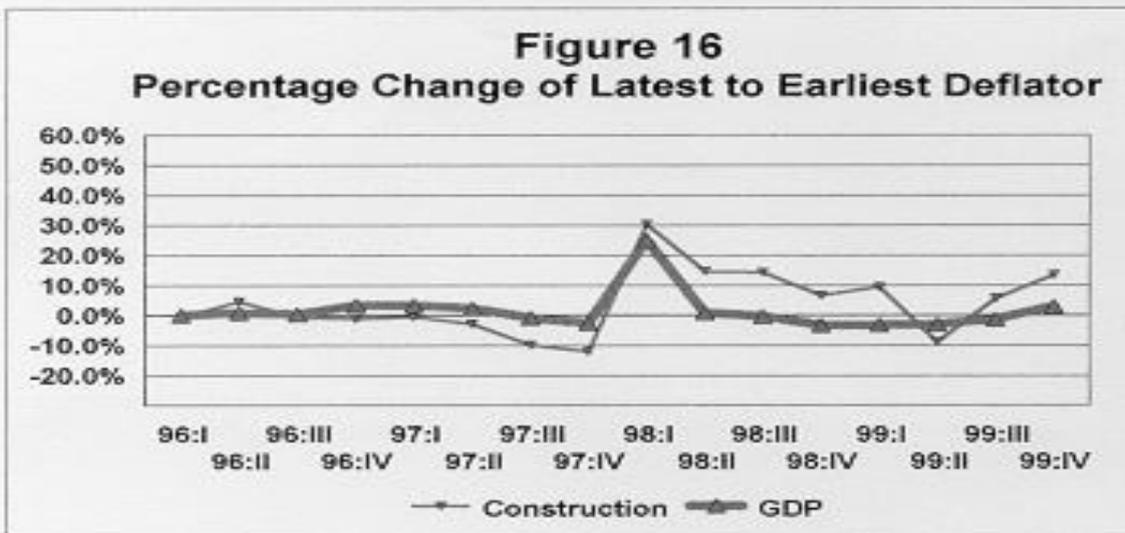
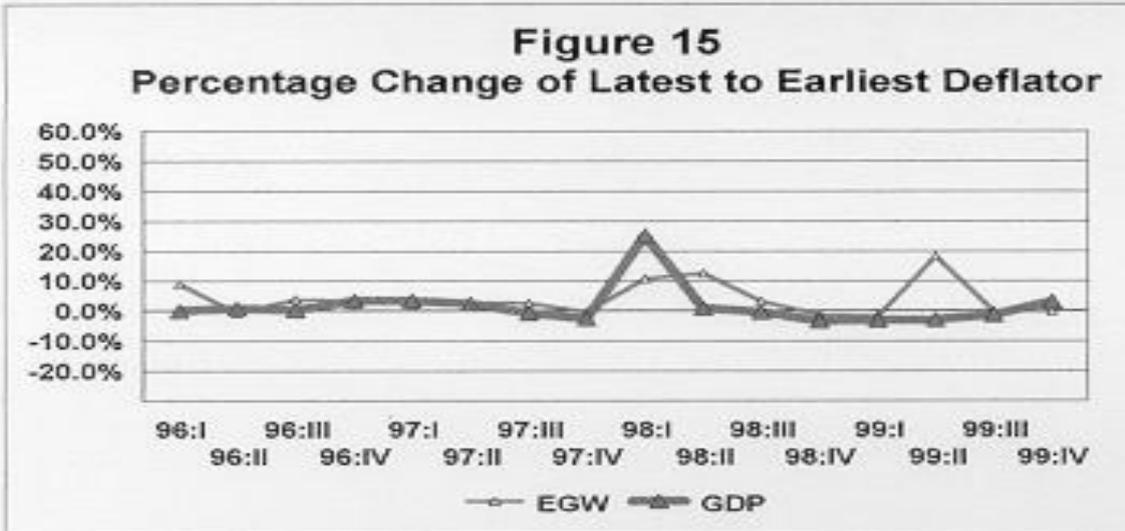
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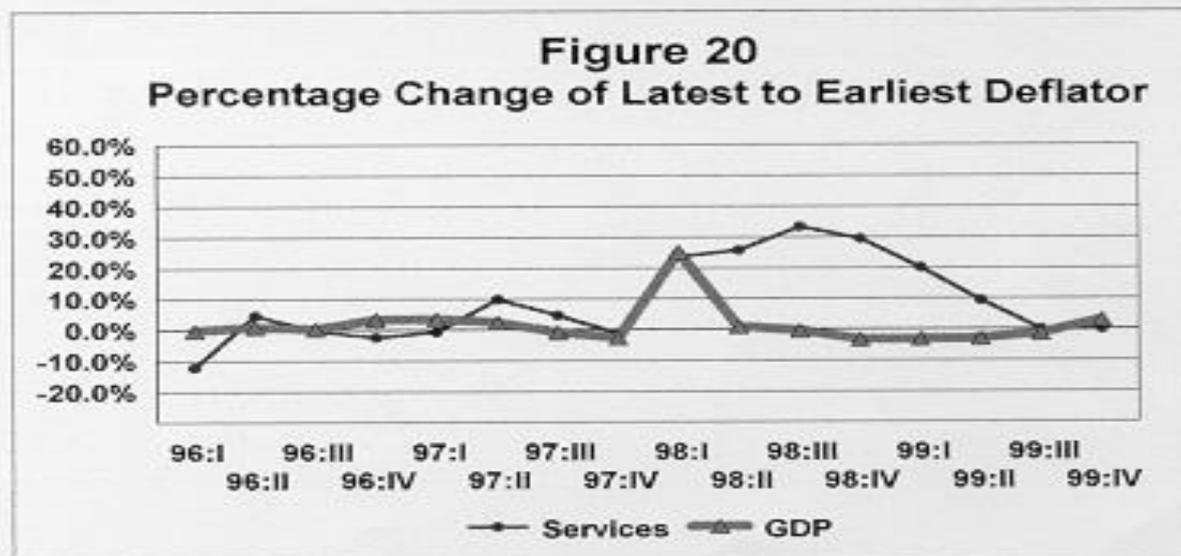
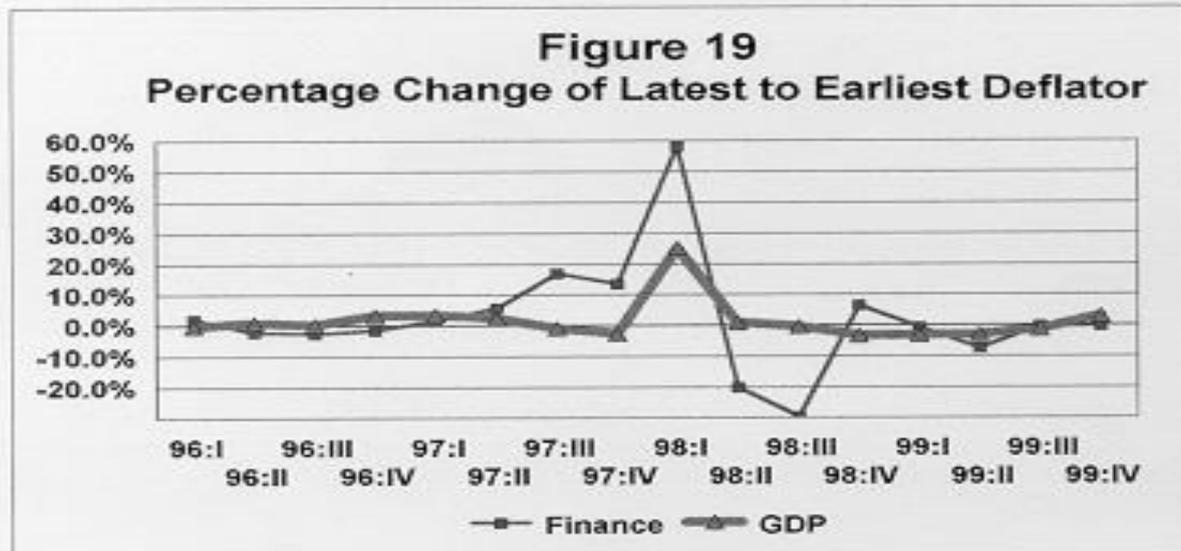
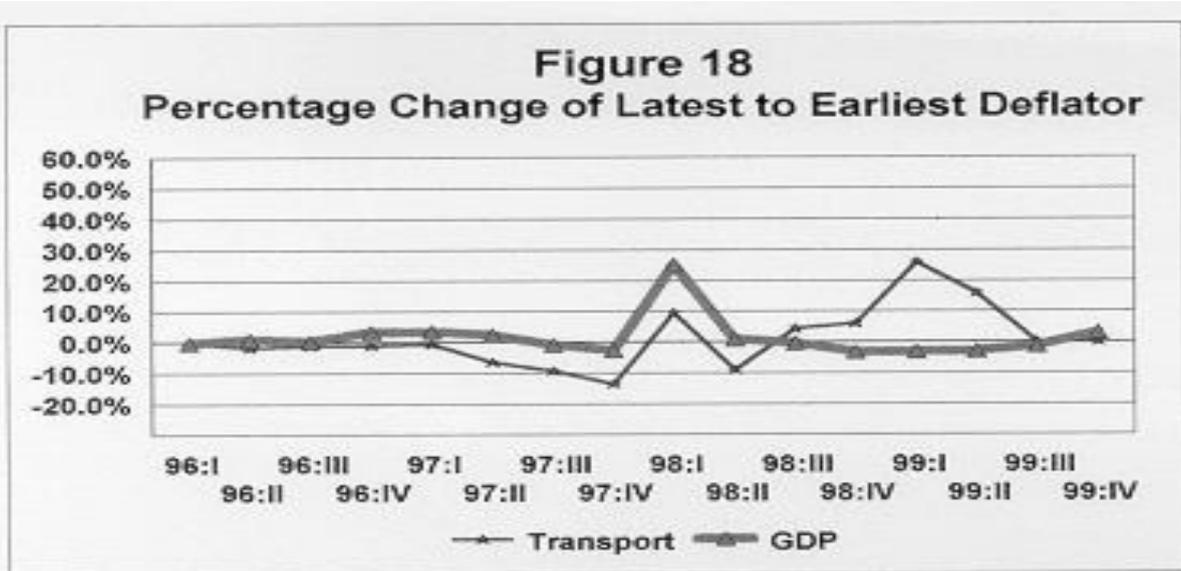
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Note the following:

- Quarterly revisions to real GDP result in significant changes: ranging from -2% for the third quarter of 1996 to 3.5% in the first quarter of 1999. However, resulting annual effects of these revisions are far less pronounced: -0.7% and 0.6% respectively for 1996 and 1997 (Table 3).
- Two thirds of revisions to total GDP, and all except one since the third quarter of 1997, have been upwards. In other words, the initial figure in these cases tended to consistently underestimate the final figure. That may indicate a systematic bias towards underestimation in the more recent years. However, given that the total GDP figure is actually computed from 58 underlying sub-sectoral figures, one needs to look into potential biases at the sub-sectoral level.
- At the sectoral level, ranges between initial and final estimates vary more widely: -10% to 10% for Agriculture, Industry, Electricity, Gas & Water and Construction; and -10% to 32% for Finance.
- While most sectors show the expected pattern of quarters of under-estimation and quarters of over-estimation, some exhibit systematic over-estimation or systematic under-estimation: e.g. Transport; Trade between the third quarter of 1997 and the second quarter of 1999.
- Some sectors show a change in pattern from no difference in estimates to a marked difference: e.g. Electricity, Gas & Water; Transport.
- The Finance sector exhibits the most striking behavior: it shows that the initial estimate had always over-estimated the final figure (by up to 10%), except in the fourth quarter of 1997 and the third and fourth quarters of 1998, when it over-estimated it by about 20%, 30% and 32% respectively.
- Some sectors show detectable deflation patterns: e.g. systematic over-estimation in Agriculture (with a couple of exceptions); systematic under-estimation in Industry before 1998, followed by systematic over-estimation after 1998; systematic under-estimation for services.

III. CONCLUSIONS & RECOMMENDATIONS

The above analysis points to two main conclusions:

- The first is that unlike the conclusion that one derives by only considering data provided in Table 2, quarterly revisions to total GDP, and particularly to its components, have not been insignificant.
- The second is that quarterly revisions in some sectors suggest a systematic under- or over-estimation of the final figures.

These points, as well as the analysis provided above, suggest that some concrete steps can be taken by BPS to increase user confidence in quarterly GDP figures by increasing transparency of its revision policy and improve the estimation methodology used. One such step is to:

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Recommendation 1: Publish a clear explicit policy regarding the timetable and the extent of quarterly as well as annual revisions to GDP data, and stick to it.

What should that policy be? To answer that question, it may be useful to know what other countries do. Table 6 provides a brief comparison of the publication and revision policy of quarterly GDP in selected countries (including Indonesia) as reported by the IMF.

Table 6
Comparison of Quarterly GDP Release Policy & Timing in Selected Countries

Country	Lag	Release Policy	# Releases
Indonesia	no later than 3 months ¹⁾	advance release calendar giving one quarter ahead notice of the approximate release dates, and updated monthly ¹⁾	NA ¹⁾
US	- "advance": 1 month - "preliminary": 2 months - "final": 3 months ²⁾	a schedule of release dates is issued in September of each year showing the precise release dates for the coming calendar year	"advance", "preliminary" & "final" ²⁾
Canada	- "preliminary": 2 months - "revised": 3 months ³⁾	precise release dates for the next 15 months are announced in November of each year	"preliminary" & "revised" ³⁾
Singapore	- "advance": 10 days - "preliminary": 9 weeks	a quarter-ahead advance release calendar showing the "no later than" release dates is published which is updated one week prior to the data release to show precise release dates.	"advance", "preliminary" ⁴⁾
Malaysia	60 days	one quarter ahead advance release calendar showing the no-later-than dates on which the data will be released.	NA
Thailand	3 months	advance release calendar giving one-quarter-ahead notice of precise release dates	NA
Korea	- within 2 months for GDP data at constant prices for the first 3 quarters. - within 3 months for the fourth quarter data on GDP at constant prices, GDP data at current prices for all 4 quarters, and the deflators.	advance release calendar which gives at least one-quarter-ahead notice of the approximate release dates, and at least one week ahead notice of precise release dates	NA

1) This is what is reported on the SDDS website (presumably submitted by Bank Indonesia, the IMF's counterpart). It is not fully consistent with the BPS policy discussed in Section II above.

2) Obtained from the US Bureau of Economic Analysis website.

3) Obtained from the Statistics Canada website.

4) Only "advance" and "preliminary" releases were mentioned. However, if a release was qualified as "preliminary", one expects that at least one more release would follow.

Sources: IMF's Standard Data Dissemination Standard (SDDS) website (<http://dsbb.imf.org/country.htm>).

Two points are particularly noteworthy:

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- If the Canadian and American release policies are typical of those of industrialized countries, then these countries limit the number of quarterly revisions to one (Canada) or two (US). This may be prompted by a desire to limit the processing burden of the statistical agency and the potential confusion of users. One or two revisions seem to provide an acceptable balance between user demands and producers' capacity to deliver.

- While other developing Asian countries provide a one-quarter advance release date for their quarterly GDP, the US and Canada provide a fixed release schedule for the whole year in advance. Such a policy aims at avoiding any perception of political interference with the numbers.

A lesson can, therefore, be learned from the US and Canadian experiences:

Recommendation 2: Evaluate the possibility of limiting the number of revisions of quarterly figures to one or two and publish in advance a fixed release schedule for a full calendar year.

Limiting the number of revisions will ease the burden on BPS and will reduce potential user confusion. Adherence to a timetable released in advance would void any potential suspicion of political manipulation of the figures.⁸

Another step that can be taken to increase user confidence in the data is to relay to them the fact that published figures are subject to some margin of error. One way to do that is to:

Recommendation 3: Publish more rounded figures for both levels and growth rates. This will have the added effect of simplifying presentation. Publishing growth rates with two decimals, as is the current practice, gives the misleading impression of a high level of precision.

Finally, the second conclusion stated above, namely the possibility of a systematic under- or over-estimation of the final figures, suggests one obvious action:

⁸ Such a move would eliminate the need for the multiple revisions of estimates for the first 3 quarters of the year (see Table 1). The release schedule for these quarters would be the same as that of the fourth quarter.

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Recommendation 4: Evaluate the methodology used in estimating initial figures in sectors where a possible bias occurs (e.g. Transport, Trade), and modify accordingly.

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APPENDIX A DETAILED TABLES

Table A.1
GDP At Constant Prices

	Agriculture	Mining	Industry	EGW	Construction	Trade	Transport	Finance	Services	GDP
96:I										
First	15,602	9,201	23,357	1,116	8,121	16,554	7,347	9,225	8,980	99,501
Second	15,602	9,102	22,656	1,116	7,530	16,354	7,399	8,974	8,980	97,713
Third	16,556	9,061	22,624	1,119	7,468	16,441	7,349	8,839	8,974	98,432
Fourth	16,556	9,061	22,624	1,119	7,468	16,441	7,349	8,839	8,974	98,432
Latest	16,674	9,063	22,624	1,131	7,468	16,492	7,349	7,813	8,974	97,587
96:II										
First	17,025	8,995	23,499	1,187	7,774	17,060	7,212	9,651	9,078	101,481
Second	17,025	9,138	22,568	1,195	7,428	16,661	7,263	9,450	9,078	100,204
Third	17,389	9,146	23,286	1,198	7,564	16,752	7,211	9,304	9,072	100,922
Fourth	17,389	9,146	23,286	1,198	7,564	16,752	7,211	9,304	9,072	100,922
Latest	17,389	9,146	23,286	1,198	7,564	16,752	7,211	9,304	9,072	100,922
96:III										
First	16,881	9,586	28,261	1,247	8,832	17,511	7,479	9,693	9,207	108,897
Second	16,116	9,643	26,949	1,253	9,368	17,604	7,426	9,543	9,202	107,103
Third	16,116	9,643	26,949	1,253	9,368	17,604	7,426	9,543	9,202	107,103
Fourth	16,141	9,644	26,949	1,262	9,368	17,630	7,426	8,940	9,202	106,562
Latest	16,141	9,644	26,949	1,262	9,368	17,630	7,426	8,940	9,202	106,562
96:IV										
First	13,380	10,207	27,798	1,258	9,621	18,489	7,773	9,865	9,322	107,106
Second	13,682	9,719	29,401	1,270	8,524	18,576	7,715	9,715	9,362	107,963
Third	13,682	9,719	29,401	1,270	8,524	18,576	7,715	9,715	9,362	107,963
Fourth	13,623	9,837	29,401	1,285	8,524	18,602	7,715	10,327	9,362	108,726
Latest	13,623	9,837	29,401	1,285	8,524	18,602	7,715	10,327	9,362	108,726
Annual 96										
First	62,888	37,989	102,915	4,809	33,748	69,604	29,811	38,435	36,586	416,785
Second	62,424	37,602	101,974	4,835	32,849	69,194	29,803	37,681	36,621	412,981
Third	63,743	37,569	102,260	4,840	32,924	69,372	29,701	37,401	36,611	414,420
Fourth	63,710	37,737	102,260	4,864	32,924	69,425	29,701	37,411	36,610	414,642
Latest	63,828	37,739	102,260	4,877	32,924	69,475	29,701	36,384	36,610	413,798
97:I										
First	15,764	9,678	24,571	1,253	8,301	17,706	8,051	9,788	9,314	104,575
Second	16,768	9,324	24,976	1,258	8,213	17,860	8,055	9,537	9,268	105,259
Third	16,768	9,415	25,162	1,258	8,919	18,368	8,060	9,537	9,268	106,755
Fourth	16,449	9,361	25,137	1,266	8,788	18,454	7,916	8,773	9,268	105,411
Latest	17,336	9,377	25,139	1,263	8,869	17,209	7,879	8,801	9,388	105,261
97:II										
First	17,410	9,352	25,846	1,355	8,100	17,947	7,789	9,851	9,275	106,925
Second	17,410	9,568	25,975	1,355	8,796	17,735	7,795	9,851	9,275	107,759
Third	17,729	9,511	25,966	1,363	8,652	17,820	7,834	9,172	9,275	107,324
Fourth	17,729	9,511	25,966	1,365	8,652	17,820	7,834	9,172	9,275	107,324
Latest	16,215	9,555	25,933	1,364	8,718	17,697	7,785	9,201	9,399	105,807
97:III										
First	16,226	9,495	27,630	1,377	8,850	18,323	8,140	10,132	9,558	109,730
Second	16,226	9,495	27,630	1,377	8,850	18,323	8,140	10,132	9,558	109,730
Third	16,374	9,723	28,362	1,419	9,045	18,469	8,098	9,166	9,558	110,063
Fourth	17,707	9,772	28,245	1,412	9,133	19,282	7,916	9,198	9,549	112,213
Latest	17,707	9,772	28,245	1,412	9,133	19,282	7,916	9,198	9,549	112,213
97:IV										
First	13,746	9,704	29,865	1,423	8,472	18,735	8,208	9,664	9,623	109,440
Second	13,746	9,704	29,865	1,423	8,472	18,735	8,208	9,664	9,623	109,440
Third	13,737	9,791	29,364	1,449	8,556	18,820	8,413	11,620	9,548	111,297
Fourth	13,210	9,834	28,313	1,442	8,627	19,336	8,203	11,343	9,598	109,905
Latest	13,210	9,834	28,313	1,442	8,627	19,336	8,203	11,343	9,598	109,905
Annual 97										
First	63,146	38,229	107,862	5,408	33,923	72,710	32,189	39,435	37,769	430,670
Second	64,149	38,091	108,446	5,414	34,331	72,652	32,198	39,184	37,724	432,188
Third	64,603	38,440	108,853	5,492	35,172	73,418	32,314	39,495	37,649	435,440
Fourth	65,095	38,479	107,661	5,484	35,199	74,891	31,868	38,485	37,691	434,852
Latest	64,468	38,538	107,630	5,480	35,346	73,524	31,783	38,543	37,935	433,246

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98:I										
First	17,660	8,767	24,317	1,322	6,171	16,041	8,002	8,583	9,367	100,130
Second	17,268	8,767	23,778	1,339	6,171	16,041	8,002	8,684	8,688	98,337
Third	17,399	9,000	22,359	1,382	4,952	14,207	6,938	8,740	8,972	94,129
Fourth	17,135	9,152	24,071	1,352	5,216	16,536	8,154	8,026	8,688	98,931
Latest	16,622	9,397	25,340	1,334	6,874	17,206	7,827	8,201	8,987	101,313
98:II										
First	16,985	8,778	20,958	1,283	5,025	13,735	6,825	7,431	8,907	89,933
Second	17,311	8,990	20,219	1,382	5,017	13,919	6,938	6,902	8,707	89,245
Third	15,931	8,985	21,856	1,279	4,766	14,694	6,659	6,917	9,204	90,403
Fourth	16,913	9,328	24,429	1,414	5,189	14,579	6,187	6,829	9,204	94,132
Latest	15,411	9,064	21,940	1,387	5,294	14,644	6,659	6,917	9,169	90,493
98:III										
First	16,292	9,199	21,823	1,387	5,339	13,832	6,587	7,221	9,062	90,933
Second	15,880	9,075	23,023	1,419	5,159	14,217	6,427	5,538	9,060	89,788
Third	16,913	9,328	24,489	1,414	5,189	14,579	6,187	6,829	9,204	94,132
Fourth	16,913	9,328	24,489	1,414	5,189	14,579	6,187	6,829	9,204	94,132
Latest	17,027	9,267	24,532	1,426	5,054	14,565	6,187	6,829	9,134	94,021
98:IV										
First	14,430	9,586	23,657	1,549	5,349	14,512	6,533	4,891	9,055	89,560
Second	14,951	9,861	23,908	1,460	5,305	13,737	6,292	6,332	9,207	90,733
Third	14,951	9,861	23,908	1,460	5,305	13,737	6,292	6,332	9,207	90,433
Fourth	14,951	9,861	23,908	1,460	5,305	13,737	6,292	6,332	9,207	90,433
Latest	14,963	9,745	23,908	1,457	5,239	13,842	6,292	6,332	9,186	90,563
Annual 98										
First	65,376	36,330	90,758	5,540	22,074	58,119	27,945	28,126	36,291	370,559
Second	65,410	36,653	90,129	5,580	21,652	57,914	27,658	27,456	35,762	368,213
Third	65,094	37,174	92,134	5,615	20,192	57,517	26,086	28,818	36,687	369,097
Fourth	65,913	37,669	96,256	5,630	21,499	59,431	26,819	28,016	36,403	377,627
Latest	64,029	37,473	95,321	5,623	22,460	60,257	26,975	28,279	36,475	376,893
99:I										
First	17,267	9,064	23,118	1,456	5,397	14,204	6,664	4,823	8,771	90,764
Second	17,698	9,070	22,920	1,353	5,014	13,613	6,417	6,290	9,243	91,618
Third	17,352	9,186	23,303	1,395	5,166	14,088	6,428	6,371	9,253	93,113
Fourth	18,093	9,188	23,547	1,412	5,266	14,366	6,438	6,365	9,097	93,973
Latest	18,097	9,188	23,547	1,412	5,266	14,366	6,438	6,365	9,097	93,973
99:II										
First	17,118	9,120	23,126	1,380	4,770	14,067	6,579	6,327	9,598	92,045
Second	16,924	8,999	23,587	1,302	5,241	14,631	6,459	6,380	9,479	93,202
Third	16,924	8,999	23,587	1,302	5,241	14,631	6,459	6,380	9,479	93,202
Fourth	16,925	9,038	23,923	1,519	5,337	14,790	6,529	6,426	9,310	93,848
Latest	16,925	9,038	23,923	1,519	5,337	14,790	6,529	6,426	9,310	93,848
99:III										
First	16,145	9,385	24,790	1,546	5,264	15,142	6,706	6,453	9,508	94,640
Second	16,145	9,386	24,399	1,546	5,364	15,142	6,706	6,453	9,508	94,640
Third	15,979	9,392	24,808	1,570	5,545	15,199	6,789	6,504	9,341	95,127
Fourth	15,979	9,392	24,808	1,570	5,545	15,199	6,789	6,504	9,341	95,127
Latest	15,979	9,392	24,808	1,570	5,545	15,199	6,789	6,504	9,341	95,127
99:IV										
First	14,514	9,877	25,288	1,539	5,362	15,699	7,026	6,662	9,536	95,642
Second	14,364	9,214	25,908	1,585	5,895	15,443	7,026	6,701	9,369	95,104
Third	14,364	9,214	25,908	1,585	5,895	15,443	7,026	6,701	9,369	95,104
Fourth	14,364	9,214	25,908	1,585	5,895	15,443	7,026	6,701	9,369	95,104
Latest	14,364	9,214	25,908	1,585	5,895	15,443	7,026	6,701	9,369	95,104
Annual 99										
First	65,044	37,147	95,922	5,920	21,032	59,112	26,976	24,264	37,373	373,691
Second	65,131	36,969	95,406	5,985	21,514	58,829	26,608	25,824	37,598	374,564
Third	65,219	36,790	97,207	6,052	21,848	59,371	26,702	25,916	37,442	376,547
Fourth	65,362	36,832	97,786	6,085	22,091	59,998	26,782	25,997	37,117	378,052
Latest	65,362	36,832	97,786	6,085	22,091	59,998	26,782	25,997	37,117	378,052

Note: underlined numbers are the same as the previous estimates because now estimates are not yet available

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Table A.2
Percentage Change in Estimates

	Agriculture	Mining	Industry	EGW	Construction	Trade	Transport	Finance	Services	GDP
96:I										
Second/First	0.0%	-1.1%	-3.0%	-0.1%	-7.3%	-1.2%	0.7%	-2.7%	0.0%	-1.8%
Third/Second	6.1%	-0.4%	-0.1%	0.3%	-6.8%	0.5%	-0.7%	-1.3%	-0.1%	0.7%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.7%	0.0%	-0.0%	1.1%	-0.0%	0.3%	0.0%	-11.0%	-0.0%	-0.9%
Latest/First	6.9%	-1.5%	-3.1%	1.3%	-8.0%	-0.4%	0.0%	-15.3%	-0.1%	-1.9%
96:II										
Second/First	-0.0%	1.6%	-2.3%	0.7%	-4.5%	-2.3%	0.7%	-2.1%	0.0%	-1.3%
Third/Second	2.1%	0.1%	1.4%	0.3%	1.8%	0.5%	-0.7%	-1.5%	-0.1%	0.7%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	2.1%	1.7%	-0.9%	1.0%	-2.7%	-1.8%	-0.0%	-3.6%	-0.1%	-0.6%
96:III										
Second/First	-1.5%	0.6%	-1.6%	0.5%	6.1%	0.5%	-0.7%	-1.0%	-0.1%	-1.3%
Third/Second	0.0%	0.0%	-0.0%	-0.0%	0.0%	0.0%	-0.0%	0.0%	0.0%	0.0%
Fourth/Third	0.2%	0.0%	0.0%	0.7%	-0.0%	0.1%	0.0%	-6.3%	-0.0%	-0.5%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-4.4%	0.6%	-1.6%	1.2%	6.1%	0.7%	-0.7%	-7.8%	-0.1%	-2.0%
96:IV										
Second/First	2.3%	-4.8%	5.0%	1.0%	-5.5%	0.5%	-0.8%	-1.5%	0.4%	0.8%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	-0.4%	1.7%	0.0%	1.2%	0.0%	0.1%	-0.0%	6.3%	0.0%	0.7%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	1.8%	-3.1%	5.8%	2.2%	-5.5%	0.7%	-0.8%	4.7%	0.4%	1.5%
Annual 96										
Second/First	-0.7%	-1.0%	-0.9%	0.5%	-2.7%	-0.6%	-0.0%	-2.0%	0.1%	-0.9%
Third/Second	2.1%	-0.1%	0.3%	0.1%	0.2%	0.3%	-0.3%	-0.7%	-0.0%	0.3%
Fourth/Third	-0.1%	0.4%	0.0%	0.5%	-0.0%	0.1%	0.0%	0.0%	-0.0%	0.1%
Latest/Fourth	0.2%	0.0%	-0.0%	0.3%	0.0%	0.1%	0.0%	-2.7%	0.0%	-0.2%
Latest/First	1.5%	-0.7%	-0.6%	1.4%	-2.4%	-0.2%	-0.4%	-5.3%	0.1%	-0.7%
97:I										
Second/First	6.4%	-3.7%	1.9%	0.5%	-3.4%	0.9%	0.0%	-2.6%	-0.5%	0.7%
Third/Second	0.0%	1.0%	0.7%	0.0%	2.6%	2.8%	0.1%	0.0%	0.0%	1.4%
Fourth/Third	-1.9%	-0.6%	-0.1%	0.6%	-1.5%	0.5%	-1.8%	-8.0%	0.0%	-1.3%
Latest/Fourth	5.4%	0.2%	0.0%	-0.3%	0.9%	-6.7%	-0.5%	0.3%	1.3%	-0.1%
Latest/First	10.0%	-3.1%	2.5%	0.8%	4.3%	-2.9%	-2.1%	-10.1%	0.8%	0.7%
97:II										
Second/First	0.0%	2.3%	0.5%	0.0%	8.0%	-1.2%	0.1%	-0.0%	-0.6%	0.8%
Third/Second	1.8%	-0.6%	-0.0%	0.7%	-1.6%	0.5%	0.5%	-6.9%	0.0%	-0.4%
Fourth/Third	-0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	0.0%	-0.0%
Latest/Fourth	-3.5%	0.5%	-0.1%	-0.1%	0.8%	-0.7%	-0.6%	0.3%	1.3%	-1.4%
Latest/First	-6.9%	2.2%	0.3%	0.7%	7.6%	-1.4%	-0.1%	-6.6%	1.3%	-1.0%
97:III										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	0.5%	2.4%	2.0%	3.1%	2.2%	0.5%	-1.6%	-9.5%	0.0%	0.3%
Fourth/Third	3.1%	0.5%	-0.4%	-0.5%	1.0%	4.7%	-1.1%	0.3%	-0.1%	2.0%
Latest/Fourth	-0.0%	0.0%	0.0%	-0.0%	0.0%	0.0%	-0.0%	0.0%	-0.0%	0.0%
Latest/First	9.1%	2.9%	2.2%	2.5%	3.2%	5.2%	-2.8%	-9.2%	-0.1%	2.3%
97:IV										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	-0.1%	0.9%	-1.7%	1.8%	1.0%	0.3%	2.3%	20.2%	-0.8%	1.7%
Fourth/Third	-3.8%	0.4%	-3.6%	-0.5%	0.8%	2.7%	-2.5%	-2.4%	0.5%	-1.3%
Latest/Fourth	-0.0%	0.0%	0.0%	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-3.9%	1.3%	-5.2%	1.3%	1.8%	3.2%	-0.1%	17.4%	-0.3%	0.4%
Annual 97										
Second/First	1.6%	-0.4%	0.5%	0.1%	1.2%	-0.1%	0.0%	-0.6%	-0.1%	0.4%
Third/Second	0.7%	0.9%	0.4%	1.4%	2.4%	1.1%	0.4%	0.8%	-0.2%	0.8%
Fourth/Third	0.8%	0.1%	-1.1%	-0.1%	0.1%	2.0%	-1.1%	-2.0%	0.1%	-0.1%
Latest/Fourth	-1.0%	0.2%	-0.6%	-0.1%	0.4%	-1.8%	-0.3%	0.1%	0.6%	-0.4%
Latest/First	2.1%	0.8%	-0.2%	1.3%	4.2%	1.1%	-1.3%	-2.3%	0.4%	0.6%

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98:I										
Second/First	-2.2%	0.0%	-3.9%	1.2%	0.0%	0.0%	0.0%	1.2%	-6.2%	-1.8%
Third/Second	0.2%	2.7%	-3.5%	3.2%	-20.1%	-10.8%	-13.3%	0.6%	3.3%	-4.3%
Fourth/Third	-0.9%	1.7%	6.7%	-2.1%	17.9%	15.6%	17.5%	-8.2%	-3.2%	5.1%
Latest/Fourth	-3.0%	2.7%	5.3%	0.1%	18.2%	4.1%	-4.0%	2.2%	3.4%	2.9%
Latest/First	-5.6%	7.2%	4.2%	2.4%	11.4%	7.3%	-2.2%	-4.5%	-3.0%	1.7%
98:II										
Second/First	1.9%	2.0%	-3.5%	7.7%	-0.2%	1.3%	1.7%	-7.1%	-2.2%	-0.7%
Third/Second	-8.0%	0.4%	8.1%	-0.2%	-5.0%	5.0%	-5.9%	0.2%	5.7%	1.2%
Fourth/Third	6.2%	3.8%	12.0%	2.5%	8.5%	-0.8%	-7.2%	-1.3%	0.0%	4.1%
Latest/Fourth	-8.9%	-2.8%	-10.4%	-1.9%	2.0%	0.4%	7.8%	1.3%	-0.4%	-3.9%
Latest/First	-9.3%	3.3%	4.7%	8.2%	5.3%	6.6%	-2.3%	-6.9%	2.9%	0.6%
98:III										
Second/First	-2.5%	-1.4%	5.5%	2.4%	-6.7%	2.8%	-2.1%	-23.3%	-0.0%	-1.3%
Third/Second	6.5%	2.6%	6.4%	-0.4%	0.6%	2.5%	-3.7%	23.3%	1.6%	-4.8%
Fourth/Third	0.0%	0.0%	0.6%	-0.6%	-0.6%	0.0%	-0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.7%	-0.7%	0.2%	0.8%	-2.6%	-0.1%	0.0%	0.0%	-0.8%	-0.1%
Latest/First	-4.5%	0.7%	12.4%	2.8%	-8.6%	5.3%	-6.1%	-5.4%	0.8%	3.4%
98:IV										
Second/First	3.6%	2.9%	-0.6%	-7.0%	-0.8%	-5.3%	-3.7%	29.5%	2.8%	1.3%
Third/Second	0.0%	-0.0%	-1.3%	0.0%	0.0%	0.0%	0.0%	-0.0%	0.0%	-0.3%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.1%	-1.2%	1.3%	1.2%	-1.3%	0.8%	0.0%	0.0%	-1.3%	0.1%
Latest/First	3.7%	1.7%	-0.6%	-5.9%	-2.1%	-4.6%	-3.7%	29.4%	1.4%	1.3%
Annual 98										
Second/First	0.1%	0.9%	-0.7%	0.7%	-1.9%	-0.4%	-1.0%	-2.4%	-1.5%	-0.6%
Third/Second	-0.5%	1.4%	2.2%	0.6%	-6.7%	-1.0%	-5.7%	5.0%	2.6%	0.2%
Fourth/Third	1.3%	1.3%	4.5%	0.1%	6.5%	3.7%	2.8%	-2.8%	-0.8%	2.3%
Latest/Fourth	-2.9%	-0.5%	-1.0%	0.1%	4.5%	1.4%	0.6%	0.5%	0.2%	-0.2%
Latest/First	-2.1%	3.1%	5.0%	1.5%	1.8%	3.7%	-3.3%	0.5%	0.5%	1.7%
99:I										
Second/First	2.5%	0.1%	-0.8%	-7.1%	-7.1%	-4.2%	-3.7%	30.4%	5.4%	0.9%
Third/Second	1.4%	1.3%	1.7%	3.1%	3.0%	3.6%	0.2%	0.6%	0.1%	1.6%
Fourth/Third	0.8%	0.6%	1.0%	1.2%	1.5%	3.3%	0.2%	0.5%	-1.7%	0.9%
Latest/Fourth	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%
Latest/First	-4.8%	1.4%	1.9%	-3.0%	-2.4%	2.3%	-3.4%	32.0%	3.7%	3.5%
99:II										
Second/First	-1.1%	-1.3%	2.0%	8.9%	9.9%	4.0%	-1.8%	0.8%	-0.8%	1.3%
Third/Second	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	0.0%
Fourth/Third	0.0%	0.4%	1.4%	1.1%	2.8%	1.3%	1.1%	0.7%	-1.8%	0.7%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-1.1%	-0.9%	3.4%	10.1%	12.9%	5.3%	-0.8%	1.6%	-2.6%	2.0%
99:III										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	-1.0%	0.1%	1.7%	1.6%	3.4%	0.4%	1.2%	0.8%	-1.8%	0.5%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%
Latest/Fourth	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-1.0%	0.1%	1.7%	1.6%	3.4%	0.4%	1.2%	0.8%	-1.8%	0.5%
99:IV										
Second/First	-1.0%	-6.7%	0.9%	3.0%	7.2%	-1.6%	0.0%	0.6%	-1.8%	-0.6%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-1.0%	-6.7%	0.9%	3.0%	7.2%	-1.6%	0.0%	0.6%	-1.8%	-0.6%
Annual 99										
Second/First	0.1%	-2.1%	0.5%	1.1%	2.3%	-0.5%	-1.4%	6.4%	0.6%	0.4%
Third/Second	0.1%	0.3%	0.8%	1.1%	1.6%	0.9%	0.4%	0.4%	-0.4%	0.5%
Fourth/Third	-0.2%	0.1%	0.6%	0.5%	1.1%	1.1%	0.3%	0.3%	-0.9%	0.4%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	0.5%	-1.6%	1.9%	2.8%	5.0%	1.5%	-0.7%	7.1%	-0.7%	1.3%

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Table A.3
GDP At Current Prices

	Agriculture	Mining	Industry	EGW	Construction	Trade	Transport	Finance	Services	GDP
96:I										
First	22,552	10,684	29,103	1,491	9,672	19,849	8,233	10,851	12,602	125,035
Second	22,552	10,233	29,122	1,505	8,965	20,539	8,366	11,208	11,073	125,563
Third	22,508	10,477	29,437	1,510	8,830	20,643	8,220	10,625	11,073	123,324
Fourth	22,508	10,477	29,437	1,510	8,830	20,643	8,220	10,625	11,073	123,324
Latest	22,586	10,479	30,099	1,647	8,830	19,825	8,220	9,828	11,073	122,587
96:II										
First	24,773	10,521	30,135	1,626	9,072	21,005	8,829	11,645	10,843	128,448
Second	24,773	10,521	30,135	1,626	9,072	21,005	8,829	11,645	10,843	128,448
Third	24,093	10,896	30,807	1,632	9,231	21,112	8,678	10,992	11,347	128,788
Fourth	24,093	10,896	30,807	1,632	9,231	21,112	8,678	10,992	11,347	128,788
Latest	24,093	10,896	30,807	1,632	9,231	21,112	8,678	10,992	11,347	128,788
96:III										
First	23,722	10,992	37,052	1,704	11,098	22,304	8,891	12,014	11,594	139,370
Second	22,307	11,726	35,916	1,714	11,692	22,412	8,735	11,376	11,553	137,429
Third	22,307	11,726	35,916	1,714	11,692	22,412	8,735	11,376	11,553	137,429
Fourth	22,653	11,727	36,017	1,791	11,692	21,973	8,735	10,800	11,553	136,940
Latest	22,653	11,727	36,017	1,791	11,692	21,973	8,735	10,800	11,553	136,940
96:IV										
First	15,166	12,147	36,780	1,726	13,144	24,604	9,408	11,973	12,568	137,576
Second	19,133	12,817	39,421	1,737	12,272	24,712	9,293	11,378	12,327	143,090
Third	19,133	12,817	39,421	1,737	12,272	24,712	9,293	11,378	12,327	143,090
Fourth	19,460	12,986	39,504	1,823	12,272	24,228	9,293	12,362	12,327	144,253
Latest	19,460	12,986	39,504	1,823	12,272	24,228	9,293	12,362	12,327	144,253
Annual 96										
First	86,212	44,344	133,070	6,547	42,986	87,762	35,420	46,482	47,607	530,429
Second	88,765	45,297	134,593	6,582	42,001	88,667	35,223	45,697	45,795	532,530
Third	88,041	45,916	135,581	6,594	42,025	88,878	34,926	44,372	46,300	532,631
Fourth	88,714	46,088	135,764	6,756	42,025	87,955	34,926	44,779	46,300	533,305
Latest	88,792	46,088	136,426	6,893	42,025	87,137	34,926	43,982	46,299	532,568
97:I										
First	25,237	11,481	32,551	1,732	10,557	23,787	9,744	12,722	12,346	140,157
Second	25,453	12,259	34,778	1,718	10,771	24,126	9,680	12,258	11,691	142,735
Third	25,310	12,399	35,102	1,719	7,907	24,936	9,485	11,969	11,934	140,761
Fourth	24,702	12,319	35,942	1,796	10,823	24,771	9,485	11,593	11,517	142,948
Latest	26,248	12,808	38,351	1,784	10,955	22,168	9,483	11,634	12,370	145,801
97:II										
First	26,926	11,630	35,840	1,851	10,968	24,771	9,875	12,661	12,954	147,476
Second	27,109	11,793	36,361	1,853	12,536	24,231	10,033	12,323	13,140	149,380
Third	27,109	11,793	36,361	1,853	12,536	24,231	10,033	12,323	13,140	149,380
Fourth	27,349	11,714	36,998	1,934	11,361	24,087	10,033	12,460	12,944	148,879
Latest	24,947	12,166	39,708	1,916	11,469	23,037	9,236	12,502	14,426	149,406
97:III										
First	24,781	16,219	41,260	1,903	13,196	26,134	10,871	12,822	13,839	161,026
Second	24,781	16,219	41,260	1,903	13,196	26,134	10,871	12,822	13,839	161,026
Third	25,735	12,824	41,156	2,023	12,140	25,997	10,871	13,577	13,721	158,044
Fourth	28,079	13,211	43,570	1,999	12,282	26,431	9,578	13,618	14,468	163,237
Latest	28,079	13,211	43,570	1,999	12,282	26,431	9,579	13,618	14,468	163,237
97:IV										
First	23,149	19,081	47,106	2,111	13,374	29,131	11,843	12,450	14,925	173,170
Second	23,149	19,081	47,106	2,111	13,374	29,131	11,843	12,450	14,925	173,170
Third	22,364	17,653	45,653	2,186	11,857	28,908	11,843	21,061	14,110	175,635
Fourth	21,736	17,377	46,549	2,133	11,974	27,946	10,233	16,607	14,698	169,252
Latest	21,736	17,377	46,549	2,133	11,974	27,946	10,234	16,607	14,698	169,252
Annual 97										
First	100,092	58,411	156,757	7,597	48,096	103,824	42,333	50,656	54,063	621,829
Second	100,492	59,352	159,506	7,585	49,877	103,623	42,428	49,854	53,595	626,311
Third	100,519	54,689	158,271	7,782	44,440	104,073	42,232	58,931	52,905	623,820
Fourth	101,866	54,621	163,059	7,862	46,440	103,234	39,329	54,277	53,627	624,316
Latest	101,009	55,562	168,178	7,832	46,679	99,582	38,531	54,360	55,962	627,695

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Table A.4
Percentage Change in Estimates

	Agriculture	Mining	Industry	ECW	Construction	Trade	Transport	Finance	Services	GDP
96:I										
Second/First	0.0%	-4.2%	0.1%	0.9%	-7.3%	3.5%	1.6%	3.3%	-12.1%	-1.2%
Third/Second	-0.2%	2.4%	1.1%	0.5%	-1.5%	0.5%	-2.7%	-5.2%	0.0%	-0.2%
Fourth/Third	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.3%	0.0%	2.2%	9.0%	0.0%	-4.0%	0.0%	-7.5%	-0.0%	-0.6%
Latest/First	0.2%	-1.9%	3.4%	10.5%	-8.7%	-0.1%	-0.1%	-9.4%	-12.1%	-2.0%
96:II										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	-2.7%	3.6%	2.2%	0.4%	1.8%	0.5%	-1.7%	-5.6%	4.7%	0.3%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-2.7%	3.6%	2.2%	0.4%	1.8%	0.5%	-1.7%	-5.6%	4.7%	0.3%
96:III										
Second/First	-6.0%	6.7%	-3.1%	0.6%	5.4%	0.5%	-1.8%	-5.3%	-0.4%	-1.4%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	1.6%	0.0%	0.3%	4.5%	0.0%	-2.0%	0.0%	-5.1%	0.0%	-0.4%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-4.5%	6.7%	-2.8%	5.1%	5.4%	-1.5%	-1.8%	-10.1%	-0.4%	-1.7%
96:IV										
Second/First	26.2%	5.9%	7.2%	0.7%	-6.6%	0.4%	-1.9%	-5.0%	-1.0%	4.0%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	1.7%	1.3%	0.2%	4.9%	0.0%	-2.0%	0.0%	8.6%	0.0%	0.8%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	28.3%	6.9%	7.4%	5.6%	-6.6%	-1.5%	-1.9%	3.2%	-1.9%	4.9%
Annual 96										
Second/First	3.0%	2.1%	1.1%	0.5%	-2.3%	1.0%	-0.6%	-1.9%	-3.8%	0.4%
Third/Second	-0.8%	1.4%	0.7%	0.2%	0.1%	0.2%	-0.8%	-2.7%	1.1%	0.6%
Fourth/Third	0.8%	0.4%	0.1%	2.5%	0.0%	-1.0%	0.0%	0.9%	0.0%	0.1%
Latest/Fourth	0.1%	0.0%	0.5%	2.0%	0.0%	-0.9%	0.0%	-1.8%	-0.0%	-0.1%
Latest/First	3.0%	3.9%	2.5%	5.3%	-2.2%	-0.7%	-1.4%	-5.4%	-2.7%	0.4%
97:I										
Second/First	0.9%	6.8%	6.8%	-0.8%	2.0%	1.4%	-0.7%	-3.6%	-5.3%	1.8%
Third/Second	-0.6%	1.1%	0.9%	0.1%	-26.6%	5.4%	-2.0%	-2.4%	2.1%	-1.4%
Fourth/Third	-2.4%	-0.0%	2.4%	4.4%	36.9%	-0.7%	0.0%	-3.1%	-5.9%	1.6%
Latest/Fourth	6.3%	4.0%	6.7%	-0.7%	1.2%	-10.5%	-0.0%	0.4%	7.4%	2.0%
Latest/First	4.0%	11.0%	17.8%	3.0%	3.8%	-6.8%	-2.7%	-6.6%	0.2%	4.0%
97:II										
Second/First	0.7%	1.4%	1.5%	0.1%	14.3%	-2.2%	1.6%	-2.7%	1.4%	1.3%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	0.9%	-0.7%	1.8%	4.4%	-9.4%	-0.6%	0.0%	1.1%	-1.5%	-0.3%
Latest/Fourth	-8.8%	3.9%	7.3%	-0.9%	0.0%	-4.4%	-7.9%	0.3%	31.5%	0.4%
Latest/First	-7.4%	4.6%	10.8%	3.5%	4.6%	-7.0%	-6.5%	-1.3%	11.4%	1.3%
97:III										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	3.9%	-20.9%	-0.3%	6.3%	-8.0%	-0.5%	0.0%	5.9%	-0.9%	-1.5%
Fourth/Third	9.1%	3.0%	5.9%	-1.2%	1.2%	1.7%	-11.9%	0.3%	5.4%	3.3%
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	-0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	13.3%	-18.5%	5.6%	5.0%	-6.9%	1.1%	-11.9%	6.2%	4.6%	1.4%
97:IV										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	-3.4%	-7.5%	-3.1%	3.6%	-11.3%	-0.8%	0.0%	69.2%	-3.3%	1.4%
Fourth/Third	-2.8%	-1.6%	2.0%	-2.4%	1.0%	-3.3%	-13.6%	-21.2%	4.2%	-3.6%
Latest/Fourth	-0.0%	-0.0%	0.0%	0.0%	0.0%	-0.0%	0.0%	0.0%	-0.0%	0.0%
Latest/First	-6.1%	-8.9%	-1.2%	1.1%	-10.3%	-4.1%	-13.6%	33.4%	-1.5%	-2.3%
Annual 97										
Second/First	0.4%	1.6%	1.8%	-0.2%	3.7%	-0.2%	0.2%	-1.6%	-0.9%	0.7%
Third/Second	0.0%	-7.9%	-0.8%	2.6%	-10.9%	0.4%	-0.5%	18.2%	-1.3%	-0.4%
Fourth/Third	1.3%	-0.1%	3.0%	1.0%	4.5%	-0.8%	-8.9%	-7.9%	1.4%	0.1%
Latest/Fourth	-0.8%	1.7%	3.1%	-0.4%	0.5%	-3.5%	-2.0%	0.2%	4.4%	0.5%
Latest/First	0.9%	-4.9%	7.3%	3.1%	-2.9%	-4.1%	-9.0%	7.3%	3.5%	0.9%

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98:I											
First	29,919	24,520	41,036	1,876	11,651	26,485	11,016	11,776	12,835	171,113	
Second	40,801	21,374	47,359	2,147	11,651	31,475	12,398	21,319	13,690	202,195	
Third	43,636	29,240	48,366	2,148	12,570	32,440	12,335	21,629	13,690	216,053	
Fourth	43,689	29,240	47,960	2,148	12,570	32,972	12,335	21,629	13,690	216,232	
Latest	35,923	29,190	51,934	2,127	16,918	36,972	11,806	17,793	15,392	217,655	
98:II											
First	44,970	26,152	58,424	2,329	11,587	31,524	13,966	23,682	16,389	228,983	
Second	49,799	29,912	52,338	2,515	12,502	32,497	13,869	24,407	18,119	235,957	
Third	48,833	28,499	55,594	2,860	12,251	33,177	13,869	30,761	17,730	243,592	
Fourth	40,726	30,093	49,599	2,821	11,425	32,487	11,937	16,073	19,197	214,359	
Latest	38,532	32,983	50,843	2,838	13,998	41,981	12,408	17,619	21,186	232,387	
98:III											
First	50,935	35,915	68,607	2,909	14,344	36,356	13,672	26,229	16,614	265,621	
Second	49,039	32,823	72,954	3,091	14,105	37,639	13,409	14,620	19,240	256,919	
Third	53,273	37,567	66,882	3,059	15,617	38,420	11,741	17,476	19,203	263,238	
Fourth	51,217	40,096	68,150	3,059	15,617	46,629	13,411	17,476	22,354	278,008	
Latest	50,831	38,640	66,097	3,085	14,997	46,602	13,411	17,476	22,324	273,463	
98:IV											
First	46,930	37,470	81,734	3,432	15,172	43,690	14,027	12,422	17,672	272,548	
Second	51,516	28,378	67,509	3,150	16,330	41,588	12,295	17,118	20,164	258,048	
Third	51,516	28,378	67,509	3,150	16,330	41,588	12,295	17,118	20,164	258,048	
Fourth	49,244	33,742	71,521	3,150	16,330	42,231	14,312	17,118	23,336	270,964	
Latest	48,626	32,541	69,191	3,185	15,844	42,090	14,312	17,118	23,204	266,108	
Annual 98											
First	172,754	121,057	249,801	10,546	52,754	138,095	52,681	74,088	63,489	938,265	
Second	191,155	112,487	240,140	10,903	54,587	143,199	51,971	77,464	71,213	953,119	
Third	197,258	123,686	238,351	11,216	56,768	145,625	50,240	86,984	70,807	989,931	
Fourth	184,876	133,171	237,230	11,178	55,943	154,319	51,995	72,297	78,576	979,584	
Latest	173,912	133,353	238,064	11,235	61,756	167,244	51,937	70,007	82,103	989,612	
99:I											
First	56,202	31,937	81,218	3,249	15,661	45,575	15,103	13,113	18,321	280,377	
Second	64,011	30,327	68,755	2,985	16,846	42,968	13,838	17,610	20,572	277,912	
Third	64,104	26,091	69,279	3,057	16,033	43,278	13,652	17,115	20,561	273,172	
Fourth	62,681	25,456	69,435	3,093	16,738	45,268	18,384	17,188	22,809	281,052	
Latest	62,681	25,456	69,435	3,093	16,738	45,268	18,384	17,188	22,809	281,052	
99:II											
First	61,343	29,710	69,895	2,560	17,039	44,468	14,414	18,829	24,770	283,028	
Second	60,846	28,244	71,243	3,295	16,313	45,027	14,115	17,698	27,119	283,909	
Third	57,895	26,328	67,981	3,294	16,333	45,175	16,567	17,487	26,782	277,844	
Fourth	59,686	26,881	66,994	3,330	17,524	44,740	16,567	17,697	26,393	279,812	
Latest	59,686	26,881	66,994	3,330	17,524	44,740	16,567	17,696	26,393	279,811	
99:III											
First	55,843	27,019	73,436	3,396	16,698	46,131	15,085	17,700	24,741	280,068	
Second	50,484	27,639	72,811	3,404	16,783	45,777	15,275	17,670	24,741	274,584	
Third	51,066	28,722	72,549	3,444	18,233	46,185	15,275	17,804	24,305	277,583	
Fourth	51,066	28,722	72,549	3,444	18,233	46,185	15,275	17,804	24,305	277,583	
Latest	51,066	28,722	72,549	3,444	18,233	46,185	15,275	17,804	24,305	277,583	
99:IV											
First	44,763	29,497	73,987	3,405	17,208	48,085	15,850	18,130	23,587	274,513	
Second	44,612	31,579	75,827	3,503	20,922	47,434	15,850	18,188	23,180	281,095	
Third	44,612	31,579	75,827	3,503	20,922	47,434	15,850	18,188	23,180	281,095	
Fourth	44,612	31,579	75,827	3,503	20,922	47,434	15,850	18,188	23,180	281,095	
Latest	44,612	31,579	75,827	3,503	20,922	47,434	15,850	18,188	23,180	281,095	
Annual 99											
First	238,151	118,162	298,556	12,610	66,605	184,258	60,453	67,772	91,419	1,117,986	
Second	219,953	117,789	288,636	13,187	70,964	181,206	59,079	71,166	95,611	1,117,490	
Third	217,677	112,720	285,636	13,298	71,525	182,072	61,345	70,585	94,828	1,109,695	
Fourth	218,045	112,638	284,804	13,369	73,418	183,627	66,077	70,877	96,688	1,119,542	
Latest	218,045	112,637	284,805	13,369	73,418	183,627	66,076	70,877	96,687	1,119,541	

Note: Underlined numbers are the same as the previous estimates because new estimates are not yet available

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Table A.4
Percentage Change in Estimates

	Agriculture	Mining	Industry	ECW	Construction	Trade	Transport	Finance	Services	GDP
96:I										
Second/First	0.0%	-4.2%	0.1%	0.9%	-7.3%	3.5%	1.6%	3.3%	-12.1%	-1.2%
Third/Second	-0.2%	2.4%	1.1%	0.5%	-1.5%	0.5%	-2.7%	-5.2%	0.0%	-0.2%
Fourth/Third	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.3%	0.0%	2.2%	9.0%	0.0%	-4.0%	0.0%	-7.5%	-0.0%	-0.6%
Latest/First	0.2%	-1.9%	3.4%	10.5%	-8.7%	-0.1%	-0.1%	-9.4%	-12.1%	-2.0%
96:II										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	-2.7%	3.6%	2.2%	0.4%	1.8%	0.5%	-1.7%	-5.6%	4.7%	0.3%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-2.7%	3.6%	2.2%	0.4%	1.8%	0.5%	-1.7%	-5.6%	4.7%	0.3%
96:III										
Second/First	-6.0%	6.7%	-3.1%	0.6%	5.4%	0.5%	-1.8%	-5.3%	-0.4%	-1.4%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	1.6%	0.0%	0.3%	4.5%	0.0%	-2.0%	0.0%	-5.1%	0.0%	-0.4%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-4.5%	6.7%	-2.8%	5.1%	5.4%	-1.5%	-1.8%	-10.1%	-0.4%	-1.7%
96:IV										
Second/First	26.2%	5.5%	7.2%	0.7%	-6.6%	0.4%	-1.5%	-5.0%	-1.0%	4.0%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	1.7%	1.3%	0.2%	4.9%	0.0%	-2.0%	0.0%	8.6%	0.0%	0.8%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	28.3%	6.9%	7.4%	5.6%	-6.6%	-1.5%	-1.5%	3.2%	-1.9%	4.9%
Annual 96										
Second/First	3.0%	2.1%	1.1%	0.5%	-2.3%	1.0%	-0.6%	-1.9%	-3.8%	0.4%
Third/Second	-0.8%	1.4%	0.7%	0.2%	0.1%	0.2%	-0.8%	-2.7%	1.1%	0.0%
Fourth/Third	0.8%	0.4%	0.1%	2.5%	0.0%	-1.0%	0.0%	0.9%	0.0%	0.1%
Latest/Fourth	0.1%	0.0%	0.5%	2.0%	0.0%	-0.9%	0.0%	-1.8%	-0.0%	-0.1%
Latest/First	3.0%	3.9%	2.5%	5.3%	-2.2%	-0.7%	-1.4%	-5.4%	-2.7%	0.4%
97:I										
Second/First	0.9%	6.8%	6.8%	-0.8%	2.0%	1.4%	-0.7%	-3.6%	-5.3%	1.8%
Third/Second	-0.6%	1.1%	0.9%	0.1%	-26.6%	5.4%	-2.0%	-2.4%	2.1%	-1.4%
Fourth/Third	-2.4%	-0.0%	2.4%	4.4%	36.9%	-0.7%	0.0%	-3.1%	-5.5%	1.6%
Latest/Fourth	6.3%	4.0%	6.7%	-0.7%	1.2%	-10.5%	-0.0%	0.4%	7.4%	2.0%
Latest/First	4.0%	11.0%	17.8%	3.0%	3.8%	-6.8%	-2.7%	-6.6%	0.2%	4.0%
97:II										
Second/First	0.7%	1.4%	1.5%	0.1%	14.3%	-2.2%	1.6%	-2.7%	1.4%	1.3%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	0.9%	-0.7%	1.8%	4.4%	-9.4%	-0.6%	0.0%	1.1%	-1.5%	-0.3%
Latest/Fourth	-8.2%	3.9%	7.3%	-0.9%	0.0%	-4.4%	-7.9%	0.3%	11.5%	0.4%
Latest/First	-7.4%	4.6%	10.8%	3.5%	4.6%	-7.0%	-6.5%	-1.3%	11.4%	1.3%
97:III										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	3.9%	-20.9%	-0.3%	6.3%	-8.0%	-0.5%	0.0%	3.5%	-0.9%	-1.5%
Fourth/Third	9.1%	3.0%	5.9%	-1.2%	1.2%	1.7%	-11.9%	0.3%	5.4%	3.3%
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	-0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	13.3%	-18.5%	5.6%	5.0%	-6.9%	1.1%	-11.9%	6.2%	4.6%	1.4%
97:IV										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	-3.1%	-7.5%	-3.1%	3.6%	-11.3%	-0.8%	0.0%	69.2%	-5.3%	1.4%
Fourth/Third	-2.8%	-1.6%	2.0%	-2.4%	1.0%	-3.3%	-13.6%	-21.2%	4.2%	-3.6%
Latest/Fourth	-0.0%	-0.0%	0.0%	0.0%	0.0%	-0.0%	0.0%	0.0%	-0.0%	0.0%
Latest/First	-6.1%	-8.5%	-1.2%	1.1%	-10.3%	-4.1%	-13.6%	33.4%	-1.5%	-2.3%
Annual 97										
Second/First	0.4%	1.6%	1.8%	-0.2%	3.7%	-0.2%	0.2%	-1.6%	-0.9%	0.7%
Third/Second	0.0%	-7.9%	-0.8%	2.6%	-10.9%	0.4%	-0.3%	18.2%	-1.3%	-0.4%
Fourth/Third	1.3%	-0.1%	3.0%	1.0%	4.5%	-0.8%	-6.9%	-7.9%	1.4%	0.1%
Latest/Fourth	-0.8%	1.7%	3.1%	-0.4%	0.5%	-3.5%	-2.0%	0.2%	4.4%	0.5%
Latest/First	0.9%	-4.9%	7.3%	3.1%	-2.9%	-4.1%	-9.0%	7.3%	3.5%	0.9%

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98:I											
Second/First	36.4%	-12.8%	15.4%	14.5%	-0.0%	18.8%	12.5%	81.0%	6.7%	18.2%	
Third/Second	6.9%	36.8%	2.2%	0.0%	7.9%	3.1%	-0.5%	1.5%	0.0%	6.9%	
Fourth/Third	0.1%	0.0%	-0.8%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.1%	
Latest/Fourth	-17.3%	-0.2%	8.3%	-1.0%	34.6%	10.9%	-4.3%	-17.7%	12.4%	0.7%	
Latest/First	20.1%	19.0%	26.6%	13.4%	45.2%	38.1%	7.2%	51.1%	19.9%	27.2%	
98:II											
Second/First	10.7%	14.4%	-10.4%	8.0%	7.9%	3.1%	-0.7%	3.1%	10.7%	3.0%	
Third/Second	-1.9%	-1.7%	6.2%	13.7%	-2.0%	2.1%	0.0%	26.0%	-2.0%	3.2%	
Fourth/Third	-16.6%	5.6%	-10.8%	-1.3%	-6.7%	-2.1%	-13.9%	-47.7%	8.2%	-12.0%	
Latest/Fourth	-5.4%	9.6%	2.5%	0.6%	23.5%	29.2%	3.9%	9.6%	10.4%	8.4%	
Latest/First	-14.3%	26.1%	-13.0%	21.8%	20.8%	33.2%	-11.2%	-25.5%	29.4%	1.5%	
98:III											
Second/First	-3.7%	-8.6%	6.3%	6.3%	-1.7%	3.4%	-1.9%	-14.3%	13.8%	-3.3%	
Third/Second	8.6%	14.5%	-8.3%	-1.0%	10.7%	2.1%	-12.4%	19.5%	-0.2%	2.5%	
Fourth/Third	-3.9%	6.7%	1.9%	-0.0%	0.0%	21.4%	14.2%	0.0%	16.4%	5.6%	
Latest/Fourth	-0.8%	-3.6%	-3.0%	0.9%	-4.0%	-0.1%	0.0%	0.0%	-0.1%	-1.6%	
Latest/First	-0.2%	7.6%	-3.7%	6.1%	4.6%	28.0%	-1.9%	-33.4%	34.4%	3.0%	
98:IV											
Second/First	9.8%	-24.3%	-17.4%	-8.2%	7.6%	-4.8%	-12.3%	37.8%	14.1%	-5.3%	
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Fourth/Third	-4.4%	18.9%	5.9%	0.0%	0.0%	1.5%	16.4%	0.0%	15.7%	5.0%	
Latest/Fourth	-1.3%	-3.6%	-3.3%	1.1%	-3.0%	-0.3%	0.0%	0.0%	-0.6%	-1.3%	
Latest/First	3.6%	-13.2%	-15.3%	-7.2%	4.4%	-3.7%	2.0%	37.8%	31.3%	-2.4%	
Annual 98											
Second/First	10.7%	-9.3%	-3.9%	3.4%	3.5%	3.7%	-1.3%	4.6%	12.2%	1.6%	
Third/Second	3.2%	10.0%	-0.7%	2.9%	4.0%	1.7%	-3.3%	12.3%	-0.6%	2.9%	
Fourth/Third	-6.3%	7.7%	-0.5%	-0.3%	-1.5%	6.0%	3.5%	-16.9%	11.0%	-0.1%	
Latest/Fourth	-5.9%	0.1%	0.4%	0.5%	10.4%	8.4%	-0.1%	-3.2%	4.5%	1.0%	
Latest/First	0.7%	7.5%	-4.7%	6.5%	17.1%	21.1%	-1.4%	-5.5%	29.3%	5.5%	
99:I											
Second/First	13.9%	-5.0%	-15.3%	-8.1%	7.6%	-5.7%	-8.4%	34.3%	12.3%	-0.9%	
Third/Second	0.1%	-14.0%	0.8%	2.4%	-4.8%	0.7%	-1.3%	-2.8%	-0.1%	-1.7%	
Fourth/Third	-2.2%	-2.4%	0.2%	1.2%	4.4%	4.6%	34.7%	0.4%	10.9%	2.9%	
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/First	11.5%	-20.3%	-14.5%	-4.8%	6.9%	-0.7%	21.7%	31.1%	24.5%	0.2%	
99:II											
Second/First	-0.8%	-4.9%	1.9%	28.7%	-4.3%	1.3%	-2.1%	-6.0%	9.5%	0.3%	
Third/Second	-4.8%	-6.8%	-4.6%	-0.0%	0.1%	0.3%	17.4%	-1.2%	-1.2%	-2.1%	
Fourth/Third	3.1%	2.1%	-1.5%	1.1%	7.3%	-1.0%	0.0%	1.2%	-1.5%	0.7%	
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	
Latest/First	-2.7%	-9.5%	-4.2%	30.1%	2.8%	0.6%	14.9%	-6.0%	6.6%	-1.1%	
99:III											
Second/First	-9.6%	2.3%	-0.9%	0.2%	0.5%	-0.8%	1.3%	-0.2%	0.0%	-2.0%	
Third/Second	1.2%	3.9%	-0.4%	1.2%	8.6%	0.9%	0.0%	0.8%	-1.3%	1.1%	
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/First	-8.6%	6.3%	-1.2%	1.4%	9.2%	0.1%	1.3%	0.6%	-1.8%	-0.5%	
99:IV											
Second/First	-0.3%	7.1%	2.5%	2.9%	21.6%	-1.4%	0.0%	0.3%	-1.7%	2.4%	
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/First	-0.3%	7.1%	2.5%	2.9%	21.6%	-1.4%	0.0%	0.3%	-1.7%	2.4%	
Annual 99											
Second/First	0.8%	-0.3%	-3.3%	4.6%	6.4%	-1.7%	-2.3%	5.0%	4.6%	-0.0%	
Third/Second	-1.0%	-4.3%	-1.0%	0.8%	0.9%	0.5%	3.8%	-0.8%	-0.8%	-0.7%	
Fourth/Third	0.2%	-0.1%	-0.3%	0.5%	2.6%	0.9%	7.7%	0.4%	2.0%	0.9%	
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	
Latest/First	-0.0%	-4.7%	-4.6%	6.0%	10.2%	-0.5%	9.3%	4.0%	5.8%	0.1%	

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98-I											
Second/First	36.4%	-12.8%	15.4%	14.5%	-0.0%	18.8%	12.5%	81.0%	6.7%	18.2%	
Third/Second	6.9%	36.8%	2.2%	0.0%	7.9%	3.1%	-0.5%	1.5%	0.0%	6.9%	
Fourth/Third	0.1%	0.0%	-0.8%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.1%	
Latest/Fourth	-17.3%	-0.2%	8.3%	-1.0%	34.6%	10.9%	-4.3%	-17.7%	12.4%	0.7%	
Latest/First	20.1%	19.0%	26.6%	13.4%	45.2%	38.1%	7.2%	51.1%	19.9%	27.2%	
98-II											
Second/First	10.7%	14.4%	-10.4%	8.0%	7.9%	3.1%	-0.7%	3.1%	10.7%	3.0%	
Third/Second	-1.9%	-1.7%	6.2%	13.7%	-2.0%	2.1%	0.0%	26.0%	-2.0%	3.2%	
Fourth/Third	-16.6%	5.6%	-10.8%	-1.3%	-6.7%	-2.1%	-13.9%	-47.7%	8.2%	-12.0%	
Latest/Fourth	-5.4%	9.6%	2.5%	0.6%	22.5%	29.2%	3.9%	9.6%	10.4%	8.4%	
Latest/First	-14.3%	26.1%	-13.0%	21.8%	20.8%	33.2%	-11.2%	-25.3%	29.4%	1.5%	
98-III											
Second/First	-3.7%	-8.6%	6.3%	6.3%	-1.7%	3.4%	-1.9%	-14.3%	13.8%	-3.3%	
Third/Second	8.6%	14.5%	-8.3%	-1.0%	10.7%	2.1%	-12.4%	19.5%	-0.2%	2.5%	
Fourth/Third	-3.9%	6.7%	1.9%	-0.0%	0.0%	21.4%	14.2%	0.0%	16.4%	5.6%	
Latest/Fourth	-0.8%	-3.6%	-3.0%	0.9%	-4.0%	-0.1%	0.0%	0.0%	-0.1%	-1.6%	
Latest/First	-0.2%	7.6%	-3.7%	6.1%	4.6%	28.0%	-1.9%	-33.4%	34.4%	3.0%	
98-IV											
Second/First	9.8%	-24.3%	-17.4%	-8.2%	7.6%	-4.8%	-12.3%	37.8%	14.1%	-5.3%	
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Fourth/Third	-4.4%	18.9%	5.9%	0.0%	0.0%	1.5%	16.4%	0.0%	15.7%	5.0%	
Latest/Fourth	-1.3%	-3.6%	-3.3%	1.1%	-3.0%	-0.3%	0.0%	0.0%	-0.6%	-1.3%	
Latest/First	3.6%	-13.2%	-15.3%	-7.2%	4.4%	-3.7%	2.0%	37.8%	31.3%	-2.4%	
Annual 98											
Second/First	10.7%	-9.3%	-3.9%	3.4%	3.5%	3.7%	-1.3%	4.6%	12.2%	1.6%	
Third/Second	3.2%	10.0%	-0.7%	2.9%	4.0%	1.7%	-3.3%	12.3%	-0.6%	2.9%	
Fourth/Third	-6.3%	7.7%	-0.5%	-0.3%	-1.5%	6.0%	3.5%	-16.9%	11.0%	-0.1%	
Latest/Fourth	-5.9%	0.1%	0.4%	0.5%	10.4%	8.4%	-0.1%	-3.2%	4.5%	1.0%	
Latest/First	0.7%	7.5%	-4.7%	6.5%	17.1%	21.1%	-1.4%	-5.5%	29.3%	5.5%	
99-I											
Second/First	13.9%	-5.0%	-15.3%	-8.1%	7.6%	-5.7%	-8.4%	34.3%	12.3%	-0.9%	
Third/Second	0.1%	-14.0%	0.8%	2.4%	-4.8%	0.7%	-1.3%	-2.8%	-0.1%	-1.7%	
Fourth/Third	-2.2%	-2.4%	0.2%	1.2%	4.4%	4.6%	34.7%	0.4%	10.9%	2.9%	
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/First	11.5%	-20.3%	-14.5%	-4.8%	6.9%	-0.7%	21.7%	31.1%	24.5%	0.2%	
99-II											
Second/First	-0.8%	-4.9%	1.9%	28.7%	-4.3%	1.3%	-2.1%	-6.0%	9.5%	0.3%	
Third/Second	-4.8%	-6.8%	-4.6%	-0.0%	0.1%	0.3%	17.4%	-1.2%	-1.2%	-2.1%	
Fourth/Third	3.1%	2.1%	-1.5%	1.1%	7.3%	-1.0%	0.0%	1.2%	-1.5%	0.7%	
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	
Latest/First	-2.7%	-9.5%	-4.2%	30.1%	2.8%	0.6%	14.5%	-6.0%	6.6%	-1.1%	
99-III											
Second/First	-9.6%	2.3%	-0.9%	0.2%	0.5%	-0.8%	1.3%	-0.2%	0.0%	-2.0%	
Third/Second	1.2%	3.9%	-0.4%	1.2%	8.6%	0.9%	0.0%	0.8%	-1.3%	1.1%	
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/First	-8.6%	6.3%	-1.2%	1.4%	9.2%	0.1%	1.3%	0.6%	-1.8%	-0.9%	
99-IV											
Second/First	-0.3%	7.1%	2.5%	2.9%	21.6%	-1.4%	0.0%	0.3%	-1.7%	2.4%	
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Latest/First	-0.3%	7.1%	2.5%	2.9%	21.6%	-1.4%	0.0%	0.3%	-1.7%	2.4%	
Annual 99											
Second/First	0.8%	-0.3%	-3.3%	4.6%	6.4%	-1.7%	-2.3%	5.0%	4.6%	-0.0%	
Third/Second	-1.0%	-4.3%	-1.0%	0.8%	0.9%	0.5%	3.8%	-0.8%	-0.8%	-0.7%	
Fourth/Third	0.2%	-0.1%	-0.3%	0.5%	2.6%	0.9%	7.7%	0.6%	2.0%	0.9%	
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	
Latest/First	-0.0%	-4.7%	-4.6%	6.0%	10.2%	-0.5%	9.3%	4.0%	5.8%	0.1%	

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Table A.5
GDP Deflator

	Agriculture	Mining	Industry	EGW	Construction	Trade	Transport	Finance	Services	GDP
96:I										
First	143	116	125	134	119	120	132	138	140	126
Second	145	112	129	135	119	126	113	125	123	126
Third	136	116	130	135	118	126	142	120	123	125
Fourth	136	116	130	135	118	126	112	120	123	125
Latest	135	116	133	146	118	120	112	126	123	126
96:II										
First	146	117	128	137	117	123	122	121	119	127
Second	146	115	131	136	122	126	122	123	119	128
Third	139	119	132	136	122	126	120	118	125	128
Fourth	139	119	132	136	122	126	120	118	125	128
Latest	139	119	132	136	122	126	120	118	125	128
96:III										
First	141	115	131	137	126	127	119	124	126	128
Second	138	122	133	137	125	127	118	119	126	128
Third	138	122	133	137	125	127	118	119	126	128
Fourth	140	122	134	142	125	125	118	121	126	129
Latest	140	122	134	142	125	125	118	121	126	129
96:IV										
First	113	119	132	137	146	135	122	121	135	128
Second	140	132	134	137	144	133	120	117	132	135
Third	140	132	134	137	144	133	120	117	132	135
Fourth	143	131	134	142	144	130	120	120	132	133
Latest	143	131	134	142	144	130	120	120	132	133
Annual 96										
First	137	117	129	136	127	126	119	121	130	127
Second	142	120	132	136	128	128	118	121	125	129
Third	138	122	133	136	128	128	118	119	126	129
Fourth	139	122	133	139	128	127	118	120	126	129
Latest	139	122	133	141	128	125	118	121	126	129
97:I										
First	160	119	133	138	124	134	121	130	133	134
Second	152	131	139	137	131	135	120	129	126	136
Third	151	132	140	137	89	136	118	126	129	132
Fourth	150	132	143	142	123	134	120	132	124	136
Latest	151	137	153	143	124	129	120	132	132	139
97:II										
First	155	124	139	137	135	138	127	129	140	138
Second	156	123	140	137	145	137	129	125	142	139
Third	153	124	140	136	145	136	128	134	142	139
Fourth	154	123	142	142	131	135	128	136	140	139
Latest	154	127	153	141	132	130	119	136	133	141
97:III										
First	153	171	149	138	149	143	134	127	145	147
Second	153	171	149	138	149	143	134	127	145	147
Third	157	132	145	143	134	141	136	148	144	144
Fourth	159	135	154	142	134	137	121	148	152	145
Latest	159	135	154	142	134	137	121	148	152	145
97:IV										
First	168	197	158	148	158	155	144	129	155	158
Second	168	197	158	148	158	155	144	129	155	158
Third	163	180	155	151	139	154	141	181	148	158
Fourth	165	177	164	148	139	145	125	146	153	154
Latest	165	177	164	148	139	145	125	146	153	154
Annual 97										
First	159	153	145	140	142	143	132	128	143	144
Second	157	156	147	140	145	143	132	127	142	145
Third	156	142	145	142	126	142	131	149	141	143
Fourth	156	142	151	143	132	138	123	141	142	144
Latest	157	144	156	143	132	135	121	141	148	145

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98:I										
First	189	280	169	142	189	165	138	137	139	171
Second	236	244	202	160	189	196	155	246	158	206
Third	252	325	214	155	255	237	178	247	153	230
Fourth	255	320	199	159	216	199	191	269	158	219
Latest	216	311	205	157	246	213	151	217	171	214
98:II										
First	265	298	279	182	231	230	205	318	184	255
Second	288	334	259	182	249	233	200	354	208	264
Third	307	317	254	207	257	226	208	445	193	269
Fourth	341	323	203	200	220	223	193	235	209	228
Latest	250	364	232	205	264	287	186	255	231	257
98:III										
First	313	390	314	210	259	263	208	363	183	292
Second	309	362	317	218	273	265	209	261	212	286
Third	315	403	273	216	301	264	190	256	209	280
Fourth	303	439	278	216	301	320	217	256	243	295
Latest	299	417	269	216	297	320	217	256	244	291
98:IV										
First	325	391	345	222	384	301	215	254	195	304
Second	345	288	287	219	308	303	195	270	217	284
Third	345	288	291	219	308	303	195	270	217	285
Fourth	329	342	308	219	308	307	227	270	251	300
Latest	325	334	294	219	302	304	227	270	253	294
Annual 98										
First	264	341	275	190	239	238	189	263	175	253
Second	292	307	266	195	252	247	188	282	199	259
Third	303	333	259	200	281	254	193	302	193	266
Fourth	280	354	246	199	260	260	194	258	216	259
Latest	272	356	250	200	275	278	193	248	228	263
99:I										
First	323	352	351	223	290	321	227	272	209	309
Second	362	334	300	221	336	316	216	280	223	303
Third	357	284	297	219	310	307	212	270	222	293
Fourth	346	277	295	219	318	311	286	270	251	299
Latest	346	277	295	219	318	311	286	270	251	299
99:II										
First	358	326	302	186	357	316	219	298	259	307
Second	360	314	302	219	311	308	219	277	286	305
Third	342	293	288	219	312	309	256	274	283	298
Fourth	353	297	280	219	325	303	254	275	283	298
Latest	353	297	280	219	325	303	254	275	283	298
99:III										
First	346	288	301	220	311	305	225	274	260	296
Second	313	294	299	220	313	302	228	274	260	290
Third	320	306	292	219	329	304	225	274	260	292
Fourth	320	306	292	219	329	304	225	274	260	292
Latest	320	306	292	219	329	304	225	274	260	292
99:IV										
First	308	299	293	221	313	306	226	272	247	287
Second	311	343	297	221	355	307	226	271	247	296
Third	311	343	297	221	355	307	226	271	247	296
Fourth	311	343	297	221	355	307	226	271	247	296
Latest	311	343	297	221	355	307	226	271	247	296
Annual 99										
First	335	316	311	213	317	312	224	279	245	300
Second	338	321	299	220	329	308	222	276	254	298
Third	334	306	294	220	327	307	230	272	253	295
Fourth	334	306	291	220	332	306	247	273	260	296
Latest	334	306	291	220	332	306	247	273	260	296

Note: underlined numbers are the same as the previous estimates because new estimates are not yet available

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Table A.6
Percentage Change in Estimates

	Agriculture	Mining	Industry	ECW	Construction	Trade	Transport	Finance	Services	GDP
96:I										
Second/First	0.0%	-3.2%	3.2%	1.0%	-0.0%	4.7%	0.9%	5.2%	-12.1%	0.5%
Third/Second	-5.9%	2.8%	1.2%	0.1%	-0.7%	-0.0%	-1.1%	-3.8%	0.1%	-0.5%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	-0.4%	-0.0%	2.2%	7.8%	0.0%	-4.3%	-0.0%	4.0%	-0.0%	0.3%
Latest/First	-6.3%	-0.4%	6.8%	9.1%	-0.7%	0.3%	-0.2%	6.9%	-12.1%	-0.0%
96:II										
Second/First	0.0%	-1.6%	2.3%	-0.7%	4.7%	2.4%	-0.7%	2.1%	0.0%	1.3%
Third/Second	-4.8%	1.5%	0.8%	0.1%	-0.1%	-0.0%	-1.0%	-4.1%	4.7%	-0.4%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-4.8%	1.9%	3.2%	-0.6%	4.6%	2.4%	-1.7%	-2.1%	4.7%	0.8%
96:III										
Second/First	-1.5%	6.1%	1.7%	0.1%	-0.7%	-0.1%	-1.1%	-3.3%	-0.3%	0.1%
Third/Second	-0.0%	-0.0%	0.0%	0.0%	-0.0%	-0.0%	0.0%	-0.0%	-0.0%	-0.0%
Fourth/Third	1.4%	0.0%	0.3%	3.7%	0.0%	-2.1%	-0.0%	1.3%	0.0%	0.2%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-0.1%	6.1%	1.9%	3.8%	-0.7%	-2.2%	-1.1%	-2.3%	-0.3%	0.2%
96:IV										
Second/First	23.4%	10.8%	1.3%	-0.3%	-1.2%	-0.1%	-1.1%	-3.5%	-2.3%	3.2%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fourth/Third	2.1%	-0.4%	0.2%	3.7%	0.0%	-2.1%	0.0%	2.2%	-0.0%	0.1%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	26.0%	10.4%	1.5%	3.3%	-1.2%	-2.2%	-1.1%	-1.4%	-2.3%	3.3%
Annual 96										
Second/First	3.7%	3.2%	2.1%	-0.0%	0.4%	1.6%	-0.5%	0.1%	-3.9%	1.3%
Third/Second	-2.9%	1.5%	0.5%	0.1%	-0.2%	-0.0%	-0.5%	-2.0%	1.1%	-0.3%
Fourth/Third	0.8%	-0.1%	0.1%	2.0%	0.0%	-1.1%	-0.0%	0.9%	0.0%	0.1%
Latest/Fourth	-0.1%	-0.0%	0.5%	1.8%	0.0%	-1.0%	-0.0%	1.0%	-0.0%	0.1%
Latest/First	1.5%	4.6%	3.2%	3.8%	0.2%	-0.5%	-1.0%	-0.0%	-2.8%	1.1%
97:I										
Second/First	-5.2%	10.8%	4.0%	-1.3%	5.6%	0.6%	-0.7%	-1.1%	-4.8%	1.2%
Third/Second	-0.6%	0.2%	0.2%	0.1%	-32.4%	0.5%	-2.1%	-2.4%	2.1%	-2.8%
Fourth/Third	-0.5%	-0.1%	2.5%	3.8%	38.5%	-1.1%	1.8%	5.3%	-3.5%	2.8%
Latest/Fourth	0.8%	3.8%	6.7%	-0.4%	0.3%	-4.0%	0.4%	0.0%	-6.0%	2.1%
Latest/First	-5.4%	15.2%	14.9%	2.1%	-0.5%	-4.1%	-0.6%	1.7%	-0.6%	3.3%
97:II										
Second/First	0.7%	-0.9%	1.0%	0.1%	5.2%	-1.0%	1.5%	-2.7%	1.4%	0.5%
Third/Second	-1.8%	0.6%	0.0%	-0.7%	1.7%	-0.5%	-0.5%	7.4%	0.0%	0.4%
Fourth/Third	0.9%	-0.7%	1.7%	4.4%	-9.4%	-0.6%	0.0%	1.1%	-1.5%	-0.3%
Latest/Fourth	-0.3%	3.4%	7.5%	-0.9%	0.2%	-3.7%	-7.4%	0.0%	10.0%	1.7%
Latest/First	-0.5%	2.4%	10.4%	2.5%	-2.9%	-5.7%	-6.4%	5.7%	9.9%	2.3%
97:III										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	2.9%	-22.8%	-2.8%	3.2%	-10.0%	-1.0%	1.7%	17.1%	-0.9%	-2.1%
Fourth/Third	0.9%	2.5%	6.3%	-0.6%	0.2%	-2.9%	-10.9%	-0.0%	5.5%	1.3%
Latest/Fourth	0.0%	-0.0%	-0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	0.0%	-0.0%
Latest/First	3.8%	-20.9%	3.3%	2.5%	-9.8%	-3.9%	-9.4%	17.0%	4.6%	-0.9%
97:IV										
Second/First	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Third/Second	-3.3%	-8.3%	-1.4%	1.8%	-12.2%	-1.2%	-2.4%	40.7%	-4.7%	-0.3%
Fourth/Third	1.1%	-2.0%	5.7%	-2.0%	0.2%	-5.9%	-11.4%	-19.2%	3.6%	-2.4%
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%
Latest/First	-2.3%	-10.1%	-1.2%	-0.2%	-12.1%	-7.0%	-13.5%	13.6%	-1.3%	-2.7%
Annual 97										
Second/First	-1.2%	2.0%	1.2%	-0.3%	2.5%	-0.1%	0.2%	-1.0%	-0.7%	0.4%
Third/Second	-0.7%	-8.7%	-1.1%	1.1%	-13.0%	-0.6%	-0.8%	17.3%	-1.1%	-1.1%
Fourth/Third	0.0%	-0.2%	4.2%	1.2%	4.4%	-2.8%	-5.6%	-5.5%	1.3%	0.2%
Latest/Fourth	0.1%	1.6%	3.2%	-0.3%	0.1%	-1.7%	-1.8%	0.0%	3.7%	0.9%
Latest/First	-1.2%	-5.6%	7.5%	1.7%	-6.9%	-5.1%	-7.8%	9.8%	3.1%	0.3%

October 17, 2000

Revision of Quarterly Production Accounts

98:I										
Second/First	39.5%	-12.8%	20.0%	13.1%	-0.0%	18.8%	12.5%	78.9%	13.8%	20.3%
Third/Second	6.8%	33.3%	5.9%	-3.1%	35.0%	15.6%	14.7%	0.8%	-3.2%	11.6%
Fourth/Third	1.1%	-1.7%	-7.1%	2.2%	-15.2%	-12.1%	-14.9%	8.9%	3.3%	-4.8%
Latest/Fourth	-15.2%	-2.8%	2.5%	-1.1%	13.5%	6.6%	-0.3%	-19.2%	8.7%	-2.2%
Latest/First	27.5%	11.1%	21.4%	10.8%	30.4%	28.7%	9.6%	58.1%	23.7%	25.1%
98:II										
Second/First	8.7%	12.2%	-7.1%	0.2%	8.1%	1.7%	-2.3%	11.1%	13.2%	3.7%
Third/Second	6.6%	-5.1%	-1.7%	13.5%	3.2%	-3.3%	4.0%	25.8%	-7.3%	2.0%
Fourth/Third	-21.4%	1.7%	-20.4%	-3.8%	-14.3%	-1.3%	-7.2%	-47.1%	8.1%	-15.5%
Latest/Fourth	3.8%	12.8%	14.4%	2.5%	20.1%	28.6%	-3.6%	8.2%	10.8%	12.8%
Latest/First	-5.5%	22.1%	-16.9%	12.6%	14.7%	24.9%	-9.1%	-20.0%	25.7%	6.9%
98:III										
Second/First	-1.2%	-7.4%	0.8%	3.8%	5.4%	0.6%	0.5%	-27.3%	15.8%	-2.1%
Third/Second	2.0%	13.3%	-13.8%	-0.7%	10.1%	-0.5%	-9.0%	-3.1%	-1.8%	-2.3%
Fourth/Third	-3.9%	6.7%	1.9%	0.6%	0.0%	21.4%	14.2%	-0.0%	16.4%	8.6%
Latest/Fourth	-1.4%	-3.0%	-3.2%	0.0%	-1.1%	0.0%	0.0%	0.0%	0.6%	-1.5%
Latest/First	-4.5%	6.8%	-14.3%	3.2%	14.4%	21.6%	4.4%	-29.5%	33.3%	-0.4%
98:IV										
Second/First	5.9%	-26.4%	-16.8%	-1.3%	8.5%	0.6%	-9.0%	6.5%	11.0%	-6.5%
Third/Second	-0.0%	0.0%	1.3%	0.0%	-0.0%	0.0%	-0.0%	0.0%	0.0%	0.3%
Fourth/Third	-4.4%	18.9%	5.9%	0.0%	0.0%	1.5%	16.4%	0.0%	15.7%	5.0%
Latest/Fourth	-1.3%	-2.4%	-4.5%	-0.0%	-1.7%	-1.1%	0.0%	0.0%	0.7%	-1.5%
Latest/First	-0.1%	-14.6%	-14.8%	-1.3%	6.6%	1.0%	5.9%	6.5%	29.4%	-3.4%
Annual 98										
Second/First	10.6%	-10.1%	-3.2%	2.7%	5.5%	4.1%	-0.3%	7.1%	13.8%	2.2%
Third/Second	3.7%	8.4%	-2.9%	2.2%	11.5%	2.8%	2.5%	7.0%	-3.1%	2.7%
Fourth/Third	-7.4%	6.3%	-4.8%	-0.1%	-7.1%	2.2%	0.7%	-14.5%	11.8%	-2.4%
Latest/Fourth	-3.2%	0.7%	1.3%	0.5%	5.7%	6.9%	-0.7%	-4.1%	4.3%	1.2%
Latest/First	2.8%	4.2%	-9.3%	5.6%	15.0%	16.8%	2.1%	-6.0%	28.7%	-3.7%
99:I										
Second/First	11.1%	-5.1%	-14.6%	-1.1%	15.8%	-1.6%	-4.8%	3.0%	6.5%	-1.8%
Third/Second	-1.5%	-15.1%	-0.9%	-0.7%	-7.6%	-2.7%	-1.5%	-3.4%	-0.2%	-3.3%
Fourth/Third	-3.0%	-2.5%	-0.8%	-0.0%	2.4%	1.2%	34.1%	-0.1%	12.8%	1.9%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	6.4%	-21.4%	-16.1%	-1.5%	9.5%	-3.1%	26.0%	-0.7%	20.0%	-3.2%
99:II										
Second/First	0.3%	-3.7%	-0.1%	18.2%	-12.9%	-2.6%	-0.3%	-6.8%	10.4%	-0.9%
Third/Second	-4.8%	-6.8%	-4.6%	-0.0%	0.1%	0.3%	17.4%	-1.2%	-1.2%	-2.1%
Fourth/Third	3.1%	1.7%	-2.8%	-0.0%	4.4%	-2.0%	-1.1%	0.5%	0.3%	0.0%
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%
Latest/First	-1.6%	-8.7%	-7.3%	18.2%	-8.9%	-4.3%	15.8%	-7.5%	9.4%	-3.0%
99:III										
Second/First	-9.6%	2.3%	-0.9%	0.2%	0.3%	-0.8%	1.3%	-0.2%	0.0%	-2.0%
Third/Second	2.2%	3.9%	-2.0%	-0.4%	5.1%	0.5%	-1.2%	-0.0%	-0.0%	0.6%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	-7.6%	6.2%	-2.5%	-0.1%	5.6%	-0.3%	0.0%	-0.2%	-0.0%	-1.4%
99:IV										
Second/First	0.7%	14.8%	1.6%	-0.1%	15.5%	0.3%	0.0%	-0.3%	0.0%	3.0%
Third/Second	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%
Fourth/Third	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/Fourth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Latest/First	0.7%	14.8%	1.6%	-0.1%	15.5%	0.3%	0.0%	-0.3%	0.0%	3.0%
Annual 99										
Second/First	0.7%	1.8%	-3.8%	3.4%	4.0%	-1.2%	-0.9%	-1.3%	4.0%	-0.4%
Third/Second	-1.2%	-4.6%	-1.9%	-0.3%	-0.6%	-0.4%	3.5%	-1.2%	-0.4%	-1.2%
Fourth/Third	-0.0%	-0.2%	-0.9%	-0.0%	1.5%	-0.2%	7.4%	0.1%	2.5%	0.5%
Latest/Fourth	0.0%	-0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.0%
Latest/First	-0.5%	-3.1%	-6.4%	3.2%	4.9%	-1.8%	10.1%	-2.4%	6.5%	-1.2%

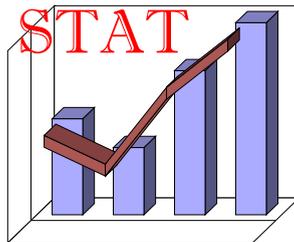
THE MONTHLY MANUFACTURING PRODUCTION SURVEY

Statistical Paper # 2
Report # 15

by

**Yahya Jammal
Rosniaty Ismail**

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The Monthly Manufacturing Production Survey

EXECUTIVE SUMMARY

Since 1986 BPS has relied on a quarterly survey of medium and large manufacturing establishments for computing quarterly manufacturing GDP. With the increasing prominence of the manufacturing sector following the government's drive for rapid industrialization in the late 1980s, this sector's developments have become one of the most critical components in computing the country's production side of the GDP. Following the severe economic crisis in 1998, Indonesian policy makers decided that, for the purpose of detecting and reacting to potential macroeconomic crises such as that of 1998, the country needed quicker indicators of economic activity. In compliance with the International Monetary Fund's (IMF) Special Data Dissemination Standards (SDDS), BPS designed a new quarterly manufacturing production *system* along the same lines as the existing quarterly production survey, but with a monthly *sub-system* which aimed at measuring aggregate changes (i.e. at the one-digit ISIC level). This report describes the new monthly sub-system and evaluates plausibility of its results.

The main features of the monthly sub-system are:

- a. The sample is small (195 establishments) and located primarily in JABOTABEK. It was designed to be representative at the one-digit ISIC level.
- b. The questionnaire uses a shuttle form to speed processing and enhance consistency of reporting.
- c. The computation methodology involves calculating an establishment index based on individual commodity growth, then aggregating these indices into one manufacturing sector index.
- d. The management of the survey (including data collection) is conducted primarily by the BPS Head Office rather than regional offices, and relies primarily on email and fax communications rather than on personal visits by Mantris.

This survey, which started in January 2000, has so far been an impressive success: it has obtained response which allows publication of a preliminary figure within six weeks of the end of a reference month (as the IMF's SDDS require) and its results are plausible. However, experience to date suggests that success in obtaining response can only be achieved with vigorous and relentless efforts by the staff responsible for the survey and by the readiness of higher level officials to be intimately involved.

The main recommendations of the report can be briefly stated as follows:

- a. Continue the current aggressive policy for obtaining response, to ensure that the progress achieved to date does not slow down.
- b. Develop a system which can ensure high response. One possibility to consider is to incorporate the monthly response rate as one indicator in the performance evaluation of the sub-division, division and bureau chiefs.
- c. Evaluate regularly the plausibility of the monthly survey results and their consistency with other data sources.
- d. Evaluate the possibility of using this survey as a model for future establishment surveys in which timeliness is critical.
- e. Turn the current Quarterly sub-system into a monthly survey.

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I. INTRODUCTION

Since 1986 BPS has relied on a quarterly survey of medium and large manufacturing establishments for computing quarterly manufacturing GDP. With the increasing prominence of the manufacturing sector following the government's drive for rapid industrialization in the late 1980s, this sector's developments have become one of the most critical components in computing the country's production side of the GDP. Following the severe economic crisis in 1998, Indonesian policy makers decided that, for the purpose of detecting and reacting to potential macroeconomic crises such as that of 1998, the country needed quicker indicators of economic activity. In compliance with the International Monetary Fund's (IMF) Special Data Dissemination Standards (SDDS), BPS decided to experiment with ways to produce such prompt indicators. One attempt in 1998 was to rely solely on electricity consumption¹, but was dropped mainly because of the belief that a production-based indicator would be more appropriate than one based solely on a particular input.

BPS then designed a new quarterly manufacturing production *system* along the same lines as the existing quarterly production survey, but with a monthly *sub-system* which aimed at measuring aggregate changes (i.e. at the one-digit ISIC level). By limiting its representation to aggregate changes in production, the new monthly sub-system could be conducted with a much smaller sample and response would be much timelier. A new set of operational procedures (based on email and faxes, and run directly from the head office) and a new type of questionnaire (a shuttle form) were designed. Early pre-tests indicated that it was feasible to obtain adequate response within the six-week lag dictated by the SDDS.

The new quarterly system started in January 2000, with its monthly sub-system to be pilot-tested during that year. This report provides a description of the new monthly sub-system that is being tested, discusses its progress to date and evaluates plausibility of its results.

II. SYSTEM DESCRIPTION

The quarterly *system* of manufacturing production indices, which BPS started implementing in the first quarter of 2000, has two inter-related components:

- a. The first is a *quarterly* manufacturing production index based on a sample of 992 establishments taken from the 1996 Annual Industry Survey. To provide adequate representation for economic policy makers as well as for National Accounts estimation, the sample was designed to be representative by 3-digit ISIC.

¹ Korns, Alex, "Toward a Prompt Monthly Index of Industrial Production," Final Report, Nathan Associates, Inc., February, 1999.

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b. The second component is a *monthly* manufacturing production index based on a sub-sample of 195 establishments taken from the above *quarterly* sample. The main purpose of this activity was to comply with the IMF's SDDS, namely to provide a timely index for aggregate manufacturing production. That is why this sample was designed to be representative by 1-digit ISIC only.

A. Sample

The sampling frame used was the 1996 Annual Manufacturing Survey, which was the latest available at the time of sample selection in the third quarter of 1999. The monthly sample contains 195 establishments, representing 37% of total output in the population, or 39% of the output of surviving establishments at the time of selection. Of these, 138 were already in the quarterly survey conducted since 1993 and 103 were located in, or had their central office in, the Jakarta metropolitan area (JABOTABEK), which should in principle greatly facilitate data collection and follow up by the BPS Head Office.

Table 1
Number of Establishments in the Monthly Sample Located, or Which Have a Central Office Located, in JABOTABEK

Establishment Location	Number of Establishments
DKI Jakarta	42
Jawa Barat	45
Jawa Tengah	3
Jawa Timur	5
Kalimantan Timur	1
Kalimantan Selatan	1
Maluku	2
Riau	2
Sumatera Utara	1
Sulawesi Utara	1
Total	103

The provincial distribution of the remaining establishments is provided in Table 2. Note that 62% of these were located in three provinces (Jawa Timur, Jawa Barat and Jawa Tengah), a concentration which should also facilitate data collection.

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Table 2
Number of Establishments in the Monthly Sample
Located Outside, and With no Head Office in, JABOTABEK

Establishment Location	Number of Establishments
Aceh	1
Sumatera Utara	9
Sumatera Barat	1
Riau	5
Jambi	3
Sumatera Selatan	4
Lampung	2
Jawa Barat	21
Jawa Tengah	13
Yogyakarta	2
Jawa Timur	23
Kalimantan Barat	1
Kalimantan Timur	3
Sulawesi Utara	1
Sulawesi Selatan	1
Maluku	2
Total	92

B. Questionnaire

The monthly sub-system uses a shuttle form to speed processing and enhance consistency of reporting, which allows computation of monthly indices for a full calendar year (see a prototype form in Figure 2 and a complete form in Appendix A). The same form is expected to “shuttle” back and forth between BPS and the establishment by way of fax or email. A different form would be used every calendar year.

Figure 2
Sample Questionnaire for the Monthly Survey

PRODUCTION AND TOTAL EMPLOYMENT PER MONTH									
No	Type of Product	Description	Unit	1999	2000				
				December	January	February	.....	November	December
(1)	(2)	(3)	(4)	(5)	(6)	(7)	.....	(16)	(17)
1.		Quantity							
		Value	million Rp						
		Price/Unit							
2.		Quantity							
		Value	million Rp						
		Price/Unit							
.....									
.....									
6.		Quantity							
		Value	million Rp						
		Price/Unit							
7.	Other ^{*)}	Value	million Rp						
8.	Tot. quantity								
9.	Tot. value	Value	million Rp						
10.	Employees	Person							

^{*)} If the value of production of several commodities is less than 2% of the total value of production, please classify these under "Other" (No. 7).

C. Computation Methodology

Just like the current quarterly survey, data obtained from establishments in the monthly sub-system are used to compute both a quantity and a unit value index. Very briefly, the methodology is as follows (Appendix B provides various formulas used in the programs):

- a. First, commodity growth factors between two consecutive months are computed for every establishment.²

² Since growth factors can only be computed for commodities produced in both months, commodities produced in only one of the two consecutive months are ignored.

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b. An establishment index is then calculated, aggregating commodity growth factors by using their relative Divisia weights.³

c. Establishment indices are then aggregated directly to the 1-digit ISIC level (using combined sampling and Divisia weights) to produce a total monthly index for the whole manufacturing sector. In doing so, non-respondents are assumed to behave in the same way as respondents. Two types of adjustment for non-response are made: one for those selected with certainty and one for those selected with probability less than one. For the former establishments, sampling weights of respondents are adjusted by multiplying them by a ratio of measure of size⁴. Sampling weights for the remaining respondents are multiplied by the inverse of the response rate (of establishments selected with probability less than one) for that particular month.

III. IMPLEMENTATION

A. Management

As the monthly sub-system was a new survey, and since its questionnaire and procedures were different from those established and used in the past (namely, the use of a shuttle form rather than different new forms every collection period, and all stages -- from establishing initial contact to index computation-- being handled by the head office instead of going through provincial offices), the operational system has undergone several changes dictated by realities in the field. The operational system described in this section is the one used currently. Modifications and improvements may continue to be introduced in the future as needs arise.

The operational system can be divided into five stages:

1. Sending Questionnaire

This includes communication with the establishment, providing it with the initial questionnaire. It involves emailing, faxing or in very few cases, mailing of the questionnaire.⁵ As Table 3 shows, 98% of establishments can be contacted by email and fax, which makes it possible to obtain adequate timely response. The likelihood of obtaining timely response from those mail communications is low, but with only four establishments in this category, they do not

³ These weights represent average relative output value shares of various commodities produced by the establishment for the two-month period in question.

⁴ That is, the ratio of total 1996 output of all establishments (selected with certainty) to total 1996 output of actual respondents (selected with certainty) in that particular month.

⁵ A copy of all questionnaires sent to establishments is emailed to the relevant provincial offices to update them in case their help is needed in obtaining prompt response.

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warrant particular attention.

Table 3
Communications Medium Used in the Survey

Medium	Number of Establishments
Email	74
Fax	117
Mail	4
Total	195

2. Follow Up With Establishments

Regardless of the form of communication with the establishment, after the initial contact is made, a telephone contact is initiated by the BPS Head Office (after two weeks of the end of a particular month) to remind the establishment that response is due. This is the most time consuming and labor intensive stage and it is repeated month after month. It involves twelve staff members, one subdivision chief and, when necessary, one division and/or bureau chief. The process involves the following steps:

- Eight staff, each responsible for contacting an average of thirteen establishments in JABOTABEK⁶, makes three attempts. If all attempts fail, then
- one of the four coordinators (who are more senior staff) makes three attempts of their own to obtain response. If all attempts fail, then
- the subdivision chief makes three attempts. If that fails, then
- the division chief makes three attempts. If that fails, then
- the bureau chief makes three attempts.

If all the above fails, i.e. after fifteen attempts are made to contact the establishment, then nothing further is (or can realistically be) done. If that occurs, the establishment is considered a non-respondent and its data are estimated.

⁶ Ideally, all establishments in the survey should be contacted by phone. However, budgetary constraints have dictated that regular monthly phone calls be limited to JABOTABEK. Thirty additional establishments, located outside JABOTABEK, are also contacted regularly by the BPS staff through email.

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3. Receipt of Questionnaire

Once a questionnaire is received, different processing procedures are applied depending on the form in which the data are received:

- a. Emailed data: if the format in which data are received is the same as that used by BPS for this survey then an acknowledgment is sent back to the establishment. If the format is different, it is then converted to the (spreadsheet) format used for this survey and sent back to the establishment with a request that the establishment use it in its subsequent reporting.
- b. Faxed data: data are entered then faxed back only to establishments that request it when they are called in the subsequent month.⁷
- c. Mailed data: data are entered then mailed back to the establishment.

Sending back the data forms serves two important purposes: it represents an acknowledgment of receipt and it keeps open communications channels with establishments.

4. Data Entry & Editing

Data received or entered in spreadsheet format are re-entered in SAS twice then compared and corrected, as is done in the current Quarterly Survey.⁸ Data are then edited following the same procedures used in the Quarterly Survey, which primarily evaluate the plausibility of levels as well as changes in quantities and implicit unit values.

5. Computation & Evaluation

Computations are automated (relevant SAS programs are included in Appendix C). Three sets of printout are produced:

- a. Response: two tables (produced by a spreadsheet file) showing the response rate by provincial location are produced, one providing the rate as a share of the number of establishments and the other providing the rate as a share of total output. The tables

⁷ Again, every received fax should ideally be faxed back to the establishment as a confirmation of receipt of the latest data. However, budgetary limitations have not allowed it so far.

⁸ The subdivision responsible for managing this survey is in the process of completing an automated procedure for converting spreadsheet data into SAS, the program used for index computation as well as data entry and computation of the Quarterly Survey. Once that procedure is completed, it will be applied regularly, thus avoiding manual re-entry of data into SAS.

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are produced daily in order to monitor progress and identify areas which need particular attention.

b. Index: three aggregate manufacturing indices are produced (using SAS), a value index, a quantity index and a unit value index. The quantity index is the one made available for publication.

c. Outliers: a list of outlying observations is also produced (by the SAS programs).⁹ The purpose of this list is to allow survey editors to evaluate plausibility of these numbers. Truly extreme observations within this range will be evaluated by the survey manager, who would normally contact the establishment in question and discuss the accuracy of reported figures.

B. Response

The survey began in January, 2000. As Table 4 shows, response in the first few months of operation was very disappointing. Two reasons can be advanced for the low response rate:

a. The survey was new, was run directly from the BPS Head Office and involved different operational procedures than had been used in the past;

b. All units of BPS, whether in the Head Office or the provincial offices, were preoccupied with the 2000 Population Census. As is the case whenever any nationwide census is conducted (whether Population, Economic or Agriculture), a substantial proportion of staff (and managerial) time was devoted to this activity at the expense of all other activities.

⁹ Outliers are defined as observations which involve monthly establishment growth beyond the limits placed in the program. Placing limits was necessary in order to improve stability of the results by reducing the influence of outlying observations. Three types of limits were placed in the program (see Appendix B for specific terms subjected to various limits):

a. Commodity growth: a range was placed implying a maximum monthly commodity growth of 12 times and a maximum monthly decline of 92%.

b. Establishment growth: a range of 1.75 and 0.25 was placed to limit sharp unsustainable movements which are often caused by data errors. This range implies a maximum monthly establishment growth of 75% and a maximum monthly decline of 75%.

c. Establishment weight: a range of 2 and 1/10 was placed on the weighted value of a particular establishment to reduce the impact of extreme values caused by errors in the frame or by substantial seasonal swings. This range implies that the establishment could not have a weighted value greater than twice (or less than 1/10) the value expected on the basis of its relative measure of size in the sampling frame, taking into account the effect of average growth since the time of sample selection.

Apart from the removal of very extreme values, these limits did not affect the estimated growth rates significantly. On average only 6% of monthly respondents were affected.

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Even after visits by the head office staff started (in April), response remained low. Only with active daily monitoring of follow up calls by the survey manager (following intervention by the Industry Bureau Chief himself) did response begin to rise steadily to acceptable levels. Based on the progress to date, the survey manager's target for response is: 20%-25% after one month, which will allow publication of a preliminary figure, and 50% after three months for the publication of a final figure.¹⁰ Annual revisions of the monthly series may be undertaken if warranted.

Table 4
Progress of the Response Rate to the Monthly Survey
(As of the end of October 2000)

	January	February	March	April	May	June	July	August	Sept.
After 1 month	<i>3%</i>	<i>3%</i>	<i>2%</i>	11%	7%	18%	17%	13%	20%
After 2 months	<i>3%</i>	<i>5%</i>	17%	18%	25%	43%	27%	32%	
After 3 months	<i>4%</i>	14%	25%	33%	45%	50%	41%		
After 4 months	14%	22%	38%	48%	54%	58%			
After 5 months	21%	39%	53%	58%	62%				
After 6 months	42%	53%	61%	65%					
After 7 months	55%	61%	67%						
After 8 months	63%	67%							
After 9 months	68%								

Note: numbers in italics refer to results before field visits by the head office staff and numbers in bold type refer to results immediately following the first set of visits.

Table 5 shows the response rate by province relative to the number of establishments, and Table 6 shows the output share of respondents.

¹⁰ If improvement in response continues at the same rate, then the target lag for publication of a final figure may be shortened.

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Table 5
Number and Share of Respondents by Province
(As of the end of October 2000)

Province	# est	January		February		March		April		May		June		July		August		Sept.	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Aceh	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sumut	10	4	40	4	40	4	40	4	40	4	40	3	30	2	20	2	20	2	20
Sumbar	1	1	100	1	100	1	100	1	100	1	100	1	100	1	100	1	100	1	100
Riau	7	5	71	5	71	5	71	5	71	4	57	4	57	2	29	2	29	0	0
Jambi	3	2	67	2	67	2	67	2	67	2	67	2	67	0	0	0	0	0	0
Sumsel	4	4	100	4	100	4	100	3	75	3	75	3	75	2	50	2	50	0	0
Lampung	2	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100
DKI	42	33	79	32	76	32	76	31	74	29	69	27	64	20	48	16	38	11	26
Jabar	66	43	65	43	65	43	65	43	65	41	62	38	58	26	39	18	27	12	18
Jateng	16	12	75	12	75	12	75	9	56	8	50	8	50	5	31	2	13	1	6
Yogya	2	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100
Jatim	28	18	64	18	64	18	64	18	64	18	64	18	64	13	46	10	36	6	21
Kalbar	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kalsel	1	1	100	1	100	1	100	1	100	1	100	1	100	1	100	1	100	1	100
Kaltim	4	3	75	3	75	3	75	3	75	3	75	3	75	3	75	3	75	1	25
Sulut	2	1	50	1	50	1	50	1	50	1	50	1	50	0	0	0	0	0	0
Sulse	1	1	100	1	100	1	100	1	100	1	100	1	100	1	100	1	100	0	0
Maluku	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	195	132	68	131	67	131	67	126	65	120	62	114	58	80	41	62	32	39	20

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Table 6
Output Share of Respondents by Province
(As of the end of October 2000)

Province	Percentage Share in Provincial Output								
	January	February	March	April	May	June	July	August	Sept.
Aceh	0	0	0	0	0	0	0	0	0
Sumut	40	40	40	40	40	30	20	20	20
Sumbar	100	100	100	100	100	100	100	100	100
Riau	71	71	71	71	57	57	29	29	0
Jambi	67	67	67	67	67	67	0	0	0
Sumsel	100	100	100	75	75	75	50	50	0
Lampung	100	100	100	100	100	100	100	100	100
DKI	81	78	78	76	72	67	52	43	30
Jabar	68	68	68	68	65	61	44	33	25
Jateng	75	75	75	56	50	50	31	13	6
Yogya	100	100	100	100	100	100	100	100	100
Jatim	70	70	70	70	70	70	37	28	17
Kalbar	0	0	0	0	0	0	0	0	0
Kalsel	100	100	100	100	100	100	100	100	100
Kaltim	75	75	75	75	75	75	75	75	25
Sulut	50	50	50	50	50	50	0	0	0
Sulsel	100	100	100	100	100	100	100	100	0
Maluku	0	0	0	0	0	0	0	0	0
Total	70	70	70	67	64	62	42	34	23

C. Results

Results of computation of a manufacturing production index for the first nine months of the survey are provided in Table 7 and Figure 1. In evaluating the plausibility of these results, the only other independent data source that could be tapped was PLN electricity sales to the industrial sector. The two data series are provided in a comparable index form (with December, 1999 as the numeraire). With the exception of Month 5, both data sources are consistent in the direction of change as well as its order of magnitude.¹¹ While conceptually one does not expect monthly data from both sources to always show the same levels of growth (if, for example, establishments use self-generated electricity or if the definition of “industry” –or establishment classification– used

¹¹ Establishment data were double-checked for the months of April and May to determine whether the high growth rate in the Monthly Survey was a possible error (in reporting, entry or editing). The conclusion was that it was not: the growth rate was based fully on plausible establishment response.

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IV. CONCLUSIONS AND RECOMMENDATIONS

Despite its slow start and its facing less than ideal conditions, the Monthly Manufacturing Survey (which is a sub-system of the broader Quarterly Manufacturing Survey) has so far been an impressive success in several respects:

- a. It shows that **the IMF's SDDS requirement of publishing a preliminary figure within six weeks of the end of the reference month is certainly achievable**. Both targets set by BPS, namely a 20%-25% response rate for the publication of a preliminary figure and a 50% rate for the publication of a final figure, appear to be achievable. Given the pattern of response to that survey so far, namely that the quickest respondents have been some of the biggest establishments, a 50% response rate in the number of establishments translates into about 55% of total output. Although such a level is far lower than what BPS has regarded in the past as the minimum level of adequacy (around 80%), it should still provide reliable figures as long as non-respondents as a group display a behavior which is not consistently different from that of respondents.
- b. It shows that such a **survey produces plausible aggregate results**, the timeliness of which can be very useful for macroeconomic management and for the computation of the National Accounts.
- c. It also shows that it is **feasible to conduct small sample establishment surveys (with brief questionnaires) directly from the BPS Head Office** rather than having to rely on the slow and more rigid bureaucratic structure involving provincial, kabupaten and kecamatan offices. This was made easier in this survey by the large concentration of establishments and their head offices in JABOTABEK. Provincial/ kabupaten/ kecamatan offices can still play a useful supporting role (e.g. in establishing the initial contact with establishments in outer provinces and/or enticing response if the BPS Head Office fails to obtain it) but not the primary data collection role that they have played in the past.
- d. However, experience to date suggests that **success in obtaining response can only be achieved with vigorous and relentless efforts** by the staff responsible for the survey and by the readiness of higher level officials (at the division and/or bureau chief levels) to be intimately involved. In that regard, this survey has replicated the experience of another successful survey (the one producing the Consumer Price Index) which has required the direct regular involvement of the bureau chief himself. The flip side of this point is that any relaxation of the daily pressure to obtain response or the lack of continuous involvement

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by higher level officials will have detrimental consequences on the level of response and therefore on the timeliness and quality of the results.

Our recommendations, therefore, are the following:

a. **Continue the current aggressive policy for obtaining response**, to ensure that the progress achieved to date does not slow down. Obtaining reliable monthly data for the year 2000 is critical, since this year will be used as the numeraire for the monthly indices that BPS plans to publish starting in January, 2001.

b. **Develop a system which can ensure high response**. One possibility to consider is to incorporate the monthly response rate as one indicator in the performance evaluation of the sub-division, division and bureau chiefs. Despite the substantial progress made to date, success remains dependent on self-motivation of the people who have been involved in it so far. Such dependence on personalities leaves room for vulnerability in the long run and needs to be institutionally remedied.

c. **Evaluate regularly the plausibility of the Monthly Survey results and their consistency with other data sources** (e.g. the Annual Manufacturing Survey, PLN electricity sales to Industry, among others). Only through such evaluations could one increase confidence in the data produced by the survey.

d. **Evaluate the possibility of using this survey as a model for future establishment surveys in which timeliness is critical**. Specifically, the features which may provide a good model for future surveys are: the use of a shuttle form, communication by email/fax and data collection directly by the BPS Head Office. Such a strategy would undoubtedly have important budgetary implications which will need to be addressed: e.g. the use of dedicated fax (and/or toll-free) lines, phone lines with long-distance capacity and establishment visits by Head Office staff would have to replace reliance on Mantris.¹²

One should note that such surveys will become increasingly more common in the future, as increased user sophistication and access to powerful computing technology will allow them to place significant emphasis on timeliness and to be more amenable to trade off some accuracy for quicker results. BPS needs to factor this element into its strategy for the next few years if it wants to continue to be the primary source of data for users.

¹²

An even more effective and less labor intensive procedure for data collection would be for establishments to interactively fill questionnaires on the BPS website. However, neither BPS nor establishments in Indonesia are ready for this at the moment.

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e. One survey in which such a model may be successfully applied almost immediately is the current quarterly sub-system. Since the questions used in this survey are exactly the same as those in the monthly sub-system, it may not be too difficult to **turn the current Quarterly Survey into a monthly survey**. That is, surveying on a monthly basis the 797 establishments in the current quarterly sub-system. If this proves successful, then BPS will be able to produce a monthly index for 3-, 2- and 1-digit ISICs within the same time frame as the current monthly sub-system. Users, particularly the National Accounts bureaus at BPS, would wholeheartedly welcome such a survey because it would help them improve their current initial GDP estimation methods. To evaluate the feasibility of such a survey, one can start with a pilot test during the first two or three quarters of 2001.¹³

f. Once the monthly survey becomes a routine operation, BPS can **augment it by incorporating separate indices for mining, electricity and oil and gas in order to produce a monthly index of industrial production**, rather than one for manufacturing only. Different aggregation methodologies can be experimented with and the most promising one can be adopted.

¹³ If the results of the pilot are successful, then BPS will be able to publish a monthly series with 2000 as a numeraire year. Monthly data for 2000 will be available since they are currently being collected as part of the quarterly sub-system.

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APPENDIX A
QUESTIONNAIRE USED IN MONTHLY SURVEY

APPENDIX B

INDEX COMPUTATION FORMULAS

As mentioned in Section II.C, index computation involves three steps:

1) The first includes computation of commodity growth factors, simply as the ratio of the quantity of a particular commodity between the two relevant months.

$$G_{ij2} = \frac{Q_{ij2}}{Q_{ij1}} \dots\dots\dots (B.1)$$

where: G_{ij2} is the growth factor of commodity j for establishment i between Months 1 and 2
 Q_{ij2} is the production of commodity j for establishment i in Month 2 and
 Q_{ij1} is the production of commodity j for establishment i in the base month.

2) The second includes calculating an establishment index, measuring establishment growth by aggregating commodity growth factors using their relative Divisia weights:

$$\frac{I_{i2}}{I_{i1}} = e^{\left(\frac{\sum_j V_{ij}}{\sum_j V_{ij}} \ln(G_{ij2}) \right)} \dots\dots\dots (B.2)$$

where: I_{i2} is the production index in Month 2 for establishment i,
 I_{i1} is the production index in the base month for establishment i and
 V_{ij} is the value of commodity j produced by establishment i during the two-month period.

3) The third step includes aggregating directly to the one-digit ISIC level (using combined sampling and Divisia weights) to measure growth for the whole manufacturing sector by producing a total monthly index:

$$\frac{I_2}{I_1} = e^{\left(\sum_i \frac{W_i V_i}{\sum_i W_i V_i} \ln \left(\frac{I_{i2}}{I_{i1}} \right) \right)} \dots\dots\dots (B.3)$$

where: I_2 is the total production index in Month 2,
 I_1 is the total production index in the base month,
 W_i is the sampling weight of establishment i and
 V_i is the value of output produced by establishment i during the two-month period.

In order to reduce the influence of extreme observations, limits were placed on three types of variables:

1) **Commodity growth:** the $\ln(G_{ij2})$ term in Equation (B.2) was limited to the following range: 2.5 and -2.5. In other words, the maximum monthly growth of any one commodity would be 12 times (antilog of 2.5) and the monthly decline would be 92% (antilog of -2.5).

2) **Establishment growth:** the ratio I_{i2}/I_{i1} in Equation (B.2) was limited to the following range: 1.75 and 0.25. In other words, the maximum monthly establishment growth would be 75% and the maximum decline 75%.

3) **Establishment weight:** establishments selected with certainty were treated differently than those selected with probability less than one.

a. Establishments selected with certainty:

- Let M_i be the measure of size (1996 output) for establishment i ,
- M_i the sum of measure of size for all establishments selected with certainty in the frame,
- $'M_i$ the sum of the measure of size for all respondents selected with certainty,
- U_i the value of output reported by establishment i ,
- V_i the weighted value of output for establishment i , equal to $U_i (M_i / 'M_i)$,
- M'_i the adjusted measure for size for establishment i , equal to $M_i (M_i / 'M_i)$.

The weighted value of output V_i are limited to this range:

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$$\frac{1}{10} \frac{\sum V_i}{\sum M_i} M_i \leq V_i \leq 2 \frac{\sum V_i}{\sum M_i} M_i \dots\dots\dots (B.4)$$

b. Establishments selected with probability less than one:

- Let N be the number of establishments selected with probability less than one in the frame,
- N' be the number of respondents selected with probability less than one,
- U_i the value of output reported by establishment i,
- W_i the sampling weight of establishment i,
- V_i the weighted value of output for establishment i, equal to U_iW_i N/N'.

The weighted value of output V_i are limited to this range:

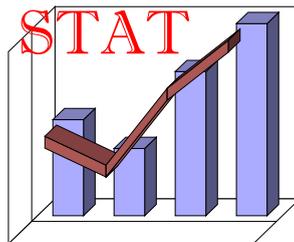
$$\frac{1}{10} \frac{\sum V_i}{N'} \leq V_i \leq 2 \frac{\sum V_i}{N'} \dots\dots\dots (B.5)$$

**QUARTERLY NATIONAL ACCOUNTS
IN INDONESIA :
CURRENT SOURCES AND METHODS
(DRAFT)**

Report # 24
Statistical Paper # 3

by
Yahya Jammal

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I. INTRODUCTION

This report is an attempt to document the current methodologies used by BPS in compiling the country's quarterly national accounts. Many BPS staff members contributed substantially to the attempt. One should note that methodologies in national accounting evolve over time: as new data sources become available or old ones are eliminated, the computation methodology for a particular variable may change. What is documented here is the set of core methodologies which form the basis for the most current estimations. These methodologies have involved evaluating dozens of data sources, deciding which ones are most appropriate to use and forcing consistency when sources appear inconsistent. Adjustments in methodologies to take account of special statistical problems in a particular quarter –reporting problems or unusual compositional changes, for example– are not described here.

The report is aimed at educating users within as well as outside BPS. Within BPS, the overall description in the report should help the staff understand what is done outside the limited area in which each person works. Such broader understanding should promote interchange of ideas and better appreciation of the strengths, weaknesses and areas needing attention in Indonesia's national accounts.

For users outside BPS, more knowledge of how data are calculated should enable useful feedback which will in turn help improve the accuracy and usefulness of the data. In addition, the report should help users outside BPS recognize that national accounts estimation is beset by substantial sources of uncertainty. The large number of data sources tapped vary greatly in quality, coverage and frequency; and alternative data sources are sometimes contradictory. It is not practical to expect compilers of national accounts to wait until primary data sources on every sector of economic activity are available. Given limited resources and binding time constraints, compromises and judgments on the part of the compilers are inevitable. In short, users need to recognize that national accounts compilation inevitably involves some margin of error.

II. COMPILATION OF PRODUCTION ACCOUNT

The nine-sector final published GDP tabulations are the result of estimations of fifty-eight sub-sectors which, in turn, are the outcome of estimations of about two hundred commodities and commodity groups. The majority involve the use of primary data collected quarterly or monthly by BPS, and some collected by the departments of Agriculture, Forestry, Finance, Mining & Energy, Transportation, as well as Bank Indonesia and PLN. Some involve estimations based on less frequently collected primary data and some are based on administrative data. Every figure used at the sub-sectoral level (and by extension, at the sectoral level) is subjected to a plausibility check by evaluating:

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- its implicit cumulative growth rate for the year,
- its growth rate relative to the previous quarter,
- its growth rate relative to the same quarter of the previous year,
- its seasonally adjusted value (this applies only at the sectoral level and for total GDP).¹

Plausibility checks are conducted for estimates at both constant and current prices. They are done in addition to various consistency checks, both of the internal structure of these accounts and with other reliable data sources.

The general approach guiding compilation of these accounts is to rely on the most complete data available at the time of release. When only partial data are available, compilers use any such information and supplement it with estimations. When no data are available, they rely on pure estimations. When estimations are necessary, the general guiding approach is to rely on simple methods as much as possible (e.g. averages, ratios, growth rates etc.); if results are implausible then more sophisticated econometric techniques (e.g. moving averages, regressions, ARIMA etc.) may be used.

Tables 1 and 2 summarize the basic methodologies used for compiling GDP by sector and sub-sector for constant and then for current price estimates. The section that follows describes these sectoral methodologies in more detail. The paper then turns to GDP by expenditure, again presenting summary tables and following with a more detailed description.

¹ This set of checks (which are applied to constant price estimates) started in 2000 with the quarter II data. The program used for seasonal adjustment is the US Census Bureau's X12 ARIMA. The version used currently is Release 0.2.7.

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Table 1
Summary of Sources & Methods of Production Account at Constant Prices

Sector	Sub-Sector	Data Sources	Basic Methodology
Agriculture, Livestock, Forestry & Fishery	1. Farm Food Crops	BPS Agriculture Bureau	Quantities for 9 commodities obtained by multiplying average yield by area harvested. 1993 prices applied
	2. Non-Food Crops	DG Estate Crops, Dept. of Agr. & BPS monthly producer survey	Monthly quantities for 11 primary commodities obtained from survey, and trend applied to remaining 13 commodities. 1993 prices applied
	3. Livestock	GD Livestock, Dept. of Agr.	Quantities obtained for 9 commodities. 1993 prices applied
	4. Forestry	Dept. of Forestry	Quantities obtained for 7 commodities. 1993 prices applied
	5. Fishery	DG Fishery, Dept. of Agr.	Quantities obtained for 3 commodities. 1993 prices applied
Mining & Quarrying	1. Crude Petroleum & Natural Gas	Dept. of Mining	Quantities for 3 commodities obtained. 1993 prices applied
	2. Non-oil Gas & Mining	Dept. of Mining	Quantities for 21 commodities obtained. 1993 prices applied
	3. Quarrying	BPS Industry Bureau	Quarterly construction index is applied
Manufacturing	1. Petroleum Refining	DG Oil & Gas, Dept. Mining	Monthly quantities for 35 commodities obtained. 1993 prices applied
	2. LNG	DG Oil & Gas, Dept. Mining	Monthly quantities obtained. 1993 prices applied.
	3. Nine 2-digit ISIC	BPS Industry Bureau	Medium & Large establishments: quarterly manufacturing index applied by 3-digit ISIC Small & Cottage: average compound growth rate of employment in the 1998-99 SUSI surveys is applied by 3-digit ISIC
Electricity, Gas & Water	1. Electricity	PLN	Monthly production of PLN + non-PLN multiplied by 1993 price. VA to output ratio applied.
	2. City Gas	PGN	Monthly quantities are multiplied by 1993 prices. VA to output ratio applied.
	3. Water Supply	BPS survey of Water Supply Establishments	Annual quantities are multiplied by 1993 prices. Historical quarterly trend used. VA to output ratio applied.
Construction		Industry Bureau, DG forestry, DG Mining	Quantity indices of wood, bamboo, asphalt, cement and manufacturing building materials are obtained from various sources and applied to previous quarter
Trade, Hotels & Restaurants	1. Wholesale/Retail Trade	BPS I/O Surveys	Ratio of VA margin to supply is applied to supply of other sub-sectors
	2. Hotels	Dep. Tourism	VA regressed against number of foreign visitors
	3. Restaurants	Current price series, CPI	Price change in "prepared food" component of CPI is applied to current price series

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Transport & Communications	1. Transport	Dep. Transport., relevant public enterprises	Annual quantities for 18 commodities. Quarterly trend of a sample of commodities or of historical series applied.
	2. Communications	PT Indosat, PT Pos, PT Telkom	Quantities for 13 commodities sold obtained. Quarterly trend of PT Telkom applied to others
Financial, Ownership & Business Services	1. Banks	Current price series, CPI	Price change in total CPI is applied to current price series
	2. Non-bank Financial Institutions	Current price series, WPI	Price change in total WPI is applied to current price series
	3. Services Related to Finance	Current price series, WPI	Same as above
	4. Building Rentals	Current price series, CPI	Price change in total CPI is applied to current price series
	5. Business Services	Current price series, CPI	Same as above
Services	1. General Government	Current price series, Dep. Finance	Current price series deflated by an employee compensation index for civil servants
	2. Social & Community	Dep. Education, Dep. Health	Education: quarterly expenditure per student in 1993 prices multiplied by number of students Health: quarterly expenditure per patient in 1993 prices multiplied by number of patients
	3. Amusement/Recreation	Dep. Tourism, Association of TV/radios, IO table	quarterly expenditure per unit for 3 activities in 1993 prices multiplied by number of units
	4. Personal & Household	Dep. Transport., Susenas, IO table	Vehicle repair: quarterly expenditure per vehicle in 1993 prices multiplied by number of vehicles Other repair: quarterly expenditure per worker in 1993 prices multiplied by number of workers Servants: quarterly expenditure per household in 1993 prices multiplied by number of households

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Table 2
Summary of Sources & Methods of Production Account at Current Prices

Sector	Sub-Sector	Data Sources	Basic Methodology
Agriculture, Livestock, Forestry & Fishery	1. Farm Food Crops	Constant price series, WPI	Price changes in relevant component of WPI are applied to constant price series
	2. Non-Food Crops	Constant price series, WPI	Same as above
	3. Livestock	Constant price series, WPI	Same as above
	4. Forestry	Constant price series, WPI	Same as above
	5. Fishery	Constant price series, WPI	Same as above
Mining & Quarrying	1. Crude Petroleum & Natural Gas	Constant price series	Export unit value changes (in rupiah) are applied to constant price series
	2. Non-oil Gas & Mining	Constant price series, BPS Services Bureau	Current export prices (converted to rupiah) are applied to constant price series
	3. Quarrying	Constant price series, WPI	Price changes in "quarrying" component of WPI are applied to constant price series
Manufacturing	1. Petroleum Refining	DG Oil & Gas, Dept. Mining	Monthly quantities for 35 commodities obtained. Current prices applied
	2. LNG	DG Oil & Gas, Dept. Mining	Monthly quantities obtained. Current export prices converted to rupiah applied
	3. Nine 2-digit ISIC	Constant price series, WPI	Price changes in relevant component of WPI are applied to constant price series
Electricity, Gas & Water	1. Electricity	Constant price series, CPI	Price changes in relevant component of CPI are applied to constant price series
	2. City Gas	Constant price series, CPI	Same as above
	3. Water Supply	Constant price series, CPI	Same as above
Construction		Constant price series, WPI	Price changes in relevant component of WPI are applied to constant price series
Trade, Hotels & Restaurants	1. Wholesale/Retail Trade	BPS I/O Surveys	Ratio of VA margin to supply is applied to supply of other sub-sectors
	2. Hotels	Constant price series, CPI	Price changes in relevant component of CPI are applied to constant price series
	3. Restaurants	Susenas	Expenditure per household x number of households, divide equally by quarter
Transport & Communications	1. Transport	Constant price series, CPI	Price changes in relevant component of CPI are applied to constant price series
	2. Communications	PT Indosat, PT Pos, PT Telkom	Value of sales for 13 commodities obtained. Quarterly trend of PT Telkom applied to others
Financial, Ownership & Business Services	1. Banks	Bank Indonesia	Value added estimates obtained directly from Bank Indonesia

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Services	2. Non-bank Financial Institutions	Dep. Finance, BPS special survey	Operating revenue obtained for 5 activities, converted to quarterly using historical trend. VA/output ratio applied
	3. Services Related to Finance	Jakarta/Surabaya Stock Exchanges, Bank Indonesia	Operating revenue obtained for 3 activities, converted to quarterly using historical trend. VA/output ratio applied
	4. Building Rentals	Susenas, Population estimates, real estate association	Dwelling: per capita consumption on rentals multiplied by population Non-Dwelling: monthly output for major cities.
	5. Business Services	INKINDO, BPS special survey	VA per consultant for 5 activities multiplied by number of consultants
	1. General Government	Dep. Finance, BPS special survey	Quarterly personnel expenditure + 5% estimated consumption of fixed capital
	2. Social & Community	Dep. Education, Dep. Health	Education: quarterly expenditure per student multiplied by number of students Health: quarterly expenditure per patient multiplied by number of patients
	3. Amusement/Recreation	Dep. Tourism, Association of TV/radios, IO table	quarterly expenditure per unit for 3 activities multiplied by number of units
	4. Personal & Household	Dep. Transport., Susenas, IO table	Vehicle repair: quarterly expenditure per vehicle multiplied by number of vehicles Other repair: quarterly expenditure per worker multiplied by number of workers Servants: quarterly expenditure per household multiplied by number of households

A. Agriculture, Livestock, Forestry & Fishery

This includes five sub-sectors:²

1. Farm Food Crops

Constant Prices

Quantities for eleven commodities are computed, one ("sagu") based on data from BPS's Industry Bureau and the other ten based on data from BPS's Agriculture Bureau:

² Generally, initial quantity estimates are based on available quarterly or monthly commodity data. For commodities where data are not yet available, a quarterly growth equal to that of the same quarter in the previous year is projected and sometimes modified based on current relevant information obtained from mass media.

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- paddy (“padi”)
- corn (“jagung”)
- cassava (“ketela pohon”)
- yam (“ketela rambat”)
- green beans (“kacang hijau”)
- peanuts (“kacang tanah”)
- soy beans (“kacang kedelai”)
- vegetables (“sayuran”)
- fruits (“buah-buahan”)
- potatoes (“kentang”)

Data collection of the first seven commodities provided by the Agriculture Bureau is done monthly for area harvested and in three sub-rounds (each covering a four-month period) every year for the average yield. Monthly production is calculated as the product of area harvested and the average yield of the relevant four-month period, and is then aggregated by quarter. Quantities for the last three categories of products (i.e. vegetables, fruits and potatoes) are obtained from the monthly/quarterly survey conducted by BPS jointly with the Directorate General of Horticulture of the Department of Agriculture. This survey, which aims at measuring production of these commodities, is conducted monthly for seasonal fruits and vegetables and quarterly for non-seasonal fruits and vegetables, and covers all regencies/municipalities in Indonesia.

Quantities are then multiplied by their relevant 1993 prices. Since these production figures are those used for computing subsequent annual figures for the relevant commodities, they are generally not revised. The only time a revision takes place is when a more complete production survey for the year, e.g. based on the household approach rather than on the crop-cutting approach, is conducted. But that does not take place on a regular basis.

For “sagu”, only annual data are available after a relatively long lag. Quarterly growth in production is assumed to be the same as the average quarterly production growth of “sagu”-consuming sectors.³ Growth is then applied to the previous quarter’s output to arrive at the current quarter’s estimate of production.

Figures are then summed-up and a value-added to output ratio (derived from the 1995 IO table) is then applied to produce a value added level at constant 1993 prices. A further 3.5% markup (derived from the 1995 IO table) of the aggregate level is added to take into consideration the contribution of other commodities in this category.

Current Prices

For all commodities except potatoes, vegetables, fruits and “sagu”, the initial estimate of

³ These include the following 5-digit ISICs: 31112, 31134, 31171, 31212, 31219, 31241, 31249, 31251.

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the value of production relies on the use of the Wholesale Price Index (WPI)⁴. Once monthly rupiah data are available, about six months after the end of the reference year, the actual rupiah prices for individual commodities are used.

Let Q_i^I represent the quantity of commodity i produced in quarter I
 Q_i^{II} the quantity of commodity i produced in quarter II
 P_i^I the average price of commodity i in quarter I
 P_i^{II} the average price of commodity i in quarter II

The methodology for computing the initial estimate of the value of production of commodity i in quarter II can be described as:

$$Q_i^{II} P_i^{II} = (Q_i^{II} / Q_i^I) (P_i^{II} / P_i^I) (Q_i^I P_i^I) \quad (1)$$

The first term on the right hand side of the equation represents the change in real production in quarter II, the second term the change in the price index and the third term the value of production of quarter I. Once rupiah prices are available, P_i^{II} is simply multiplied by Q_i^{II} .

For potatoes, vegetables, fruits and “sagu”, the Consumer Price Index (CPI)⁵ is applied to quantity estimate for the quarter and the current value is calculated as in Equation (1). No revision to prices is done in this case since the only available data refer to index numbers.

Here again, a value-added to output ratio (derived from the 1995 IO table) is applied to convert the “value of output” estimate into a value-added estimate and a 5% markup (from the 1995 IO table) is applied.

2. Non-Food Crops

Constant Prices

Annual quantities are obtained for 22 commodities (from the Directorate General of Estate Crops of the Department of Agriculture), which are grouped into two main categories:⁶

- a. Major commodities: these make up 77% of the value of all commodities in this sub-sector in 1993. They include:
 - cocoa (“cokelat”)

⁴ Specifically, it uses the average index for the relevant commodity under “food crops” calculated for 14 provinces.

⁵ Specifically, the “vegetables” and “fruits” components of the composite CPI for 43 cities is applied to the relevant category.

⁶ Before such annual data are available, the quarterly growth rate for various commodities is estimated as the average growth rate for the relevant quarter (and commodity) over the previous four years.

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- cloves (“cengkeh”)
- rubber (“karet”)
- cane sugar (“tebu”)
- coconut (“kelapa”)
- palm oil (“kelapa sawit”)
- coffee (“kopi”)
- tobacco (“tembakau”)
- tea (“teh”)

b. Minor commodities: these make up 23% of the value of all commodities in this sub-sector in 1993. They include:

- vanilla (“panili”)
- cotton (“kapas”)
- pepper (“lada”)
- nutmeg (“pala”)
- cinnamon (“kayu manis”)
- rosella (“rami”)
- jute (“serat karung”)
- ginger (“jahe”)
- cashew (“jambu mete”)
- “jarak”
- capok (“kapok”)
- quinine (“kemiri”)
- “kina”

A monthly survey of a sample of producers of major commodities is conducted for the purpose of estimating monthly production and its value. That monthly ratio of annual production is applied to the total annual production obtained from the Department of Agriculture to calculate quarterly production estimates.

For the thirteen minor commodities, the quarterly real quantity trend of the nine primary commodities is applied to the annual production figure obtained from the Department of Agriculture. Quantity data for commodities are multiplied by their corresponding prices in 1993. A value-added to output ratio (derived from the 1995 IO table) is then applied to produce a value added level at constant 1993 prices. These levels are then added up, a 4% markup of the aggregate level is added to take into consideration the contribution of the by-products (“produk ikutan”) of the above commodities, and a further 5% for the contribution of other commodities in this category (both derived from the 1995 IO table)

Current Prices

The same valuation methodology used in food crops applies here. That is, an initial estimate of the value of production uses the “estates” component of WPI, as in Equation (1)

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above. Once monthly rupiah data are available, about six months after the end of the reference year, the actual rupiah prices for individual commodities are used.⁷

Here again, a value-added to output ratio is applied to convert the “value of output” estimate into a value-added estimate and the same 4% and 5% markups are applied as in the case of constant price figures.

3. Livestock

Constant Prices

Quarterly quantities are obtained for nine commodities from the Directorate General of Livestock of the Department of Agriculture Bureau:⁸

- cows
- buffalos
- goats
- pigs
- horses
- chickens
- ducks
- eggs
- milk

Numbers are changed subsequently only if different annual data become available.

Quantity data for commodities are multiplied by their corresponding prices in 1993. A value-added to output ratio (derived from the 1995 IO table) is then applied to produce a value added level at constant 1993 prices. These levels are then added up, a 0.5% markup of the aggregate level is added to take into consideration the contribution of the by-products (“produkt ikutan”) of the above commodities, and a further 1.8% for the contribution of other commodities in this category (both derived from the 1995 IO table).

Current Prices

The same valuation methodology used in food crops applies here. That is, an initial

⁷ Ten secondary commodities are not included in the WPI and therefore require the use of proxies. Commodities and corresponding proxies (in parentheses) are: cocoa; ginger, “jarak”, “kemiri” and “kina” (“kayu manis” and “rempah-rempah”); “jambu mete”, “panili”, “rami” and “serat karung” (“tanaman perdagangan”).

⁸ Quantity produced for a particular type of animal, measured by the number of heads, is defined as the sum of: quarterly increase in population + number of heads slaughtered + (exports - imports). For slaughtered animals, the following conversion factors (from kg of meat to heads) are used: cows (156.4 kg/head), buffalo (160 kg/head), goats (10 kg/head), pigs (50 kg/head), horses (125 kg/head), chicken (0.75 kg/head) and ducks (0.75 kg/head).

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estimate of the value of production uses the “Livestock” component of WPI, as in Equation (1) above. Once monthly rupiah data are available, about six months after the end of the reference year, the actual rupiah prices for individual commodities are used.

Here again, a value-added to output ratio is applied to convert the “value of output” estimate into a value-added estimate and the same 0.5% and 1.8% markups are applied as in the case of constant price figures.

4. Forestry

Constant Prices

Monthly quantities are obtained for seven commodities from the Department of Forestry:

- teak (“kayu jati”)
- “kayu rimba”
- “kayu rakyat”
- firewood (“kayu bakar”)
- charcoal (“arang”)
- bamboo (“bambu”)
- rattan (“rotan”)

Production data for the first two commodities are used as reported. However, monthly data for the other five commodities show implausible discontinuities. For these commodities, annual data obtained from the same source are used, monthly trends from the previous year are applied and used to calculate quarterly figures.

Quantity data for commodities are multiplied by their corresponding prices in 1993. A value-added to output ratio (derived from the 1995 IO table) is then applied to produce a value added level at constant 1993 prices. These levels are then added up and a markup of 1.6% (derived from the 1995 IO table) is applied.

Current Prices

The same valuation methodology used in food crops applies here. That is, an initial estimate of the value of production uses the “forestry” component of WPI, as in Equation (1) above. Once monthly rupiah data are available, about six months after the end of the reference year, the actual rupiah prices for individual commodities are used.

Here again, a value-added to output ratio is applied to convert the “value of output” estimate into a value-added estimate and a 1.6% markup is applied.

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5. Fishery

Constant Prices

Annual quantities are obtained for three commodities from the Directorate General of Fishery of the Department of Agriculture):

- fresh water fish (“ikan darat”)
- salt water fish (“ikan laut”)
- shrimp (“udang”)

Quarterly estimates before the annual data are available are computed by applying the average growth rate of the reference quarter over the past four years.

Quantity data for commodities are multiplied by their corresponding prices in 1993. A value-added to output ratio (derived from the 1995 IO table) is then applied to produce a value added level at constant 1993 prices. These levels are then added up, and a further 2.5% markup of the aggregate level is added to take into consideration the contribution of other commodities in this category (derived from the 1995 IO table).

Current Prices

The same valuation methodology used in food crops applies here. That is, an initial estimate of the value of production uses the “fishery” component of WPI, as in Equation (1) above. Once monthly rupiah data are available, about six months after the end of the reference year, the actual rupiah prices for individual commodities are used. A value-added to output ratio is applied to produce a value added level at current prices. These levels are then added up, and a further 2.5% markup is applied.

B. Mining & Quarrying

This includes three sub-sectors:

1. Crude Petroleum & Natural Gas

Constant Prices

Monthly quantity growth rates are obtained for four commodities from EKUIN reports (which are based on data provided by the Directorate General of Oil & Gas of the Department of Mining and Energy):

- crude oil (in barrels)
- condensate (in barrels)
- natural gas (LNG, in MSCF)
- geothermal steam (in tons)

These rates are applied to the previous quarter's levels to arrive at the current quarter's preliminary estimates. A revision is made when official monthly quantities are obtained from the Directorate General of Oil & Gas. These are then multiplied by their relevant 1993 prices.

When annual quantity data for the four commodities are produced by the Department of Mining & Energy, which is normally done with a lag of about six months, they are multiplied by their relevant 1993 prices to arrive at a constant price estimate of production. This estimate is then multiplied by the relevant value-added to output ratio computed for 1993, which was based on that year's BPS survey of Petroleum and Natural Gas Mining Companies.⁹ Any difference in annual figures between the initial estimates (based on monthly official quantities) and final figures (based on annual quantities) is then attributed to the December figures.

Current Prices

Monthly quantities for every commodity are multiplied by a rupiah price computed as a weighted average of the domestic price and the export unit value (converted at the average monthly exchange rate), with weights obtained from the latest annual survey of petroleum and natural gas mining companies. A value-added to output ratio (from that survey) is then applied to arrive at total value added at current prices.

2. Non-Oil & Gas Mining

Constant Prices

Monthly total quantities are obtained for nine major (and seven minor) commodities from EKUIN reports (which contain the latest data from the Department of Mining):

- coal ("batubara")
- copper ("tembaga")
- bauxite
- tin ("timah")
- "ferro nickel"
- "bijih nickel"
- "nickel mattes"
- gold ("bijih emas")
- silver ("bijih perak")
- asphalt ("aspal alam")
- manganese ("bijih mangan")
- sulfur ("belerang")
- iodine ("yodium")

⁹ This is an annual survey conducted by the division of Mining, Energy and Construction covering input and output structure of establishments in this sector.

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- phosphate
- iron sand (“pasir besi”)
- other minor commodities

Monthly exports of each commodity are then compared with total production, and the difference is defined as production for domestic consumption. Relevant 1993 prices (distinguishing between exported and domestic consumption) are applied to calculate production at constant prices. Finally, a value-added to output ratio is applied, obtained from the BPS annual survey of Non-Petroleum and Natural Gas Mining.¹⁰ Revisions to monthly figures are only made when official figures obtained from EKUIN reports are changed.

Current Prices

Since the largest share of these commodities is exported, the principal source of valuation is export unit values. Monthly exported quantities of the above commodities are valued using the relevant unit price converted into rupiah at the average monthly exchange rate. For domestic commodities, a ratio of domestic/export price for the particular commodity is used based on historical behavior.

3. Quarrying

Constant Prices

Quarterly changes are estimated by applying the quarterly index of construction to the previous quarter's levels. These figures are revised when the quarterly construction index is, but no annual revision takes place since no other more complete data exist.

Current Prices

Constant price value-added estimates are inflated by using the “quarrying” component of the Wholesale Price Index.

C. Manufacturing

This includes eleven sub-sectors:

1. Petroleum Refining

Constant Prices

Three sets of data are obtained from the Directorate General of Oil and Gas of the Department of Mining and Energy: monthly, quarterly and annual. Data refer to quantity of

¹⁰ This is a survey conducted by the division of Mining, Energy and Construction covering input and output structure of establishments in these sectors.

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refined products during the relevant period. Refined products include:

- 11 types of fuels
- 22 types of non-fuels
- 4 types of refining fuels.

Preliminary estimates rely on monthly figures. Revisions, when necessary, are made subsequently based on quarterly and annual reports. Quarterly quantities (in barrels) are multiplied by their corresponding 1993 prices, then summed up. A value-added to output ratio (from the annual Survey of Petroleum Mining and Natural Gas conducted by BPS) is then applied.

Current Prices

Quarterly quantities (in barrels) are multiplied by their corresponding domestic prices,¹¹ then summed up. A value-added to output ratio (from the annual Survey of Petroleum Mining and Natural Gas conducted by BPS) is then applied.

2. Liquefied Natural Gas

Constant Prices

Three sets of data are obtained from the Directorate General of Oil and Gas of the Department of Mining and Energy: monthly, quarterly and annual. Data refer to quantity of LNG produced by the two refineries in Arun and Badak. Preliminary estimates rely on monthly figures. Revisions, when necessary, are made subsequently based on quarterly and annual reports. Quarterly quantities (in cubic meters) are multiplied by their corresponding 1993 prices, then summed up. A value-added to output ratio (from the annual Survey of Petroleum Mining and Natural Gas conducted by BPS) is then applied.

Current Prices

As LNG is primarily destined for exports, quarterly quantities (in cubic meters) are multiplied by a corresponding average quarterly unit value converted to rupiah at the average quarterly exchange rate, then summed up. A value-added to output ratio (from the annual Survey of Petroleum Mining and Natural Gas conducted by BPS) is then applied.

3. Food, Beverages & Tobacco

Constant Prices

For every 3-digit ISIC component two quarterly indices are computed:

¹¹ Prices for various refined products are set by the government and are produced in the quarterly reports of the Directorate General of Oil and Gas..

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- first is the contribution of Medium & Large establishments. Data are obtained from the Industry Bureau's Quarterly Manufacturing Survey.¹²
- the second is the contribution of small and cottage industries. Since no quarterly primary data sources are available, a constant growth rate is estimated as the average quarterly compound growth rate of employment in the SUSI surveys of 1998 and 1999.¹³

Let Q_i^I and Q_i^{II} represent the quantities of 3-digit ISIC sub-sector i produced in quarters I and II respectively
 Π_i^I and Π_i^{II} the quantities of intermediate inputs used by sub-sector i in quarters I and II respectively
 PO_i^{93} the price of output produced by sub-sector i in 1993, the numeraire year
 PI_i^{93} the price of intermediate inputs used by sub-sector i in 1993

The estimate of the value added of sub-sector i in quarter II is identically equal to:

$$(Q_i^{II} PO_i^{93} - \Pi_i^{II} PI_i^{93}) = (Q_i^I PO_i^{93} - \Pi_i^I PI_i^{93}) [(Q_i^{II} PO_i^{93} - \Pi_i^{II} PI_i^{93}) / (Q_i^I PO_i^{93} - \Pi_i^I PI_i^{93})] \quad (2)$$

The first term on the right hand side of the equation is the value added in quarter I, and the second term represents the change in value added between quarters I and II. Assuming that the value added to output ratio is constant in the short term, then Equation (2) becomes:

$$(Q_i^{II} PO_i^{93} - \Pi_i^{II} PI_i^{93}) = (Q_i^I PO_i^{93} - \Pi_i^I PI_i^{93}) (Q_i^{II} PO_i^{93} / (Q_i^I PO_i^{93})) \quad (3)$$

which can be simplified as:

$$(Q_i^{II} PO_i^{93} - \Pi_i^{II} PI_i^{93}) = (Q_i^I PO_i^{93} - \Pi_i^I PI_i^{93}) (Q_i^{II} / Q_i^I) \quad (4)$$

The second term of this equation is nothing but the growth in the quarterly production index for ISIC i in quarter II for medium and large establishments obtained from the Industry Bureau. For small and cottage industries, the same relationship in Equation (4) is used, except that the ratio

¹² If relevant indices from that survey are not available, the average growth rate for the reference quarter between 1993 and the latest available year is used.

¹³ SUSI (Survei Usaha Terintegrasi) is an area-based annual survey of non-agricultural small and cottage industries started in 1998.

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$Q_i^{\text{II}} / Q_i^{\text{I}}$ is constant from quarter to quarter.

Value added measures for 3-digit ISIC's are then added up to obtain the total value added at constant prices for the "Food, Beverages & Tobacco" sub-sector.¹⁴

Current Prices

Current price value-added figures are computed at the 3-digit ISIC in three stages:

- First, commodity output in constant prices ($Q_i^{\text{II}} PO_i^{93}$) is multiplied by the relevant monthly commodity (output) price indices¹⁵ in the WPI to produce commodity output in current prices ($Q_i^{\text{II}} PO_i^{\text{II}}$),
- these figures are added up to produce a 3-digit ISIC output in current prices,
- this is then multiplied by the annual value added to output ratio derived from the latest annual survey of medium and large manufacturing establishments.¹⁶

4. Textiles, Leather Products & Footwear

The same methodology used in "Food, Beverages & Tobacco" is applied to this sub-sector.

5. Wood Products

The same methodology used in "Food, Beverages & Tobacco" is applied to this sub-sector.

6. Paper & Printing

The same methodology used in "Food, Beverages & Tobacco" is applied to this sub-sector.

¹⁴ Output in constant prices ($Q_i^{\text{II}} PO_i^{93}$) is also computed (it is the product of the value-added ratio between the two quarters and the constant price output of the previous quarter), and is used primarily as a component of total supply for the compilation of the constant price value added of the Wholesale & Retail Trade sub-sector (see Section II.F.1).

¹⁵ Appendix A provides the correspondence between various WPI commodities and 3-digit ISIC.

¹⁶ A plan is underway for using the 3-digit implicit unit value indices produced by the Industry Bureau on a quarterly basis. These indices are more appropriate deflators of the quarterly production indices than the currently used components of the WPI for two main reasons: a) they cover far more commodities than the WPI; b) they rely on exactly the same data reported by establishments and used in computing the corresponding production index.

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7. Fertilizers, Chemicals & Rubber Products

The same methodology used in “Food, Beverages & Tobacco” is applied to this sub-sector.

8. Cement & Non-Metallic Mineral Products

The same methodology used in “Food, Beverages & Tobacco” is applied to this sub-sector.

9. Basic Iron & Steel

The same methodology used in “Food, Beverages & Tobacco” is applied to this sub-sector.

10. Transportation Equipment & Machinery

The same methodology used in “Food, Beverages & Tobacco” is applied to this sub-sector.

11. Other Manufacturing Products

The same methodology used in “Food, Beverages & Tobacco” is applied to this sub-sector.

D. Electricity, Gas & Water

This includes three sub-sectors:

1. Electricity

Constant Prices

Monthly quantity of electricity produced (by both PLN and other producers) are obtained from PLN. These are then multiplied by their corresponding price in 1993. A 1993 value-added to output ratio (derived from that year’s BPS survey of PLN¹⁷) is then applied to produce a value added level at constant 1993 prices. These levels are then added up, and a further 4% markup of the aggregate level is added to estimate the value added of self-generation by households (derived from the 1990 IO table).

Current Prices

Growth in the “Fuel, electricity, water” component of the Consumer Price Index is applied to the previous quarter’s rupiah prices and multiplied by the quantities above. A value-added to

¹⁷ The survey is conducted annually by the division of Mining, Energy and Construction covering input and output structure of all 22 units of PLN.

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output ratio derived from the current year's survey of PLN is then applied as well as the same 4% markup used in estimating constant price figures.

2. City Gas

Constant Prices

Monthly quantity data are obtained from the monthly EKUIN report (which contain the latest available data from the state gas company Perusahaan Gas Negara, PGN) and multiplied by their corresponding 1993 price. This estimate is then multiplied by the 1993 value-added to output ratio obtained from the BPS annual survey of PGN.

Current Prices

Growth in the "Fuel, electricity, water" component of the CPI is applied to the previous quarter's rupiah prices and multiplied by the quantities above. A value-added to output ratio obtained from the current year's survey of PGN is then applied.

3. Water Supply

Constant Prices

For lack of primary data sources on production of drinking water, initial quarterly growth rates for a particular year are assumed to be the same as those of the previous year. Once results of the annual BPS survey of Water Supply Establishments¹⁸ are available, estimates are revised: quantities of water produced is multiplied by their corresponding 1993 price and the same quarterly trend is kept. This estimate is then multiplied by a value-added to output ratio obtained from the 1993 survey.

Current Prices

Quarterly current price estimates are computed as the product of the constant price quarterly estimate and the level of the "Fuel, electricity, water" component of the CPI.

E. Construction

Constant Prices

Quarterly quantities are calculated using the following four-step procedure:

- 1) First, quarterly quantity indices are calculated for five categories of commodities:
 - "kayu pertukangan" (obtained from the Directorate General of Forestry)

¹⁸ The survey is conducted by the division of Mining, Energy and Construction covering input and output structure of about 500 establishments.

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- bamboo (obtained from the Directorate General of Forestry)
 - asphalt (obtained from the Directorate General of Mining)
 - cement input (obtained from various bureaus of BPS and computed as production (of ISIC 36310) + imports - exports¹⁹)
 - production of building materials (obtained from the Quarterly Manufacturing Survey) defined as ISICs: 33111, 33113, 35210, 36112, 362, 36310, 36320, 364, 371, 38131, 38139. Indices are aggregated using ISIC shares in industry output in 1990 Input-Output Table.
 - imported building materials: dollar values are converted into rupiah and deflated using the “general” index of imported commodities of the WPI.
- 2) Changes in the indices are multiplied by the previous quarter’s constant price series then summed up to obtain an estimate for intermediate inputs for the construction sector from the above sub-sectors.
 - 3) A 3.9% markup is added to allow for other intermediate inputs not accounted for above (that was obtained from the 1990 Input-Output Table). The total then represents total intermediate inputs used by the construction sector.
 - 4) Finally, a ratio of intermediate inputs to output (obtained from the 1990 IO table) is used to estimate quarterly output at constant prices. Value added is then computed as the difference between estimates of output and intermediate inputs.

Current Prices

The constant price components above are inflated using various relevant components of the WPI:

- the “kayu gelondongan” component for “kayu pertukangan”,
- the “bamboo” component for bamboo,

¹⁹ Calculations for cement are a bit more complicated given the multiplicity of sources. First, the production index is multiplied by the previous quarter’s level. Then imported and exported dollar values are converted to rupiah and divided by the “other non-metallic mineral products” component of the WPI.

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- the “asphalt” component for asphalt, and
- the “general index” of manufacturing commodities is used for cement and other domestic building materials.

As with the constant price series, these values are summed up then inflated by 3.9% to estimate total intermediate inputs of the construction sector. A ratio of intermediate inputs to output (obtained from the current year’s BPS survey of construction establishments) is used to estimate quarterly output. Value added is then computed as the difference between estimates of output and intermediate inputs.

F. Trade, Hotels & Restaurants

This includes three sub-sectors.

1. Wholesale & Retail Trade

During Input-Output years (and occasionally in between), BPS conducts a special survey for the Trade & Services sector involving about 1000 producers and 750 traders, and referred to as SKSPJ (“Survei Khusus Sektor Perdagangan Dan Jasa”). The latest survey includes separate questionnaires tailored to five sub-sectors: trade, restaurants, services related to communications, services supporting transportation, vehicle repairs and consulting activities. The purpose of the survey is to compute the structure of inputs and outputs of various sub-sectors. The main purpose of the survey of traders is to compute a trade margin to assign to various sectors in the Input-Output table. A value-added margin (defined as the trade margin less intermediate consumption) is then computed and aggregated by 5-digit ISIC, then to various sub-sectors in the production accounts. A ratio of the value-added margin to the value of production in that year is then computed.

Constant Prices

The ratio of value-added margin to total supply (defined as the sum of output and imports) from the 1995 survey is applied to total supply figures in constant prices of various sub-sectors of the production accounts computed above. Results are then summed up to produce the value added at constant prices of the Wholesale & Retail Trade sub-sector.

Current Prices

The ratio of value-added margin to the value of production from the 1995 survey is applied to the current prices supply of various sub-sectors of the production accounts computed above. Results are then summed up to produce the value added at current prices of the Wholesale & Retail Trade sub-sector.

2. Hotels

Constant Prices

No direct measure of the value added of this sector was available until 2000, when BPS started surveying this sub-sector to measure directly its output and value added. This survey will be run annually. Until data from the first survey are fully processed and results are evaluated, the indirect estimation method which had been used in the past will continue to be used. This method estimates only the contribution of hotels with a “star” ranking.²⁰ Monthly data on the number of foreign visitors to Indonesia are obtained from the Department of Tourism. These in turn are aggregated by quarter and a linear regression is estimated with value added as the dependent variable and the number of foreign tourists as the independent variable.

Current Prices

The constant price quarterly estimate is inflated using the “Recreational Services” component of the CPI.

3. Restaurants

Constant Prices

The current price quarterly estimate is deflated using the “Prepared Food” component of the CPI.

Current Prices

For 2000, as in previous years in which an Input-Output table was constructed, value added will be measured based on the special Trade & Services survey (SKSPJ). Until these results are available, and for lack of any source of primary data on the number and the output of restaurants, value added for this sub-sector is based on indirect estimates. The only available source of data on the output of this sub-sector is Susenas, and the closest variable in Susenas to the output of this sub-sector is household expenditure on prepared food (“makanan jadi”). Thus an annual measure of household expenditure on prepared food is calculated as the product of:

- a. expenditure per household based on the detailed Susenas conducted once every three years. This is then inflated to current year values using the “Prepared Food” component of the CPI.
- b. the number of households based on the core Susenas conducted annually.

²⁰

About 800 such hotels exist in addition to about 8800 hotels with no “star” ranking.

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Annual figures are then divided by four to obtain quarterly figures. A 5% markup is applied.

G. Transport & Communications

This includes two sub-sectors:

1. Transport

This sub-sector includes six activities:

Railway Transportation

Quarterly data on the number of passengers and total freight are obtained from PT Kereta Api Indonesia, the public enterprise managing this activity. Quarterly growth for each category is then calculated and applied to the relevant levels of the previous quarter. Current price estimates are obtained by inflating these figures by the “Transportation” component of the CPI.

Road Transportation

Annual data are obtained from the Department of Transportation for three commodities:

- passenger cars (number of passengers)
- buses (number of passengers)
- trucks (volume of freight)

Since the only quarterly data for any of the above commodities refer to data from two bus companies (PPD and Damri), the quarterly trend of passenger from these companies is applied to all other categories of road transportation.

Current price estimates are obtained by inflating these figures by the “Transportation” component of the CPI.

Ocean Transportation

Annual data are obtained for two commodities:

- passengers (number of passengers): obtained from PT PELNI, the public enterprise managing this activity
- freight (volume of freight): obtained from the Department of Transportation.

To produce quarterly estimates, the quarterly trend in the “Volume of Inter-Island Cargo Loaded at 4 Main Seaports” (produced by BPS) is used. Growth in volume for all four ports is used.

Current price estimates are obtained by inflating these figures by the “Transportation” component of the CPI.

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River, Lake and Ferry Transportation

Annual data are obtained from the Department of Transportation for three commodities:

- number of passengers
- volume of freight
- number of vehicles carried by ferry

To produce quarterly estimates, historical trends for each one of the commodities are used.

Current price estimates are obtained by inflating these figures by the “Transportation” component of the CPI.

Air Transportation

Annual data are obtained from the Department of Transportation for four commodities:

- number of passengers on domestic flights
- number of passengers on international flights
- freight carried on domestic flights (volume of freight)
- freight carried on international flights (volume of freight)

To produce quarterly estimates, the following quarterly trends are used (all published monthly in BPS’s “Indikator Ekonomi”):

- for the number of passengers on domestic flights: “Domestic Aircraft Passenger Traffic at 5 Main Airports”
- for the number of passengers on international flights: “International Aircraft Passenger Traffic at 4 Main Airports”
- for the volume of freight carried on domestic flights: “Volume of Domestic Aircraft Cargo Loaded/Unloaded at 5 Main Airports”
- for the volume of freight carried on international flights: “Volume of International Aircraft Cargo Loaded/Unloaded at 4 Main Airports”

Current price estimates are obtained by inflating these figures by the “Transportation” component of the CPI.

Services Supporting Transportation

For lack of data measuring directly this activity, the quarterly trend in freight activity is applied based on the following indicators (all published monthly in BPS’s “Indikator Ekonomi”):

- “Volume of Inter-Island Cargo Loaded/Unloaded at 4 Main Sea Ports”
- “Volume of International Cargo Loaded/Unloaded at 4 Main Sea Ports”
- “Volume of Domestic Aircraft Cargo Loaded/Unloaded at 5 Main Airports”
- “Volume of International Aircraft Cargo Loaded/Unloaded at 4

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Main Airports”

Current price estimates are obtained by inflating these figures by the “Transportation” component of the CPI.

2. Communications

This sub-sector includes three giant public enterprises: PT Indosat, PT Pos Indonesia and PT Telkom. The first two report only annually while the third one reports quarterly. All provide data on their value and volume of sales. Output of Indosat is computed using five commodities:

- telephone calls (number of minutes)
- telex (number of minutes)
- telegrams (number of words)
- direct telegraph transmission lines (meter usage measured in “sirkit”)
- direct data transmission lines (meter usage measured in “sirkit”)

For PT Pos Indonesia, output is computed using four commodities:

- number of letters
- number of packages
- money transfers (number of forms filled)
- checking/savings accounts “cek & giro”(number of transactions)

For PT Telkom, output is computed using four commodities:

- domestic telephone calls (meter usage)
- manual long-distance calls (minutes)
- telex (meter usage)
- telegrams (words)

A further estimate is made for “services related to communications” using the number of establishments involved in the “wartel/warpostel/warparpostel” activity obtained from PT Telkom. Quarterly trend in output for PT Telkom and PT Pos is applied to the annual output data of Indosat and for “services related to communications”, since the share of these companies in the sub-sector exceeds two-thirds. Both current and constant price data are then multiplied by the sub-sector’s value-added to output ratio (from the 1995 IO table) to obtain a value added figure and a further 5% markup is added (based on the 1995 IO table) for the contribution of other activities.

H. Financial, Ownership & Business Services

This includes five sub-sectors:

1. Banks

This sub-sector includes activities of three types of banking institutions: the central bank, commercial banks and small credit banks (“bank perkreditasi rakyat”).

Constant Prices

Quarterly current price figures are deflated as follows:

- a. Central bank: the “wages and salaries” component is deflated using the “General” component of the CPI. The other three components are deflated using the implicit total GDP deflator (excluding the banking sector) obtained from the production accounts.
- b. Commercial banks: the “wages and salaries” component is deflated using the “General” component of the CPI. The other three components of the income accounts are deflated using the implicit total GDP deflator (excluding the banking sector) obtained from the production accounts.
- c. Small credit banks: as is the case with current price figures, the average quarterly growth rate of value added of commercial banks is applied to these institutions.

Current Prices

Quarterly value added figures are computed as the sum of the following components:

- a. Central bank: value added figures computed using the production and the income (cost) approaches are obtained from Bank Indonesia. The income approach figures are divided into the four main components, namely employee compensation, depreciation, indirect taxes and operating surplus.
- b. Commercial banks: value added figures computed using the production and the income approaches are obtained from Bank Indonesia.²¹ Here again, the income approach figures are divided into the four main components as above.
- c. Small credit banks: for lack of any reliable quarterly (or annual) data allowing computation of value added for these institutions, the average quarterly growth rate of value added of commercial

²¹ These are computed by Bank Indonesia based on Form 02 (profit and loss statement) which banks are required to report monthly.

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banks is applied to these institutions.²²

2. Non-Bank Financial Institutions

This sub-sector includes activities of five types of institutions, each with its own computation methodology: insurance companies, pension funds, leasing companies, pawn shops and savings cooperatives.

Constant Prices

Current price figures are deflated as follows:

- a. Insurance companies: the “General” component of the WPI is used.
- b. Pension funds: the “General” component of the CPI is used.
- c. Leasing companies: the “General” component of the WPI is used.
- d. Pawn shops: the “General” component of the WPI is used.
- e. Savings cooperatives: the “General” component of the WPI is used.

Current Prices

Quarterly value added figures are computed as the sum of the following components:

- a. Insurance companies: annual output is computed from financial statements obtained from the Department of Finance.²³ A value-added to output ratio (from the 1995 IO table) is then applied. Quarterly figures are then derived using the average quarterly trend for the sub-sector in the past three years.²⁴
- b. Pension funds: annual value added is obtained from the annual survey of non-banking financial institutions (Survei Lembaga Keuangan Bukan Bank, LKBB) conducted by BPS for the purpose of computing the national flow of funds accounts. Quarterly figures are then derived using the average quarterly trend for the

²² In the benchmark annual accounts of 1993, the share of these institutions in value added of this sub-sector was about 1.5%.

²³ “Laporan Kegiatan Perasuransian di Indonesia”.

²⁴ These estimates are cross-checked against results from the annual survey of non-banking financial institutions (LKBB), results of which are available with a relatively long lag.

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sub-sector in the past three years. Since data from the survey are only available with a relatively long lag, preliminary growth rate of a particular quarter is estimated as the average real growth rate (in that activity) for that quarter in the past three years inflated by growth in the “General” component of the CPI.

- c. Leasing companies: annual output is computed from financial statements obtained from the Department of Finance. A value-added to output ratio (from the 1995 IO table) is then applied. Quarterly figures are then calculated using the average quarterly trend for the sub-sector in the past three years.
- d. Pawn shops: annual value added is computed from financial statements obtained from PT Perum Pegadaian, a public enterprise under the Department of Finance. Quarterly figures are then derived using the average quarterly trend for the sub-sector in the past three years.²⁵
- e. Savings cooperatives: value added of these institutions is assumed to be 1.5% that of the non-banking financial institutions, which was the share in the 1995 IO table. No special computation is made for this category. Rather, once value added of all above four categories is computed, a 1.5% markup is added to produce the value added of the non-banking financial institutions as a whole.

3. Services Related to Finance

This includes activities of three categories of institutions: capital markets, institutions related to capital markets and foreign exchange dealers.

Constant Prices

Current prices for each category of institution are deflated using the “general” component of the WPI.

Current Prices

Quarterly value-added figures are computed as the sum of the following components:

- a. Capital markets: annual output (or operating revenue) is computed from financial statements of the two institutions in this category: the Jakarta and the Surabaya Stock Exchanges. A value-added to

²⁵ These estimates are cross-checked against results from the annual survey of non-banking financial institutions (LKBB), results of which are available with a relatively long lag.

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output ratio (from the 1995 IO table) is then applied. Quarterly figures are then derived using the average quarterly trend for the sub-sector in the past three years.

- b. Institutions related to capital markets: quarterly value added trend of capital market institutions is applied here.
- c. Foreign Exchange Dealers: monthly data are obtained from Bank Indonesia for the volume as well as value of foreign exchange transactions. This is used as a proxy for output of these establishments. A value-added to output ratio (from the 1995 IO table) is then applied, and data are aggregated quarterly.

4. Building Rentals

This includes two types of rentals: dwelling and non-dwelling. For lack of any source of primary data on the number and the output of establishments undertaking these activities, value added for this sub-sector is based on indirect estimates

Constant Prices

Quarterly estimates at current prices are deflated using the “cost of housing” component of the CPI.

Current Prices

Quarterly value added is computed in the following steps:

- a. Dwelling:
 - monthly per capita expenditure on housing rent (both direct and imputed) is derived from the latest Susenas survey.
 - this value is converted into a current year value by applying the “cost of housing” component of the CPI.
 - a quarterly value is then calculated from the monthly values.
 - the quarterly per capita consumption is then multiplied by a quarterly estimate of the population (derived from the published BPS annual population estimates and subjected to a quarterly compound growth rate) to produce an estimate of output for this activity.
 - a value-added to output ratio (from the 1995 IO table) is then applied.

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- b. Non-Dwelling:
- quarterly bulletins are obtained from the real estate association of the Jabotabek and Surabaya property markets. These include data on office and shop rentals (both area and value).²⁶
 - a value-added to output ratio (from the 1995 IO table) is then applied.

5. Business Services

This includes six types of consulting services: legal, accounting, architectural, research, data processing and machinery rental. Annual data are obtained from an annual directory published by the associations of Indonesian Consultants (INKINDO), Accountants (IAI), Advertisers (Perum Perusahaan Periklanan Indonesia) and from the 1996 Economic Census.

Constant Prices

Quarterly estimates at current prices are deflated using the “general” component of the CPI.

Current Prices

Quarterly value added is computed in three steps:

- a. A quarterly number of consultants in each category is computed by applying the previous year’s quarterly trend to the current year’s annual level.
- b. A value-added per consultant is obtained from the special survey conducted for input-output tables (SKSPJ) and converted to a current year value by using the “general” component of the CPI.
- c. Value added per consultant (for each category) is then multiplied by the corresponding number of consultants in that category to produce the total value added for this sub-sector.

I. Services

This includes four sub-sectors:

²⁶ These numbers are cross-checked against data published by some of the largest real estate service companies (e.g. Jones Lang LaSalle) for plausibility.

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1. General Government

This involves two activities: government administration and defense and other government services.

Constant Prices

Quarterly estimates are calculated as follows:²⁷

- a. An annual Laspeyres-type quantity index for employees is computed, aggregating the number of civil servants over the four major ranks (“golongan”) and using 1993 compensation levels as numeraire.
- b. An increase in the index over the previous year is then derived and interpolated among the four quarters of the current year.
- c. This quarterly increase is then multiplied by the previous quarter’s level.

Current Prices

Quarterly value-added figures are computed for the central, provincial, regency and village governments in three steps:

- a. Total value added for this sub-sector is calculated using the income (cost) approach as the sum of two components:²⁸
 - employee compensation: this includes wages and salaries as well as fringes (e.g. various allowances paid and contributions made for insurance, pension, social security etc.) provided to civil servants. The source of data for the central government figures is a quarterly report received from the Department of Finance on realized expenditures. For the other three levels of government, data are obtained annually and

²⁷ The current methodology is used for lack of reliable and consistent detailed current data on employee compensation and number of employees. A more common methodology would involve deflating current price estimates by an index for compensation per employee (aggregating compensation over the four major ranks in the civil service and using 1993 levels as a numeraire). An attempt to obtain such data regularly from both the Department of Finance and the Civil Service Agency (BKN) is underway, and results using this methodology will be evaluated.

²⁸ Conceptually, indirect taxes should also be added. However, they are omitted in this case because the three levels of government in Indonesia pay no indirect taxes.

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divided equally among the quarters.

- consumption of fixed capital: this item technically covers appropriately amortized expenditure on buildings, vehicles, equipment, machinery, furniture and fixtures and the like. The level of these expenditures is estimated at 5% that of employee compensation.²⁹
- b. Other government services: this activity includes educational, health, social, cultural and recreational services provided by various government institutions. Quarterly value added for these services is computed as follows:
 - A special survey is conducted annually by BPS to determine the number of employees hired by institutions providing each of the above services as well as their compensation.³⁰ The 2000 survey covered about 300 offices at the central, provincial (“kanwil”), kabupaten (“kandep”) and local (“dinas”) levels as well as non-departmental institutions (“lembaga non-departemen”).³¹
 - The ratio of employee compensation for the above services to total employee compensation is then derived from the special survey, averaged out over these institutions, then applied to the total employee compensation figure in a above. This is then augmented by a 5% estimate for consumption of fixed capital for this activity.
- c. Administration and defense: value added for this activity is then computed as the difference between total value added of the sub-sector (from a.) and that of other government services (from b).

²⁹ This was based on an analysis of annual realized expenditures (covering the 1994/95 - 1997-98 period) which found a more or less stable relationship between the two variables. Specific budget line items included in consumption of fixed capital are: land (budget code: 5910), machinery & equipment including vehicles (budget code: 5920, depreciated over 20 years), buildings (budget code: 5930, depreciated over 30 years), roads, bridges & the like (budget code: 5940, depreciated over 40 years) and other physical capital goods (budget code: 5950, depreciated over 20 years).

³⁰ “Survei Khusus Jasa Pemerintah” (SKJP).

³¹ Starting in 2001, and following the decentralized structure of government in Indonesia, the geographic breakdown of government institutions will change. Coverage of the 2001 survey will, therefore, differ from that of previous years.

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2. Social & Community Services

This involves two major activities: education and health.

Constant Prices

Quarterly value added is computed using the following steps:

- a. Education:
 - Annual data are obtained from the Department of Education on private school enrolment at six levels of education (kindergarten, “special school”, primary, junior and senior high school as well as for higher education).
 - This is then converted to a quarterly figure by applying an estimated quarterly population trend (derived from the published BPS annual population estimates and subjected to a quarterly compound growth rate).
 - The average quarterly expenditure (as a proxy for output) per student in 1993 prices is multiplied by the estimated number of students by level of education.
 - A value-added to output ratio (from the 1995 IO table) is then applied.

- b. Health:
 - Annual data are obtained from the Department of Health on three variables: the number of beds in hospitals, the number of doctors and the number of midwives in major urban areas.
 - This is then converted to a quarterly figure by applying an estimated quarterly population trend (derived from the published BPS annual population estimates and subjected to a quarterly compound growth rate).
 - The average quarterly expenditure (as a proxy for output) per bed/doctor/midwife in 1993 prices is multiplied by the estimated number of beds/doctors/midwives.
 - A value-added to output ratio (from the 1995 IO table) is then applied.

- c. The totals for the above two activities are then summed up and a further markup of 5% is applied to arrive at the total value added for the sub-sector.

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Current Prices

Quarterly value added is computed using the following steps:

- a. Education:
 - An average annual output per student is obtained from supporting tables used in compiling the 1995 IO table, and converted to a current year value by using the “education” component of the CPI. This is then divided by four to reflect a quarterly figure.
 - Quarterly output per student is multiplied by the estimated number of students (from the constant price computations above).
 - A value-added to output ratio (from the 1995 IO table) is then applied.

- b. Health:
 - An average annual output per bed/doctor/midwife is obtained from supporting tables used in compiling the 1995 IO table, and converted to a current year value by using the “health services and medicines” component of the CPI. This is then divided by four to reflect a quarterly figure.
 - Quarterly output per bed/doctor/midwife is then multiplied by the estimated number of beds/doctors/midwives (from the constant price computations above).
 - A value-added to output ratio (from the 1995 IO table) is then applied.

- c. The totals for the above two activities are then summed up and a further markup of 5% is applied to arrive at the total value added for the sub-sector.

3. Amusement & Recreation

This involves three activities: movie theater operation, TV and radio broadcasting and movie production.

Constant Prices

Quarterly value added is computed using the following steps:

- a. Movie theater operation:
 - A quarterly number of movie goers is projected as the product of the previous quarter’s figure and the

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- average growth (in that activity) for that quarter in the past three years.
- The average quarterly output per movie goer in 1993 prices is multiplied by the estimated number of movie goers.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- b. TV and radio broadcasting:
- Quarterly data are obtained from the association of radio/TV broadcasters on the number of TV and radio stations.
 - The average quarterly output per station in 1993 prices is multiplied by the number of stations.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- c. Movie production:
- Annual data are obtained from the Department of Tourism on the number of movies produced.
 - This is then converted to a quarterly figure by using the quarterly trend in the past three years.
 - The average quarterly cost of production per movie in 1993 prices is multiplied by the estimated number of movies.
 - A value-added to output ratio (from the 1995 IO table) is then applied
- d. The totals for the above three activities are then summed up and a further markup of 5% is applied to produce the total value added for the sub-sector.

Current Prices

Quarterly value added is computed using the following steps:

- a. Movie theater operation:
- An average annual output per movie goer is obtained from supporting tables used in compiling the 1995 IO table, and converted to a current year value by using the “recreation and sports” component of the CPI. This is then divided by four to reflect a quarterly figure.
 - Quarterly output per movie goer is multiplied by the estimated number of movie goers (from the constant price computations above).

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- A value-added to output ratio (from the 1995 IO table) is then applied.
- b. TV and radio broadcasting:
 - A quarterly average output per station is obtained from the association of radio/TV broadcasters, which is multiplied by the estimated number of stations.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- c. Movie production:
 - An annual average cost of production per movie is obtained from supporting tables used in compiling the 1995 IO table, and converted to a current year value by using the “recreation and sports” component of the CPI. This is used as a proxy for output per movie, it is then divided by four to reflect a quarterly figure.
 - The quarterly output per movie is then multiplied by the estimated number of movies produced.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- d. The totals for the above three activities are then summed up and a further markup of 5% is applied to arrive at the total value added for the sub-sector.

4. Personal & Household Services

This involves three major activities: vehicle repair, other repairs and domestic servants.

Constant Prices

Quarterly value added is computed using the following steps:

- a. Vehicle repair:
 - Annual data are obtained from the Department of Transportation on the number of vehicles on the road. This is multiplied by a fraction based on supporting tables used in computing the 1995 IO table representing the percentage of vehicles on the road subjected to repair.
 - This is then converted to a quarterly figure by using the quarterly trend in the past three years.

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- The quarterly average output per vehicle in 1993 prices is multiplied by the estimated number of vehicles in repair.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- b. Other repairs:
- Annual data are obtained from Susenas on the number of workers performing this activity.
 - This is then converted to a quarterly figure by using the quarterly trend in the past three years.
 - The quarterly average output per worker in 1993 prices is multiplied by the estimated number of workers.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- c. Domestic servants:
- Annual data are computed by BPS on the number of households, which are then converted to a quarterly figure by applying a compound growth rate.
 - The quarterly average household expenditure per servant in 1993 prices is multiplied by the estimated number of households.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- d. The totals for the above three activities are then summed up and a further markup of 5% is applied to produce the total value added for the sub-sector.

Current Prices

Quarterly value added is computed using the following steps:

- a. Vehicle repair:
- An average output per vehicle (measured by the cost of repair) is obtained from the special survey conducted for the Trade and Services sectors (SKSPJ), and converted to a current year value by using the “transportation” component of the CPI, then divided by four to reflect a quarterly figure.
 - Output per vehicle is then multiplied by the estimated number of vehicles in repair.
 - A value-added to output ratio (from the 1995 IO table) is then applied.

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- b. Other repair:
- An average output per worker is obtained from supporting tables used in compiling the 1995 IO table, and converted to a current year value by using the “household equipment” component of the CPI, then divided by four to reflect a quarterly figure.
 - Output per worker is then multiplied by the estimated number of workers.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- c. Domestic servants:
- An average household expenditure on servants is obtained from Susenas and converted to a current year value by using the “household operation” component of the CPI. This is then divided by four to reflect a quarterly figure.
 - Expenditure per household is then multiplied by the estimated number of households.
 - A value-added to output ratio (from the 1995 IO table) is then applied.
- d. The totals for the above three activities are then summed up and a further markup of 5% is applied to produce the total value added for the sub-sector.

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III. COMPILATION OF EXPENDITURE ACCOUNT

The expenditure account takes the GDP computed from the production account as the benchmark and then attempts to reconcile estimations of various components with that benchmark. Tables 3 and 4 summarize the basic methodologies used for compiling various sectors for constant and current price estimates respectively, and the sections that follow describe sectoral methodologies in more detail.

Table 3
Summary of Sources & Methods of Expenditure Account at Constant Prices

Sector	Data Sources	Basic Methodology
Private Consumption Expenditure	Susenas, Production Accounts, CPI	Use consumption elasticity with respect to GDP, apply to quarterly GDP. Incorporate adjustment in current price estimate by deflating by relevant component of CPI.
Government Consumption Expenditure	Current price series, quantity index of civil service employees, WPI	Personnel Expenditure & Depreciation: use growth in quantity index Material expenditure: apply WPI to current price series
Gross Domestic Fixed Capital Formation	Prod. Accounts, imports, Industry Survey	Construction: obtained from quarterly production accounts Machinery: monthly imports multiplied by rupiah at 1993 prices. Domestic production multiplied by growth in the production index Transportation: monthly imports multiplied by rupiah at 1993 prices. Domestic production multiplied by growth in the production index Other: apply markup
Change in Stocks	Current price series, WPI	Apply WPI to current price series
Exports of Goods & Services	Current price series, \$ value index	Apply price changes in index to current price series
Imports of Goods & Services	Current price series, \$ value index	Apply price changes in index to current price series

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Table 4
Summary of Sources & Methods of Expenditure Account at Current Prices

Sector	Data Sources	Basic Methodology
Private Consumption Expenditure	constant price series, CPI	Apply relevant CPI component to constant price series. Apply iterative adjustments to reconcile supply and demand
Government Consumption Expenditure	budgets of central, level I, level II & village gov.	Relevant budget allocations + depreciation
Gross Domestic Fixed Capital Formation	constant price series, WPI	Construction: obtained from quarterly production accounts Machinery: monthly imports converted to rupiah. Domestic production in constant prices inflated by relevant WPI component. Transportation: monthly imports converted to rupiah. Domestic production in constant prices inflated by relevant WPI component. Other: apply markup
Change in Stocks	IO table	Start with same share in supply from IO table. Apply iterative adjustment to reconcile supply and demand.
Exports of Goods & Services	Services/Trade Bureau	Goods: get export value for 7 commodity groups; services: use trend in goods
Imports of Goods & Services	Services/Trade Bureau	Goods: get import value for 7 commodity groups; services: use trend in goods

A. Private Consumption Expenditure

Constant Prices

Estimates of private consumption are computed iteratively using to the following steps:³²

- a. First, annual consumption elasticities with respect to GDP are computed from the Susenas survey (conducted once every 3 years) for the following 13 commodities and commodity groups:
 - “Food, Beverages and Tobacco”: rice, roots, fish, meats, dairy products, vegetables, beans, fruits, other foods, prepared foods, alcoholic drinks, tobacco. For each commodity, data are available for both quantity and value.
 - Non- “Food, Beverages and Tobacco”: no breakdown is attempted for this group since only data on values are available.

Algebraically, this is calculated as:

³² Another approach for measuring private consumption expenditure relies on the commodity flow method. The Bureau is currently evaluating a methodology which would provide a direct measurement of the changes in stock, to allow measurement of private consumption as a residual at the sectoral level, which is what the commodity flow technique does.

$$\varepsilon = \frac{\frac{\frac{\Delta C_i}{C_i}}{\frac{\Delta GDP}{GDP}}}{\frac{C_i}{GDP}}$$

where ε_i is the elasticity computed for item i
 C_i/C_i the percentage change in consumption of item i
 GDP/GDP the percentage change in GDP computed in the production accounts.

For the first category of commodities, C_i refers to the quantity consumed whereas for the second category it refers to the value of consumption deflated by the “general” component of the CPI.

- b. These elasticities are then multiplied by the change in GDP in the production accounts during the quarter to arrive at an estimated relative change in consumption for various items during the quarter, which is in turn multiplied by the consumption level of the previous quarter to obtain the preliminary estimate of consumption for the current quarter. That is,

$$C_i^{II} = C_i^I \left(1 + \varepsilon \frac{\Delta GDP^{II}}{GDP^I} \right)$$

where superscripts refer to relevant quarters.

- c. Following a reconciliation of the current price estimates within the context of a Supply and Use table, adjustments to the estimated consumption levels are made and the new numbers are deflated using the relevant components of the CPI.

Current Prices

The preliminary constant price consumption expenditures are inflated using the CPI:

- a. For “Food Beverages & Tobacco” items: the corresponding component of the CPI is used
- b. For Non- “Food, Beverages & Tobacco”, the “general” CPI index is used.

The derived consumption levels are then subjected to a reconciliation using a quarterly Supply and Use table (a simplified format is provided in Table 5). Such a table allows reconciliation of supply and demand using the following accounting identity:

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$$SS + M = INT + C_p + C_g + GDFI + \Delta S + X \quad (6)$$

Where SS is domestic supply
C_p private consumption expenditure
C_g government consumption expenditure
GDFI gross domestic fixed investment
S change in stocks
X exports of goods and services
M imports of goods and services
INT intermediates

Table 5
Content of Supply & Use Table for Reconciling Expenditure Account

Sector	Supply ¹	Use				
		Intermediates ²	Private Consumption ³	Government Consumption ⁴	Fixed Investment ⁵	Exports
Farm Food Crops						
Non-Food Crops						
Livestock						
Forestry						
Fishery						
Crude Petrol. & Nat. Gas						
Non-Oil & Gas Mining						
Quarrying						
Petroleum Refining & LNG						
Food, Bev. & Tobacco						
Textiles, Leather, Footwear						
Wood Products						
Paper & Printing						
Fertilizers, Chemicals						
Cement Products						
Basic Iron & Steel						
Transportation Equipment						
Other Manufacturing						
Electricity, Gas & Water						
Construction						
Trade						
Hotels & Restaurants						
Railway Transportation						
Road Transportation						
Sea Transportation						
Air Transportation						
Other Transportation						
Communications						
Financial Services						
Rentals & Housing Services						
Public Administration						
Social Services						
Other Services						
Total						

Notes:

- 1) Supply has two components: domestic production (obtained from the production accounts) and imports (obtained from the Trade & Services Bureau). Imports are divided into three categories: consumption goods, raw materials and capital goods.
- 2) Value of intermediate inputs is obtained from the production accounts.
- 3) Private Consumption is computed using consumption elasticities of income applied to domestic production
- 4) Government consumption expenditure is obtained from the government budget documents.
- 5) Fixed investment is divided into: gross domestic fixed capital formation and changes in stocks.

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The initial estimate of consumption is used as well as an initial estimate of stock changes (using the same shares in total supply in the 1995 IO table). A judgmental allocation of the residual (between consumption and stock changes) is then made for each item taking three constraints into consideration:

- supply and demand should balance
- the ratio of stock changes to total supply should not deviate substantially from that of the 1995 IO table
- the derived elasticity of consumption with respect to GDP should remain plausible, and not deviate substantially from that estimated in the previous quarter.

B. Government Consumption Expenditure

Constant Prices

Quarterly estimates are calculated as follows:

- “Personnel Expenditure” and Depreciation: growth in the quantity index of government employees (computed for measuring value added of government services at constant prices) is applied to the levels of the previous quarter.³³
- “Material Expenditure:” current price estimates are deflated using the “general” component of the WPI.

Current Prices

Estimates of government consumption expenditure rely primarily on central government budget data, which are produced quarterly. Three sources are used for local government expenditure (all published annually by BPS): *Financial Statistics of the First Level Local Government*, *Financial Statistics of the Second Level Local Government* and *Financial Statistics of Village Government*. Quarterly estimates are then derived by dividing annual expenditure equally.

Computations for each type of government use the following relationships:

$$\begin{array}{rcl}
 & \text{Allocation for “Personnel Expenditures” in the budget} & \\
 + & \text{Allocation for “Material Expenditures” in the budget} & \\
 + & \text{Depreciation (in the budget)} & \\
 = & \text{Total revenues available in the budget for government’s own current use} & \\
 - & \text{Non-budget revenue from services} & \\
 - & \text{Non-budget revenue from material sales} & \\
 = & \text{Government consumption expenditure} &
 \end{array}$$

³³

A more common methodology is to deflate current price estimates by an index of average compensation per employee, which will be evaluated by the bureau.

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C. Export of Goods & Services

Constant Prices

The total level of exports in current prices is deflated using a quarterly aggregate export index of dollar values converted into rupiah at an average quarterly exchange rate, with the average quarterly 1993 values used as a numeraire.³⁴

Current prices

Dollar (fob) values of goods exported are obtained monthly from the Trade & Services Bureau by 2-digit HS code. These are then assigned to the following commodity groups:

- crude oil
- oil products
- gas
- agricultural products
- manufacturing products
- mining products
- all others

These values are then summed up by quarter and converted to rupiah at the average quarterly exchange rate.

For services, initial estimates use the same quarterly trend of goods. However, BPS has recently begun receiving detailed monthly data on services from Bank Indonesia (as part of the Balance of Payments). Direct measurement of services exports will, therefore, be possible.

D. Imports of Goods & Services

Constant Prices

The total level of total imports in current prices is deflated using a quarterly aggregate export index of dollar values converted into rupiah at an average quarterly exchange rate, with the average quarterly 1993 values used as a numeraire.³⁵

Current Prices

Dollar (cif) values of goods imported are obtained monthly from the Trade & Services Bureau by 2-digit HS code. These are then assigned to the following commodity groups:

- Consumption goods
- Raw materials

³⁴ The Trade & Services Bureau is currently devising new unit price deflators for exported goods to provide a more appropriate measure of these flows at constant prices.

³⁵ The Trade & Services Bureau is currently devising new unit price deflators for imported goods to provide a more appropriate measure of these flows at constant prices.

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- Capital goods

These values are then summed up by quarter and converted to rupiah at the average quarterly exchange rate.

For services, initial estimates use the same quarterly trend of goods. However, BPS has recently begun receiving detailed monthly data on services from Bank Indonesia (as part of the Balance of Payments). Direct measurement of services exports will, therefore, be possible.

E. Gross Domestic Fixed Capital Formation

Constant Prices

GDFCF is calculated using four components:

- a. Construction: this is the gross value obtained from the quarterly production accounts (at constant prices)
- b. Machinery: this includes both imported and domestic components. Current price estimates for imported capital goods are deflated using the relevant component of the WPI. For domestic production of machines, quarterly indices are obtained from the production accounts, and are applied to the constant price series.
- c. Transportation Equipment: this includes both imported and domestic components. Current price estimates for imported equipment are deflated using the relevant component of the WPI. For domestic production of transportation equipment, quarterly indices are obtained from the production accounts, and are applied to the constant price series.
- d. Other: this includes cattle, seeds, land preparation and the like. To allow for these capital goods, a markup of about 10% is added to the sum of the other three components.

Current Prices

GDFCF is calculated using four components:

- a. Construction: this is the value obtained from the quarterly production accounts (at current prices)
- b. Machinery: this includes both imported and domestic components. Data on imported machinery are obtained monthly from the Trade & Services Bureau. Dollar values are converted to rupiah at the

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average monthly exchange rate. A quarterly figure is then computed.

For domestic production of machines, constant price figures are inflated using the relevant WPI component.

- c. **Transportation Equipment:** this includes both imported and domestic components. Data on imported transportation equipment are obtained monthly from the Trade & Services Bureau. Dollar values are converted to rupiah at the average monthly exchange rate. A quarterly figure is then computed. For domestic production of transportation equipment, constant price figures are inflated using the relevant WPI component.
- d. **Other:** a markup of about 10% is added to the sum of the other three components.

F. Changes in Stocks

Constant Prices

The total level of stock changes at current prices is deflated using the “general” index of the WPI.

Current Prices

Due to a lack of data on this flow, it is computed iteratively (together with private consumption).³⁶ An initial estimate using the same share in total supply in the 1995 IO table is used in the reconciliation of the Supply and Use table. A judgmental allocation of the residual (between consumption and stock changes) is then made for each item taking three constraints into consideration:

- supply and demand should balance
- the ratio of stock changes to total supply should not deviate substantially from that of the 1995 IO table
- the derived elasticity of consumption with respect to GDP should remain plausible, and not deviate substantially from that estimated in the previous quarter.

³⁶ The Bureau is currently evaluating a methodology which would provide a direct measurement of this flow, and consequently allow measurement of private consumption as a residual. That method would conform with the commodity flow technique.

APPENDIX A

COMMODITIES USED IN MANUFACTURING PRICE INDICES

In computing non-oil manufacturing value added, commodity output in constant prices is inflated by using relevant components of the WPI (see Section II.C.3). Table A.1 provides a mapping of commodities in the WPI and their corresponding 3-digit ISIC.

Table A.1
Mapping of Commodities in the WPI and Corresponding ISIC

ISIC	Commodities in the WPI which are included in price indices applied to medium and large establishments	Commodities in the WPI which are included in price indices applied to small and cottage establishments
311	Daging Sapi Daging Kerbau Daging Babi Daging Kambing & Domba Daging Ayam Susu Kental Manis Susu Bubuk Kaleng Susu Tepung & Susu Bubuk Pengolahan/Pengawetan Ikan Ikan Dalam Kaleng Ikan Pindang Asin Sayur-sayuran & Buah-buahan Minyak Kelapa Minyak Goreng Mentega/Margarine Beras Tepung Terigu Tepung Tapioka Biskuit Roti Mie & Sejenisnya Gula Pasir Kembang Gula Sirop	Daging Sapi Daging Kerbau Daging Babi Daging Kambing & Domba Daging Ayam Ikan Pindang Asin Minyak Kelapa Minyak Goreng Beras Tepung Tapioka Roti Mie & Sejenisnya Kembang Gula
312	Kopi Bubuk Teh Kecap Tahu & Tempe Bumbu Masak/Penyedap Makanan Kerupuk Coklat Bubuk Garam Makanan Ternak/Hewan	Kopi Bubuk Teh Kecap Tahu & Tempe Bumbu Masak/Penyedap Makanan Kerupuk Coklat Bubuk Garam Makanan Ternak
313	Minuman Keras Minuman Ringan	Minuman Keras Minuman Ringan
314	Tembakau Rokok Putih Rokok Kretek	Tembakau Rokok Kretek
321	Benang Tenun Benang Sintetis	Benang Tenun

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	Kain Tenun Kain Sintetis Batik Handuk/Selimut & Seprai Karpét/Permadani	Batik
322	Pakaian dari Kaos Pakaian Pria Pakaian Wanita Pakaian Anak-anak	Pakaian dari Kaos Pakaian Pria Pakaian Wanita Pakaian Anak-anak
323	Kulit Sapi/Kerbau & Kambing	Kulit Sapi/Kerbau & Kambing
324	Sepatu Pria Dewasa Sepatu Wanita Dewasa Sepatu Anak-anak Sepatu Olah Raga	Sepatu Pria Dewasa Sepatu Wanita Dewasa Sepatu Anak-anak Sepatu Olah Raga
331	Kayu Jati Gergajian Kayu Rimba Gergajian Plywood, Teakwood & Triplek Kusen Jadi, Daun Pintu, dll	Kayu Jati Gergajian Kayu Rimba Gergajian Kusen Jadi, Daun Pintu, dll
332	Keranjang Bambu/Rotan Meja Kursi, Meja Tulis, sll	Keranjang Bambu/Rotan Meja Kursi, Meja Tulis, dll
341	Kertas Tulis dan sejenisnya Buku Tulis dan sejenisnya Kertas Tissue Kertas Karton	Buku Tulis dan sejenisnya
342	Barang Cetakán	Barang Cetakán
351	Pupuk Urea Pupuk Lainnya Pembasmi Hama Pembasmi Nyamuk Barang-barang Kimia	Pupuk Lainnya Pembasmi Nyamuk
352	Cat Kayu/Besi Cat Tembok Barang Cat Lainnya Macam-macam Obat Jamu Segala Jenis Sabun Cuci, Detergen, dll Sabun Mandi Tapal Gigi Kosmetik lainnya Film/Kertas Photo Minyak Atsiri	Jamu segala jenis Sabun cuci, detergen, dll Kosmetik Lainnya Minyak Atsiri
353,	Avigas Avtur Super 98 Premium Minyak Tanah Solar Minyak Diesel Minyak Bakar Aspal Gas Minyak Cair Minyak Pelumas Segala Jenis	
355	Ban Kendaraan Ban Sepeda Motor Ban Sepeda Karet RSS1, RSS11, dsb Sepatu Karet	Karet RSS1, RSS11, dsb Sepatu Karet
356	Pipa PVC	Pipa PVC

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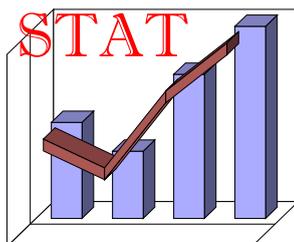
361	Tegel, Porselin, Kloset, dll	Tegel, Porselin, Kloset, dll
362	Kaca Lembaran	
	Gelas, Piring dan Sejenisnya	Gelas, Piring, dan sejenisnya
363	Semen	Batako, Eternit, Asbes, dll
		Ubin Teraso dan sejenisnya
364	Batu bata, Genteng dan lainnya	Batu Bata, Genteng dan lainnya
369	Batako, Eternit, Asbes, dll	Batako, Eternit, Asbes, dll
	Ubin Teraso dan sejenisnya	Ubin Teraso dan sejenisnya
371	Besi Beton	
	Besi Propil	
	Besi Plat	
	Kawat Beton (bindrad)	
372	Emas	
	Perak	
	Logan Timah	
381	Cangkul	Cangkul
	Tempat Tidur, Kursi dari Besi	
	Seng	
	paku, Kawat, dan lainnya	Paku, kawat, dan lainnya
382	Alat-alat Berat	
	Mesin-mesin Industri	Mesin-mesin Industri
383	Televisi	
	Radio	
	Tape Recorder	
	Casset	
	Kipas Angin	
	Mesin Jahit	
	Air Condition	
	Lemari Es	
	Generator Set	
	Transformator dan sejenisnya	
	Batu Baterei	
	Aki (Accu)	
	Lampu	Lampu
	Kabel Listrik	Kabel Listrik
384	Mobil	Alat-alat Angkutan
	Sepeda Motor	
	Sepeda	
	kapal Laut	
385	Alat Photo/Optik	
	Arloji, Jam Dinding, dll	
390	Alat-alat Olah Raga	Alat-alat Olah Raga
	Alat Musik	Alat Musik

SELECTED ISSUES IN LABOR FORCE STATISTICS

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Statistical Paper # 4

By
Vijay Verma

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Selected Issues in Labor Force Statistics

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I. QUARTERLY LABOR FORCE DATA: BASIC RECOMMENDATIONS

At present, labor force data are obtained twice a year: once from the labor force survey (Sakernas), and once from the socio-economic survey (Susenas). The Sakernas sample has been reduced recently, and now stands at around 42,000 households. The Susenas sample is much bigger.

There is a need to produce quarterly estimates of employment and unemployment at the national level. It is not possible to expand the sample size to meet the need for quarterly data.

This report makes the following recommendations:

1. The Sakernas enumeration should be divided into four quarterly rounds. Each round will cover a nationally representative sample of households and persons. Within the quarter, the fieldwork may be concentrated to be within a few weeks (as in the present Sakernas), or may be more or less uniformly distributed throughout the quarter.
2. The total sample size for the four quarters combined will be similar to the total sample size of the present annual survey. However, it would be desirable to increase the sample size somewhat (say by 30-50%), if possible.
3. Such an increase can be paid for by removing the enumeration of labor force questions in Susenas.
4. As to the structure of the Sakernas sample over time, a rotational design is recommended. This means that a certain proportion of the addresses enumerated in one quarter are retained for re-enumeration in the next quarter, while the remainder of the sample is changed.
5. A high degree of overlap in the sample is desirable from the point of view of estimating quarter-to-quarter change; while a low degree of sample overlap is preferred for efficient aggregation of the quarterly data to produce annual estimates. As a compromise, a moderate level of overlap – such as 50% from one quarter to the next - is proposed.

A. Pattern of Sample Rotation

The recommended pattern is illustrated in Figure 1. The sample has been divided into a number of independent subsamples. Each subsample is representative of the whole country; different subsamples are same or very similar in size and structure. Each quarter, one new subsample is introduced into the survey. This subsample is retained for two consecutive quarters, and is then dropped from the survey.

Thus in any one quarter, two subsamples are enumerated: one newly introduced, and the

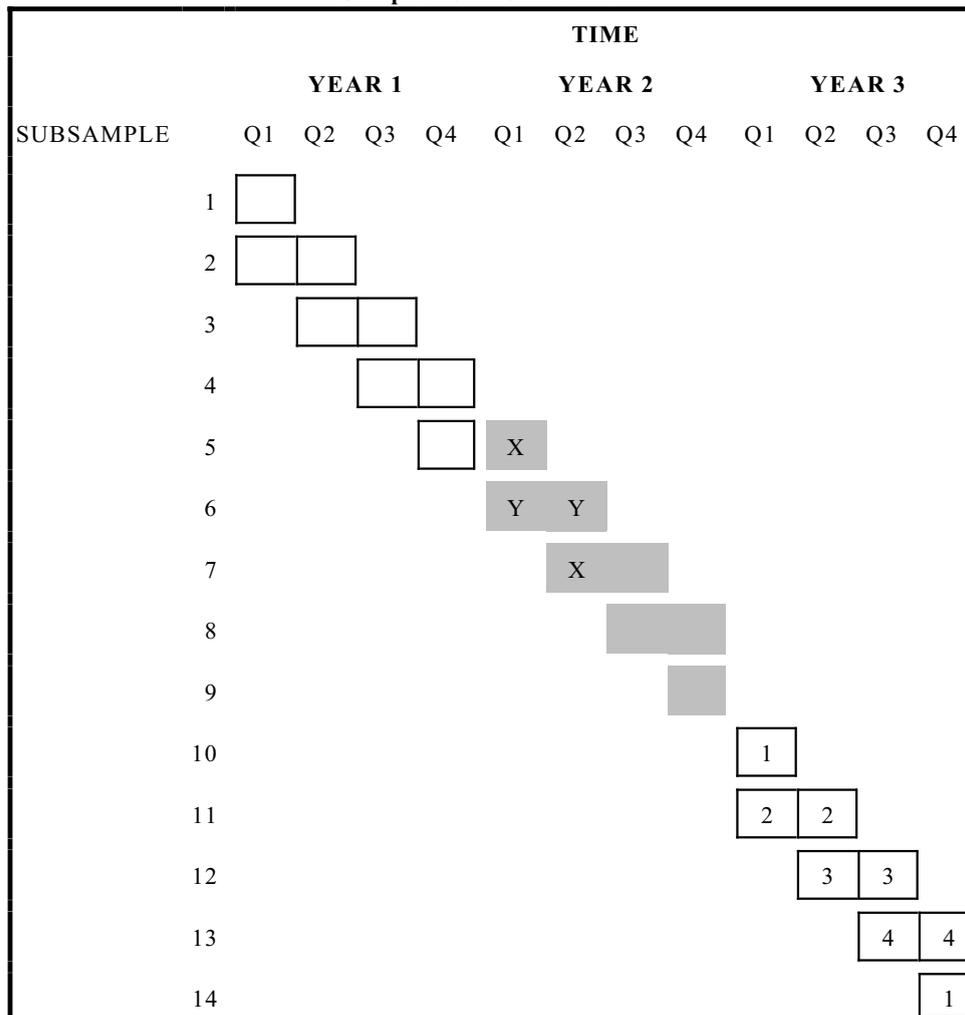
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other retained from the previous quarter. The new subsample is carried forward to the next quarter, and the other one is dropped and replaced by a new subsample in the next quarter.

This system gives a 50% overlap in the sample between two consecutive quarters. (Special arrangement is required to start the system in the first quarter of year 1. Here two subsamples are introduced at the same time, and one of those is dropped after only one enumeration.)

Figure 1
Sample Rotational Pattern



B. Variance of the Estimators

Consider single enumeration of one subsample. (This is represented by a square in the above diagram.) There are two such enumerations each quarter, and eight per year. The sample size of one such enumeration is of the order of 1/8th of the current sample size of the annual Sakernas – or a little bigger than that if possible.

Let V be the variance of some estimate such as the unemployment rate from one such enumeration. (For simplicity, we assume this to be the same for all such enumerations, which is

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reasonable if the subsamples are of the same size and design.) With the sample size as 1/8th the annual sample size, V is around eight times as large as the variance of the same statistic from the present annual survey.

1. Quarterly Level

The variance of an estimate (a mean, proportion, ratio etc) for a quarter is V/2, since the sample size is doubled by having two subsamples. This sort of statement can be expressed more generally as follows. Suppose the sample is made up of different (and independent) subsamples h, of relative size (or weight) W_h . A statistic such as the mean is estimated as the weighted sum of subsample means:

$$[1] \quad \bar{y} = \sum_h W_h \bar{y}_h$$

$$[2] \quad \text{with } \sum_h W_h = 1.0.$$

Because the subsamples are independent, we have

$$[3] \quad \text{var}(\bar{y}) = \sum_h \text{var}(W_h \cdot \bar{y}_h) = \sum_h W_h^2 \cdot \text{var}(\bar{y}_h)$$

In the above example for the quarter, $W_h=0.5$, and $\text{var}(y_h)=V$, so that the left hand side becomes $= (0.25 \cdot V + 0.25 \cdot V)$

$$[4] \quad \text{variance, quarterly level} = V/2.$$

2. Change From One Quarter to the Next

As can be seen from the above diagram, change between quarters is measured by the comparison based on two pairs of basic enumerations: one pair consisting of two independent samples (X-X); and the other consisting of two enumerations over the same sample (Y-Y).

For the first pair, variance of the difference between the two quarters is

$$[5] \quad \text{var1} = (V+V) = 2 \cdot V.$$

For the second case, this variance is reduced due to correlation (R) between the two enumerations:

$$[6] \quad \text{var2} = (V+V-2 \cdot R \cdot V) = 2 \cdot V \cdot (1-R).$$

Putting these together with weights $W_h=0.5$ as above, variance in estimating difference between

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consecutive quarters is

[7] $\text{variance, quarterly change} = V \cdot (1 - R/2).$

With zero correlation (or in the absence of an overlap) variance in estimating difference between consecutive quarters is

[8] $=V,$

which is twice as large as that in estimating quarterly levels.

The column marked (A) in Table 1 shows how the variance is reduced due to overlap, compared to a sample with no overlap (or zero correlation R). The extent of the gain in precision depends on the value of the average correlation R between observations with overlapping samples in the two quarters. With R=0.6 for instance, the 50% overlap reduces the variance from V (without overlap) to 0.7*V, i.e. by 30%.

Table 1
Variance of the difference between two quarters (relative values)

correlation (R)	relative weight given to non-overlapping part (overlapping part=1.0)											(A) Minimum/ Optimal	
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	col(A)	weight
0.0	2.000	1.669	1.444	1.290	1.184	1.111	1.063	1.031	1.012	1.003	1.000	1.00	1.0
0.1	1.800	1.504	1.306	1.172	1.082	1.022	0.984	0.962	0.951	0.947	0.950	1.00	0.9
0.2	1.600	1.339	1.167	1.053	0.980	0.933	0.906	0.893	0.889	0.892	0.900	0.99	0.8
0.3	1.400	1.174	1.028	0.935	0.878	0.844	0.828	0.824	0.827	0.837	0.850	0.97	0.7
0.4	1.200	1.008	0.889	0.817	0.776	0.756	0.750	0.754	0.765	0.781	0.800	0.94	0.6
0.5	1.000	0.843	0.750	0.698	0.673	0.667	0.672	0.685	0.704	0.726	0.750	0.89	0.5
0.6	0.800	0.678	0.611	0.580	0.571	0.578	0.594	0.616	0.642	0.670	0.700	0.82	0.4
0.7	0.600	0.512	0.472	0.462	0.469	0.489	0.516	0.547	0.580	0.615	0.650	0.71	0.3
0.8	0.400	0.347	0.333	0.343	0.367	0.400	0.438	0.478	0.519	0.560	0.600	0.56	0.2
0.9	0.200	0.182	0.194	0.225	0.265	0.311	0.359	0.408	0.457	0.504	0.550	0.33	0.1
1.0	0.000	0.017	0.056	0.107	0.163	0.222	0.281	0.339	0.395	0.449	0.500	0.00	0.0

The gain can be improved by giving an increased weight to the overlapping part, and reduced weight to the non-overlapping part of the sample. We can do this because each part in itself is a representative sample, and hence is any combination of the parts.

Table 1 shows how the variance varies with R and with different choices of the relative weights given to the two parts. The last column is the weight for minimum variance, and equals (1-R). To add up to 1.0, the actual weights are

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[9] Overlapping part: $1/(2-R)$

[10] Non-overlapping part: $(1-R)/(2-R)$

(Note that these are the additional weights applied at the time of putting together the two parts. The normal sample weights are of course used as usual in producing the estimates for each part.)

Substituting [5] and [6] with the above weights into [3] gives the estimated variance. The next-to-last column is the ratio of this minimum variance to what would be obtained with equal weights (col. A). The gain from reweighting depends on the value of R (which has to be empirically estimated from the survey data). With $R \leq 0.4$, the maximum possible gain from reweighting is no more than 5%. It increases to 10% for $R=0.5$, to 30% for $R=0.7$ and rapidly to the theoretical limit of 100% for $R=1.0$.

3. Annual Aggregation

The eight enumerations providing data for annual estimation can be divided into four pairs (marked 1, 2, 3 and 4 in the diagram above). The first pair consists of two independent subsamples, and its variance is exactly the same as that for a quarterly estimate (which is also based on two independent subsamples, as noted above):

[11] $\text{var}1 = V/2.$

Each of the remaining pairs consists of two overlapping subsamples, and the variance of their aggregation is increased due to the positive correlation between them:

[12] $\text{var}2 = \text{var}3 = \text{var}4 = (1+R)*V/2.$

Putting together these samples with weights $W_h = 0.25$ into [3] gives

[13] $\text{variance, annual level} = (1 + 0.75*R)*V/8.$

With zero correlation (or in the absence of an overlap) between the eight subsamples enumerated during the year, variance in estimating annual levels is obviously

[14] $= V/8.$

Column marked (A) in Table 2 shows how the variance is increased due to overlap, compared to a sample with no overlap (or zero correlation R). The extent of the loss in precision depends on the value of the average correlation R between observations with overlapping samples. With R=0.6 for instance, the 50% quarterly overlap increases the variance by 45%.

Table 2
Variance of the annual aggregate over 4 quarters (relative values)

correlation (R)	relative weight given to overlapping part (non-overlapping part=1.0)										(A) Minimum/ col(A)	Optimal weight	
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9			1.0
0.0	4.000	2.438	1.750	1.407	1.223	1.120	1.061	1.028	1.010	1.002	1.000	1.00	1.00
0.1	4.000	2.445	1.769	1.437	1.263	1.168	1.116	1.089	1.077	1.073	1.075	1.00	0.91
0.2	4.000	2.452	1.788	1.467	1.302	1.216	1.171	1.150	1.143	1.144	1.150	0.99	0.83
0.3	4.000	2.459	1.806	1.497	1.342	1.264	1.227	1.212	1.210	1.215	1.225	0.99	0.77
0.4	4.000	2.466	1.825	1.527	1.382	1.312	1.282	1.273	1.276	1.286	1.300	0.98	0.71
0.5	4.000	2.473	1.844	1.557	1.421	1.360	1.337	1.334	1.343	1.357	1.375	0.97	0.67
0.6	4.000	2.480	1.863	1.587	1.461	1.408	1.392	1.395	1.409	1.428	1.450	0.96	0.63
0.7	4.000	2.488	1.881	1.617	1.501	1.456	1.447	1.456	1.475	1.499	1.525	0.95	0.59
0.8	4.000	2.495	1.900	1.647	1.540	1.504	1.502	1.518	1.542	1.570	1.600	0.94	0.56
0.9	4.000	2.502	1.919	1.676	1.580	1.552	1.557	1.579	1.608	1.641	1.675	0.93	0.53
1.0	4.000	2.509	1.938	1.706	1.620	1.600	1.612	1.640	1.675	1.712	1.750	0.91	0.50

The loss can be reduced by giving an increased weight to the non-overlapping part, and reduced weight to the overlapping part of the sample. Table 2 shows how the variance varies with R and with different choices of the relative weights given to the two parts. The last column is the weight for minimum variance, and equals 1/(1+R) for the overlapping part. To add up to 1.0, the actual weights are

[15] Non-overlapping part: $(1+R)/(4+R)$

[16] each of the 3 overlapping parts: $1/(4+R)$

Substituting [15] and [16] with the above weights into [3] gives the estimated variance. The next-to-last column is the ratio of this minimum variance to what would be obtained with equal weights (col. A). The gain from reweighting is mostly very modest, unlike the previous case of quarterly change. It does not exceed 5% even with R as high as 0.7.

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C. Main Conclusion

In summary, with 50% overlap from one quarter to the next, and $R=0.6$, say, and optimal weighting, the overlapping increases the precision in measuring quarterly change. The variance may be reduced by nearly a factor of 2, making the variance for change similar to that in measuring quarterly levels.

However, the variance of annual estimates is increased by around 40% (see Table 2) compared to the design with no sample overlaps, as at present. This means that the annual sample size would need to be increased by around 40% if the current level of precision is to be retained – i.e. from the present 42,000 households to around 60,000 per year or 15,000 per quarter.

II. MEASUREMENT OF UNEMPLOYMENT IN SAKERNAS

Sakernas is designed to measure the basic LFS concepts of employment, unemployment, under-employment, main activity status if economically inactive, and status in employment. The issue is how far the concepts in the survey are operationalized to conform to the international (ILO) standards¹.

A. Employment

The measurement of employment appears to be according to the international standards. In fact, Sakernas collects some additional information. Firstly, information is obtained on all the main activities performed by the respondent during the preceding week (question 2a). This permits an estimation of the incident of each type of activity, with each person counted more than once if applicable. Then the main activity during the week is identified (question 2b). This permit classification of the population according to main activity, including employment if applicable. Those with employment as the main activity during the past week are of course 'employed' according to the ILO concept. The remaining are also classified as 'ILO employed' if they have done at least one hour of work during the week (question 3), or are temporarily away from work (question 4). This completes the conformity with the international standards.

B. Unemployment

However, the measurement of unemployment in Sakernas needs to be re-examined. At

¹ In an internal report, some doubt was cast on three aspects of Sakernas: it is stated that (i) some computations are in error; (ii) the definition of employment or work does not conform to ILO standards; and (iii) the same applies in particular to the concept of unemployment. I have examined these issues, and find that criticisms (i) and (ii) are not valid. However, the application of the concept of 'unemployment' does require re-examining in Sakernas, as discussed in this section.

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present, those not 'ILO employed' (see above) are classified as unemployed on the basis of a positive answer to a single question:

Q5 'Are you looking for a job?'

There are some other questions in the questionnaire relevant to the status of being unemployed, but those are at present not used for the purpose. These include:

Q16 steps taken in looking for job

Q17 duration since started looking for a job

Q18 type of job looking for

Q19 main reason for not looking

Q20 'If you were offered a job, would you accept it?'

Q21 whether ever worked before.

At least formally, it appears that the measurement of unemployment in the above manner does not conform to the ILO definition, though the actual numerical difference is an empirical question. It is recommended that the standard reference

R. Hussmanns, F. Mehran, and V Verma: *Surveys of Economically Active Population, Employment, Unemployment and Underemployment: An ILO Manual on Concepts and Methods*. Geneva: International Labour Office, 1990.

be consulted in detail to identify the modified sequence of questions which may be introduced to make the survey more consistent with international standards.

Some main points may be noted here.

- Q5, which is the basic question, should be worded so that it clearly covers not only persons looking for paid employment, but also those looking for or making arrangements for starting self-employment.
- The impact of questions already in Sakernas in defining unemployment more in line with the international standards should be investigated empirically from the time series of data already available from the survey. For example, persons not looking for work because they already have a job ('future starts') in Q19 are included as unemployed according to the standard definition. If a 'relaxed' framework is adopted, as is often more appropriate in developing countries, then those not looking because they feel there is no work available ('discouraged workers') in Q19 should also be counted as unemployed.
- By contrast, those taking no active steps (Q16=blank) should be counted as economically inactive rather than unemployed. However, in relation to search for work, usually a longer reference period than simply the preceding week is considered more appropriate.

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- To be classified as unemployed, the person should be 'available for work'. This refers to the person's physical availability to start work during the reference week or some following period such as within the next four weeks. It is not an issue of 'accepting' a particular job. Q20 may therefore need to be reformulated. The availability question is all the more important if a 'relaxed' definition of 'looking for work' is adopted.

C. Status in Employment

Dr. Hananto Sigit in his report on the proposed STPKK survey² has proposed a categorisation of status in employment which is more refined and more appropriate to the Indonesian situation. It should be investigated whether this can be incorporated into Sakernas.

III. PILOT SURVEY TO MONITOR SHORT-TERM EMPLOYMENT AND EARNINGS CHANGES

This section presents some brief and practical remarks on the proposed STPKK survey. The STPKK is planned to be an intensive (focused) but a small-scale survey – initially a very limited pilot. The rationale and overall structure of the survey has been elaborated in a separate report by Dr. Hananto Sigit.³

A. Content

Five points are worth noting:

1. The sample base for the survey has to be limited and focused – both in terms of coverage and sample size. This means that the survey does not aim, nor should it report, on quantitative measures such as activity or unemployment rates. For such 'broad' statistics, we must continue to depend exclusively on regular and large-scale surveys such as Sakernas. Rather, the focus of the survey should be on *monitoring a carefully selected and limited set of indicators of relative change*.
2. The survey should aim at measuring phenomena not captured in the regular surveys. These concern in particular the circumstances in which individual workers are losing or gaining employment in the current economic situation, changes in their wages and/or earnings, changes in their circumstances, special difficulties

² “Survei Triwulanan Pemulihan Kesempatan Kerja: A Proposed Survey to Monitor Short-Term Employment & Earnings Changes”, STAT Project Report # 17, December, 2000.

³ *Ibid.*

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experienced, possibly including some subjective question, etc.

3. One of the new important areas to be included is earnings – in particular *changes* in earnings - from employment as well as self-employment. This would require the development of fairly complex series of questions.
4. The development and testing of the questionnaires is therefore a very important part of the planned pilot.

B. Sampling

With regard to sampling, the following points need to be considered:

1. The above mentioned focus on change does *not* mean longitudinal monitoring of a panel of respondents. In fact, such a design will be too difficult, expensive and time-consuming. Primarily, quick monitoring of changes requires retrospective collection of the information at the individual level, with the survey itself designed as a series of purely cross-sectional enumerations, each of which separately and directly obtains information on recent change at the micro-level.
2. As noted by Dr. Sigit, the domains of study will be 'sub-economies', rather than geographical areas. For cost and practical reasons, the sample will have to be geographically very restricted in any case – based on a carefully selected *small number* of areas as far as possible. Within the sample areas, a targeted sample of households and persons is required – targeted in terms of employment and related characteristics. Nevertheless, the sample must be such that statistically valid conclusions can be reached on its basis.
3. Perhaps the most appropriate approach would be to select the sample on the basis of information on economic characteristics of areas (e.g. wilcah) available from the 1996 Economic Census and/or SUSI. From these sources, areas of concentration of particular 'sub-economies' of interest can be identified. Those with the highest 'concentration' of the 'sub-economies' of interest can be taken into the sample, or more generally, the sample can be selected with probabilities in proportion to the degree of such concentration.
4. As far as possible, complicated subsampling of households or persons within selected areas should be avoided, as should any elaborate screening or listing operations. Such operations are often too difficult, time-consuming and expensive; they also tend to be prone to error. Hence the sample should (and can) be designed so as to minimize the need for screening within sample areas. This can be achieved by making a full use of the census/SUSI information in the *selection of areas* themselves.
5. In any case, the restricted sample base of the survey would mean that external information (such as from the 1996 Economic Census

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and/or SUSI frame) will be required to produce reasonably valid estimates from the survey.

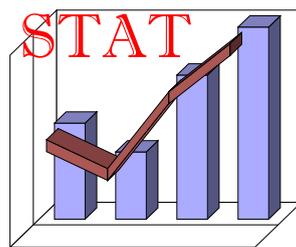
6. Certain 'sub-economies', such as individuals who are working (or have recently worked) in medium and large scale establishments, cannot be adequately captured from an area-based frame of the type mentioned above. It will be desirable to supplement the sample by selecting workers from such enterprises, or possibly from areas where these enterprises are located. The extent of such supplementation depends on the available resource.

AGRICULTURAL CENSUS AND SURVEYS

Report # 23
Statistical Paper # 5

by
Vijay Verma

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I. CURRENT STATISTICS

This report is a follow-up to my earlier report *Surveying Agricultural Households*¹. In this report, some more empirical evidence is examined. This reinforces the main conclusions presented in the earlier report. These are as follows:

1. Area under cultivation (and other current statistics) are collected routinely on a complete coverage basis. Complete coverage and high frequency of reporting on areas and other aspects are burdensome.²
2. In parallel, yields are obtained for paddy and other food crops using the crop-cutting method (with field work shared equally by extension agents and BPS statistical agents). While the sample size has been greatly reduced, from earlier 110,000 crop-cuts annually to around 30,000 in year 2000, this still remains a major and costly operation.
3. It appears certain that this system results in low quality of the data provided. The independence of the two systems for estimating areas and yields is prone to the danger of incompatibility of concepts and coverage, and hence to the danger of systematic biases in estimation of production computed as the product of two independent measures.
4. Some of the fluctuations from one year to the next appear very implausible. These suggest a rather uncontrolled data collection operation, and the presence of large and unstable biases in the results.
5. Comparisons with data on food consumption indicate that over-estimation of production has existed for a long time. It is believed that this results from over-estimation both in cultivated areas and in yields.

Table 1 presents some empirical information supporting the above statements. The table summarizes the reported change in cultivated area, yield and production between 1997 and 1998, as published by BPS. The figures are at the national level, based on complete coverage (in the

¹ STAT Project Report # 4, June, 2000.

² See Appendix A below for an outline of the current methodology

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case of areas) or very large samples (in the case of yield), and hence are practically unaffected by sampling error. At the same time, it appears very unlikely that such large changes in a single year could be real. Also, the pattern seems to lack consistency: whether we look across Java and Outer Islands, or across different crops.

For instance in Java, paddy and peanuts indicate a moderately large increase in the cultivated area between 1997-98, but an almost equally large reduction in yield, so that the recorded change in production is relatively small. Such a 'balance' is not expected.

By contrast, maize, mungbeans and sweet potatoes in Java all record very large (implausible?) increases in the area cultivated, nearly constant yields, and hence also very large increases in the total production. In Outer Islands, this pattern appears only for mungbeans.

Table 1
Percentage Change Recorded Between 1997 and 1998 in Area, Yield and Production

	Java			Outside Java			Indonesia		
	area	yield	production	area	yield	production	area	yield	production
paddy	6.90	-6.99	-0.58	3.80	-3.56	0.10	5.29	-5.30	-0.28
maize	26.85	-0.18	26.62	1.44	1.35	2.79	14.68	1.11	15.95
soybeans	-3.64	-1.66	-5.24	0.30	-1.41	-1.12	-2.15	-1.73	-3.78
peanuts	5.70	-4.18	1.26	0.07	-0.74	-0.61	3.65	-3.01	0.58
mungbeans	12.40	0.67	13.22	18.52	2.27	21.19	15.31	1.35	16.96
cassava	-5.28	0.00	-4.90	-0.31	0.92	0.10	-3.06	0.00	-2.89
sweet potatoes	17.84	-0.92	17.14	-4.55	1.16	-3.89	3.41	1.05	4.74

Recommendations:

1. It is highly desirable to examine the consistency and plausibility of the data from the survey. This should be done *at the level of the greatest possible disaggregation*: by year, quarter, even by month where possible, for the long time series of the information which has been collected; and also by province, kabupaten, and even by individual kecamatan where possible. If changes as large as those in Table 1 can appear for the whole country, it is highly likely that some entirely implausible levels of change are present in the data when disaggregated to smaller units of time and space. 'Plausibility rules' should be established to edit and correct implausible data points.
2. With kecamatan if possible (at least kabupaten otherwise) as the unit, and by major crop, BPS should study the mean values and standard deviation of the basic variables: (i) reported yield; (ii) cultivated area/agricultural population in the unit; and (iii) production/agricultural population in the unit. (The denominators for (ii) and (iii) may be estimated from census and population

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projections, and from extrapolations of the information on the proportions in agriculture as required.) Such information is useful not only for evaluating the data, but also for sample design.

II. PILOT STUDY USING THE HOUSEHOLD APPROACH

A very large scale pilot study for the measurement of agricultural areas, production, yields and other variables was conducted in Java during 1996-97. The sample covered 6,000 wilcah, and as many as 262,000 households in Java. The results have been analysed and published by BPS in detail.

The system differs as follows from the current methodology:

Source	Measured	Computed
Current statistics	Area (A) 'eye estimates'; Yield (Y) 'crop cuts'	Production $P = A*Y$
Household approach	Area (A); Production (P) both from 'farmers reports'	Yield $Y = P/A$

A. Comparison with Current Statistics

Table 2 shows the level of difference from the current statistics approach, by 4-monthly periods and by province. Compared to the household approach, the current method 'over-estimates' cultivated areas by 20%, yields by over 25%, and hence production by over 50%. (Of course, alternatively this may be seen as 'under-estimates' from the household approach, compared to the current methodology, by 17% in area, 21% in yield and 35% in production. The truth may well lie in-between the two. Still, as to which approach is *more correct* needs to be established by a careful evaluation of the results.)

Note in particular the *above average* discrepancies for the January-April and the Jawa Timur area data, and for both the area and yield data for DI Yogyakarta. One source of the difference can be under-coverage of the sampling frame with the household-based approach. This would result in under-estimation of area (and production), but is unlikely to be an explanation for the big difference between the two sources in the yield values.

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Table 2
Result of Pilot: Comparison of Existing System with Household Survey Approach (Paddy)

	(H) household survey			(M) MOA+cropcut			'over-estimate' (M-H)/H %		
	area	yield	production	area	yield	production	area	yield	production
jan-apr	1,984	50.1	99,458	2,690	63.3	170,274	<u>35.6</u>	26.3	71.2
may-aug	1,592	47.5	75,538	1,744	59.3	103,490	9.6	25.0	37.0
sep-dec	703	47.3	33,294	726	60.5	43,902	3.2	27.8	31.9
Jawa Barat	1,705	49.0	83,551	1,963	60.7	119,198	15.1	23.9	42.7
Jawa Tengah	1,290	47.9	61,738	1,551	61.3	95,029	20.2	28.0	53.9
DI Yo gyakarta	79	46.5	3,666	102	64.5	6,597	<u>29.7</u>	<u>38.7</u>	79.9
Jawa Timur	1,205	49.3	59,342	1,543	62.9	97,017	<u>28.1</u>	27.6	63.5
total	4,279	48.7	208,315	5,160	61.6	317,947	20.6	26.6	52.6

Recommendations:

These are very large differences.

1. Firstly, it should be investigated whether the two systems are measuring the same things. For instance, are different types of land use – agricultural area, cultivated area, harvested area, etc. - being correctly distinguished? Also, is production by different end use – total production, own consumption, given as wages, animal feed, wastage, marketed, etc. - being correctly and consistently distinguished in the two systems?
2. In any case, in the collection of the data in either of the systems, separate reporting should be sought distinguishing area by land-use and production by end-use, so that the final variables can be constructed without confusion.
3. As for the current statistics noted in the previous section, it is highly desirable to examine the consistency and plausibility of the comparative data from the two sources *at the level of the greatest possible disaggregation*: at least by 4-month period classified by province, and by individual kabupaten where possible. If differences as large as those in Table 2 can appear for the whole country, it is highly likely that some very extreme (hence highly implausible) differences are present in the data when disaggregated. *Comparing in detail these differences at the disaggregated level with the detailed time-series of comparisons from Recommendation 1 above may often provide a clear indication as to which source is likely to be more in error.*

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B. Analysis of Variation

The study of mean values and standard deviation by kabupaten, both with the household and wilcah as the units of analysis, is useful for evaluating the data as well as for sample design. Such study should be done for all the basic variables by major crop.

With the household as the unit, this should include: (i) reported cultivated area; (ii) reported production; and (iii) computed yield. With wilcah as the unit of analysis, this should include: (i) reported cultivated area per agricultural household in the wilcah; (ii) reported production per agricultural household in the wilcah; and (iii) mean yield ('combined ratio' of the above two figures). Also would be useful for sample design purposes information on (iv) number of agricultural households in the wilcah, and (v) number of households in the sample from the wilcah.

The BPS have provided some information on mean values and variation of *yields* analysed in Tables 3 A-C. Table 3A shows the mean, standard deviation and their ratio (coefficient of variation) of paddy yield with the household as the unit. (The data have been provided by BPS by province and kabupaten, but in the tables here, breakdown by kabupaten has been shown only for one of the provinces.) The computed yields by household are quite variable (average cv=40%) – despite the claim sometimes made that there is little variation in these values. (In 60% of individual kabupaten in the province, estimated cv is in the range 30-45%.)

Table 3B shows the same computations performed with wilcah as the unit of analysis, i.e. it shows standard deviation and cv's for wilcah means³. The average cv among these values is surprisingly large, at over 25%.

Table 3C uses this information to estimate the design effects to which the sample for the Pilot is subject. Assuming that we are dealing with a simple random sample of wilcah, with a random sample of households within each sample wilcah, we have:

$$deft^2 = \left(\frac{S_w^2}{S_k^2/\bar{b}} \right) = 1 + roh * (\bar{b} - 1)$$

Here $deft^2$ is the factor by which variance is inflated due to the use of a two-stage sampling design (wilcah, followed by households), and roh is the corresponding intra-cluster correlation coefficient, with \bar{b} as the average number of sample households per wilcah. S_h is the standard

³ The mean values in Tables 3A and 3B differ somewhat because the latter presumably gives the simple mean on wilcah means in the kabupaten, while the former is the true per household mean.

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deviation of household yields, and S_w that of wilcah means⁴.

If wilcah were merely random groupings of households, we would expect:

$$S_w^2 = S_h^2 / \bar{b},$$

but S_w exceeds this value because of the positive correlation between households in the same wilcah.⁵

Table 3C shows extremely large values of design effect, with $\text{deft}^2 > 25$ (representing the factor by which the effective sample size has been reduced compared to a SRS of households), or $\text{deft} > 5$ (representing the factor by which standard error has been inflated). This is the result of *very large cluster sizes* (65 sample households per wilcah), and also of the *very high degree of homogeneity* among households within the same wilcah (average $\text{roh} = 0.4$).

Recommendations

These results have serious implications for the design of a household-based approach:

1. If such high values of roh are real, then this implies that *much smaller clusters* (i.e., numbers of sample households per wilcah) should be used. With $\text{roh} = 0.4$, and for example 6 sample households per wilcah, we will have $\text{deft}^2 = 1 + 0.4 \cdot (6-1) = 3.0$, or $\text{deft} = 1.7$.
2. However, it is also possible (indeed likely) that these large roh values are caused in part by some problems with the data. How are the enumerators reporting area and yield values such that they result in so uniform yield values within wilcahs? It is necessary for BPS to investigate data at the micro-level, and also by individual enumerator.
3. The above points apply to variance of yield values. It is also necessary to analyse those for areas and production figures before final conclusions about the sample design can be drawn.

⁴ In the actual computations in Table 3C, I have used the cv's rather than the standard deviation (S) values, because the latter are affected by the slight differences in the mean values as a result of the manner in which these means have been computed. (See previous footnote.)

⁵ The BPS (unpublished) data provided to me also include an additional column in each of the tables A and B. This is labelled as 'standard error of the mean', and computed as the ratio [3]/[1] in Table A and as [7]/[5] in table B. While the latter is essentially correct as the actual standard error of mean yield, the former is not: it is what the standard error would have been with a simple random sample of households, i.e. with $\text{deft} = 1.0$.

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Table 3
Variation of Yield (pilot survey - household approach)

3A. Yield by household					
province		[1]	[2]	[3]	[4]
	kabupaten	Households	mean	StDev	cv(%)
32	1	2,675	.472	0.209	44.2
	2	3,048	0.359	0.180	50.2
	3	3,987	0.436	0.171	39.2
	4	6,357	0.458	0.159	34.8
	5	5,431	0.480	0.135	28.2
	6	4,915	0.445	0.133	29.9
	7	5,353	0.455	0.193	42.5
	8	6,157	0.421	0.152	36.2
	9	6,900	0.438	0.152	34.8
	10	2,704	0.445	0.143	32.2
	11	1,837	0.495	0.145	29.3
	12	3,571	0.481	0.177	36.8
	13	3,397	0.445	0.123	27.6
	14	3,882	0.458	0.159	34.7
	15	3,830	0.475	0.156	32.8
	16	1,428	0.400	0.168	42.0
	17	2,901	0.549	0.128	23.4
	18	1,863	0.500	0.226	45.1
	19	2,013	0.414	0.221	53.4
	20	2,814	0.484	0.227	46.9
	71	5	0.452	0.268	59.2
	72	38	0.561	0.224	40.0
	73	154	0.491	0.180	36.6
	74	1	0.350		
	75	56	0.791	0.508	64.3
32 total		75,317	0.454	0.170	37.4
33 total		77,497	0.462	0.186	40.3
34 total		18,468	0.445	0.185	41.5
35 total		75,696	0.471	0.203	43.1
grand total		246,978	0.461	0.186	40.4

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Table 3 (cont.)						
Variation of yield (pilot survey - household approach)						
3B. Yield averaged over wilcah						
province		[5]	[6]	[7]	[8]	
	kabupaten	no. of wilcah	mean	StDev	cv(%)	
32	1	32	0.468	0.099	21.2	
	2	45	0.358	0.124	34.7	
	3	62	0.458	0.112	24.4	
	4	101	0.474	0.083	17.5	
	5	91	0.500	0.091	18.1	
	6	75	0.439	0.082	18.6	
	7	78	0.453	0.113	24.9	
	8	89	0.434	0.078	17.9	
	9	105	0.444	0.078	17.6	
	10	40	0.443	0.074	16.8	
	11	32	0.505	0.110	21.8	
	12	51	0.482	0.065	13.4	
	13	50	0.443	0.051	11.5	
	14	63	0.459	0.092	20.1	
	15	67	0.478	0.108	22.5	
	16	23	0.413	0.054	13.2	
	17	43	0.535	0.066	12.4	
	18	33	0.496	0.087	17.5	
	19	30	0.492	0.100	20.3	
	20	47	0.457	0.125	27.4	
	71	2	0.530	0.042	8.0	
	72	3	0.603	0.060	10.0	
	73	8	0.429	0.091	21.3	
	74	1	0.350	0.000		
	75	3	0.593	0.527		
32 total		1,174	0.461	0.099	21.5	
33 total		1,135	0.463	0.120	25.9	
34 total		254	0.487	0.188	38.6	
35 total		1,254	0.464	0.128	27.7	
grand total		3,817	0.464	0.121	26,0	

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Table 3 (cont). Variation of yield (pilot survey - household approach)					
3C Design effects					
province	kabupaten	hhs/wilcah [9]= [1]/[5]	deft2 [10]= [9]*{[8]/[4]}^2	roh [11]= {[10]-1}/{[9]-1}	
	32	1	84	19.2	0.22
		2	68	32.5	0.47
		3	64	24.9	0.38
		4	63	15.9	0.24
		5	60	24.6	0.40
		6	66	25.4	0.38
		7	69	23.6	0.33
		8	69	16.9	0.23
		9	66	16.8	0.24
		10	68	18.5	0.26
		11	57	31.6	0.54
		12	70	9.3	0.12
		13	68	11.8	0.16
		14	62	20.7	0.32
		15	57	27.0	0.46
		16	62	6.1	0.08
		17	67	18.9	0.27
		18	56	8.5	0.13
		19	67	9.7	0.13
		20	60	20.5	0.33
		71	3		
		72	13	0.8	-0.02
		73	19	6.5	0.30
		74	1		
		75	19		
	32 total		64	21.3	0.32
	33 total		68	28.1	0.40
	34 total		73	62.9	0.86
	35 total		60	24.9	0.40
	grand total		65	26.9	0.41

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III. PROPOSAL: A SURVEY OF FARMING HOUSEHOLDS

As recommended in a previous report⁶, the proposal for consideration is to *supplement the existing system by a regular agricultural survey at the household level*. The survey will aim at overcoming the shortcomings of the current system. The already reduced crop-cut sample will perhaps release some resources for that purpose.

The pilot surveys already conducted should be analyzed further. It may be appropriate to begin with a limited geographical coverage before expanding the new approach to the national level.

One further advantage of a household based approach is that information on production and yields can be related to a host of other policy relevant variables, such as on farming practices, use of machinery, etc., and also to personal characteristics of individual farmers and agricultural households.

IV. AGRICULTURAL CENSUS

The planning and design of the next Census of Agriculture is a major and complex operation, and its many details are not considered in this report. Two main recommendations are made here.

Recommendations

1. The Census of Agriculture should be based on a large sample drawn from the last Population Census.
2. The household listing operation within the sample wilcah for the Census of Agriculture must be greatly simplified. This is because this is a large-scale operation which has to cover all households in sample wilcah. The collection of detailed information should be confined to the *sample* of 'potentially' agricultural households finally included in the Census of Agriculture.

The first recommendation has been briefly discussed in my earlier report *Area Sampling for Economic and Agricultural Censuses based on Population Census 2000*.⁷ Of course, BPS needs to give much more detailed and careful consideration to the issues.

⁶ *Surveying Agricultural Households, Ibid.*

⁷ STAT Project Report # 2, June 2000

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The second recommendation has the following background. Hitherto, the Census of Agriculture has involved three main enumerations:

- (1) an operation to list households in selected wilcah;
- (2) collection of quite detailed information for each household on whether it is eligible for the Census of Agriculture, and for which of the many questionnaires;
- (3) application of the particular questionnaire to each eligible household, covering a separate sample for each application (sector).

This system is costly and complicated. The proposed alternative is to *eliminate* step (2), but to include in step (1) one or more simple questions to identify whether the household is 'potentially' an agricultural household; and to relegate the collection of detailed information to the selected sample in step (3). The elaborate FAO criteria for the inclusion of individual households into the Census of Agriculture can be based on the information collected during step (3), and refined at the *analysis stage*.

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APPENDIX A

BRIEF NOTE ON CURRENT AGRICULTURAL STATISTICS METHODOLOGY

Cultivated Area

Current statistics on agriculture are collected as follows. From each Kecamatan agricultural extension agents (Mantri Tani) report (a) every month on area under paddy and other food crops, on vegetable production, and on area of damage by pests or calamity; (b) every quarter on fruit production; and (c) annually on area by land utilisation and use of agricultural machinery. This information is obtained on a complete census basis. The results are published annually by the BPS, separately by month, quarter, 4-monthly round or yearly as determined by the frequency of collection.

Yield

In parallel, yields are obtained for paddy and other food crops using the crop-cutting method. For paddy, sweet potatoes, peanuts and soybeans, crop-cuts over a random sample of 2.5 by 2.5 m subplots are used; for maize and cassava, the “row-subplot” variant (harvesting a specified length of plant row and measuring average distance between rows) is used. Field work is shared equally by extension agents and BPS statistical agents. The sample size has been large in the past - around 110,000 crop-cuts annually, each cut representing around 120 ha of cultivated land in the country – but reduced to 30,000 crop-cuts in year 2000 due to budgetary reasons. Field work is shared equally by extension agents and BPS statistical agents.

Production

Total production is estimated by multiplying yields and harvested areas estimated from the two independent systems.

Reporting Domains

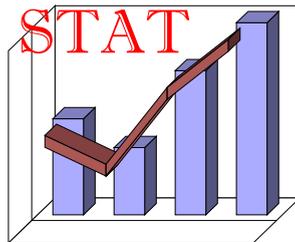
For each category of production, the country is divided into two domains: (a) “potential areas” which cumulatively account for 90% or more of the total production in the category, and (b) the remainder, “non-potential areas”. In (a) data are reported disaggregated to the Kabupaten level, and in (b) to the provincial level. It is clear that both in time and space the level of disaggregation presented is very detailed.

MONTHLY MANUFACTURING PRODUCTION AND EMPLOYMENT INDICES

Report # 30
Statistical Paper # 6

by
Yahya Jammal
Vijay Verma

April, 2001



Statistical Assistance to the Government of Indonesia (STAT) Project
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I. INTRODUCTION

Since 1986, BPS has conducted a quarterly survey of medium & large manufacturing establishments for the purpose of computing quarterly non-oil manufacturing GDP. In the early 1990s it introduced a quarterly system which obtained monthly data from establishments to allow computation of quarterly changes in production. Monthly data on total employment were also collected but were used only for checking reporting error or the plausibility of production data. In 2000, and in support of Indonesia's compliance with the International Monetary Fund's Special Data Dissemination Standards (SDDS), BPS introduced a new quarterly *system* with a monthly *sub-system* aimed at producing an aggregate monthly index for medium and large manufacturing establishments, with a preliminary figure six weeks after the end of the reference month. This system continued to collect monthly employment data as was done in the previous years.

In the past few months, following users' enquiry as to the usefulness of employment data collected in the quarterly survey, BPS began evaluating data for both production and employment to determine whether it is advisable to release employment data in addition to the current practice of releasing production data. This report documents some of the steps undertaken in the evaluation, indicates that the data would be very helpful to industrial and employment policy makers and recommends that BPS's future releases include not only production but also employment indices.

II. QUARTERLY/MONTHLY MANUFACTURING SURVEY

A. Background

1. Objective

The quarterly *system* of manufacturing production indices, which BPS started implementing in the first quarter of 2000, has two inter-related components:

- a. The first is a *quarterly* manufacturing production index based on a sample of 992 establishments. To provide adequate representation for economic policy makers as well as for national accounts estimation, the sample was designed to be representative by 3-digit ISIC.
- b. The second component is a *monthly* manufacturing production index based on a sub-sample of 195 establishments taken from the above *quarterly* sample. The main purpose of this activity was to comply with the IMF's SDDS, namely to provide a timely index for aggregate manufacturing production. That is why the sample was designed to be representative by 1-digit ISIC only.

The sampling frame used was the 1996 Annual Manufacturing Survey, which was the latest available at the time of sample selection in the third quarter of 1999.

2. Questionnaire

The monthly sub-system uses a shuttle form to speed processing and enhance consistency of reporting, which allows computation of monthly indices for a full calendar year (Figure 2). The same form is expected to “shuttle” back and forth between BPS and the establishment by way of fax or email. The quarterly sub-system uses a different form every quarter (Figure 3) which requires data for the three months of the relevant quarter in addition to data for the last month of the previous quarter.

Figure 2
Sample Questionnaire for the Monthly Sub-system

PRODUCTION AND TOTAL EMPLOYMENT PER MONTH									
No	Type of Product	Description	Unit	1999	2000				
				December	January	February	.....	November	December
(1)	(2)	(3)	(4)	(5)	(6)	(7)	.....	(16)	(17)
1.		Quantity							
		Value	million Rp						
		Price/Unit							
2.		Quantity							
		Value	million Rp						
		Price/Unit							
.....									
.....									
6.		Quantity							
		Value	million Rp						
		Price/Unit							
7.	Other*)	Value	million Rp						
8.	Tot. quantity								
9.	Tot. value	Value	million Rp						
10.	Employees	Person							

*) If the value of production of several commodities is less than 2% of the total value of production, please classify these under “Other” (No. 7).

Figure 3
Sample Questionnaire for the Quarterly Sub-system

PRODUCTION AND TOTAL EMPLOYMENT PER MONTH							
No	Type of Product	Description	Unit	1999	2000		
				December	January	February	March
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.		Quantity					
		Value	million Rp				
		Price/Unit					
2.		Quantity					
		Value	million Rp				
		Price/Unit					
.....							
.....							
6.		Quantity					
		Value	million Rp				
		Price/Unit					
7.	Other ^{*)}	Value	million Rp				
8.	Tot. quantity						
9.	Tot. value	Value	million Rp				
10.	Employees	Person					

*) If the value of production of several commodities is less than 2% of the total value of production, please classify these under "Other" (No. 7).

A. Methodology

Establishments in the quarterly system were designed to be representative of particular ISICs. The value of output produced was used as the measure of size for the purpose of sample selection. Sampling weights were then assigned equal to the inverse of the probability of selection. Thus the contribution of establishment j in ISIC i to the total estimate is:

$$Y_{ij} = W_{ij} y_{ij}$$

where W_{ij} is the sampling weight of the establishment and

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y_{ij} the measure of interest, whether output or employment.

Summing the Y_{ij} values over the sample cases gives an estimate of the total Y for the population.

Establishments were selected with probability proportional to the size of output (as measured in the latest frame available at the time of selection) so as to optimize the design for the estimation of current value of output. Estimates of employment may therefore be subject to somewhat larger sampling error than would have been the case in a design with establishments selected with probability proportional to the size of (past) employment.

Computation of the monthly production index for a particular ISIC is done in three steps:

- a. Commodity (quantity) growth factors are computed for every establishment
- b. An establishment (quantity) index is then calculated, aggregating commodity growth factors by using their relative value shares.
- c. An ISIC index is then calculated by aggregating establishment indices using relative value shares (to represent the commodity contribution) and the sampling weight (to reflect the establishment's representation in the sample).

The same procedure is followed for computing ISIC unit value indices. For computing ISIC-level employment indices, only two steps are needed since only one figure exists per month per establishment:

- a. An establishment employment index is calculated for the two relevant months.
- b. An ISIC index is then calculated by aggregating establishment indices using their relevant sampling weights.

Aggregation into higher categories of ISIC (i.e. 2- and 1-digit) follows the same aggregation logic above. That is, for production (and unit value) indices, aggregation is done by applying relative value shares while for employment it is simply by summing up estimated employment over the relevant ISIC.

B. Necessary Adjustments

1. Benchmarking

The survey tracks growth of the fixed panel of establishments in the sample. Deaths are treated as if they were non-respondents, since true deaths cannot be confirmed before

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a relatively long lag. New births since the year of the frame are not represented. Therefore, if the survey results are to adequately reflect current growth in the sector, the contribution of *net births* since the date of the frame needs to be incorporated. One methodology which allows such an adjustment is *benchmarking*.

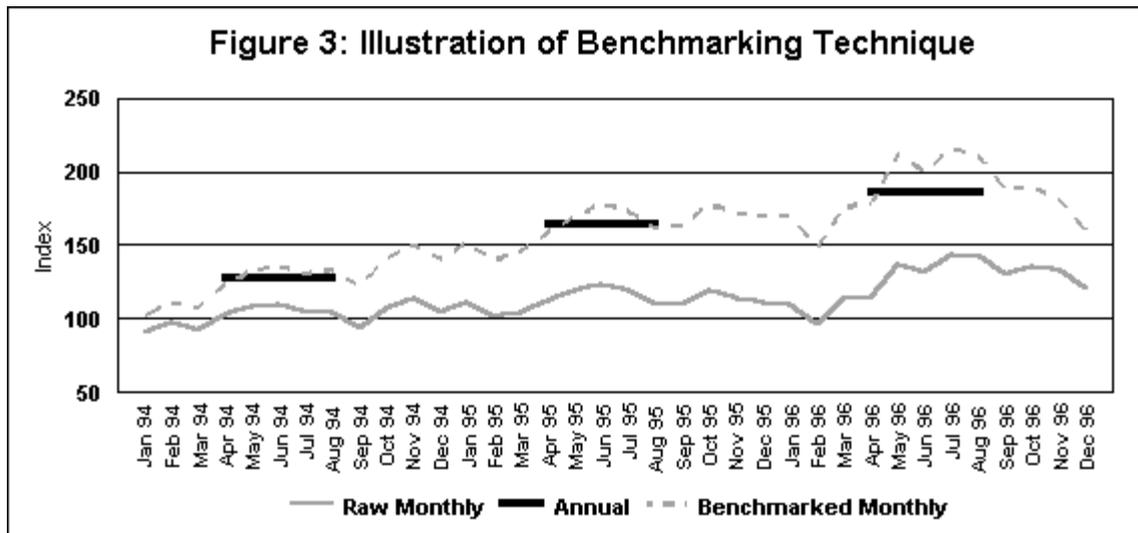
Benchmarking is a technique of combining data pertaining to the same variable from two sources of different frequencies: one, which is more frequent (e.g. the monthly/quarterly survey) is believed to be less accurate (because of its exclusion of new births), and the other, which is less frequent (e.g. the annual manufacturing survey) is believed to be more complete and therefore more reliable in providing an accurate level or *benchmark*. Stated very briefly, what benchmarking does is to use the *levels* from the more reliable annual series and apply to them the monthly/quarterly *fluctuations* from the monthly/quarterly series. The primary aim of any technique used for benchmarking is to distribute the difference between the two series in such a way that the trend in the final series is as close as possible to that of the original series. A well-known benchmarking technique is the proportional Denton method which preserves to a maximum degree the short-term movements in the monthly/quarterly source data, i.e. it keeps the benchmarked series as proportional as possible to the original source data. This is done by minimizing the differences (in a least squares sense) in the month-to-month (or quarter-to-quarter) percentage changes in the original benchmarked series. This method is automated as a particular case of a program called BENCH developed and used by Statistics Canada.¹

Figure 4 provides an illustration of what the benchmarking technique does. A monthly index series (referred to as “raw monthly”) is derived for 1994-1996 from the quarterly system. The average annual levels of the index derived from the more complete annual survey are shown for every year and referred to as “annual”. In other words, if the monthly index had taken into account the effect of net births since the date of selection of the sample, its average would have been the same as that depicted by that of the “annual”, assuming, of course, no inconsistencies in response between the annual and quarterly surveys. Finally, the adjusted monthly series (referred to as “benchmarking monthly”) shows the new levels of the monthly index which average exactly the “annual” level and which show month-to-month fluctuations consistent with the original monthly series.

¹ Cholette, Pierre A, “Users’s Manual of Programme Bench,” Time Series Research and Analysis Division, Statistics Canada, August 26, 1994. John Kuiper provided the DOS-based version of the program and was kind enough to produce the results included in this report and to write a practical summary guide for using that program (“Application of Program BENCH to Selected BPS Statistics,” forthcoming report).

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2. Deflation

Benchmarking, as described in the previous section, was applied to two variables: production and employment. Annual levels obtained from the annual survey were indexed (with 1993 as a numeraire) and used as the “benchmarks” for the monthly indices derived from the quarterly system. While employment levels can be directly compared between the annual and quarterly surveys, since they both measure the same variable (namely, the number of persons employed), production levels cannot. The quarterly survey measures changes in “real” production (i.e. quantities of commodities produced) while the annual survey only measures the current value of production.² These *nominal* values need to be deflated to reflect *real* production. Two types of deflator were used:

- the first was the implicit national accounts deflator used for non-oil manufacturing and published by BPS.³ This deflator, which was applied at the 2-digit ISIC level, is based on the Wholesale Price Index (WPI) and applies to establishments of all sizes (large, medium, small and cottage).

² Prior to the 1998 Annual Survey, although both quantities and values of commodities produced by the establishment were included in the questionnaire, only the total value of production of the establishment was coded and used in processing establishment-level, and therefore ISIC-level, data. Commodity-level data were subject to separate manual processing and were published by commodity or commodity groups (in Volume III of “Survei Industri”). Starting with the 1998 Annual Survey, quantities and values of individual commodities were coded, making it possible to compute unit value indices for establishments.

³ In the national accounts, output at current prices is computed at the 3-digit ISIC level by applying the relevant WPI to the estimated output at constant (1993) prices. Values are then summed up to their corresponding 2-digit ISIC level.

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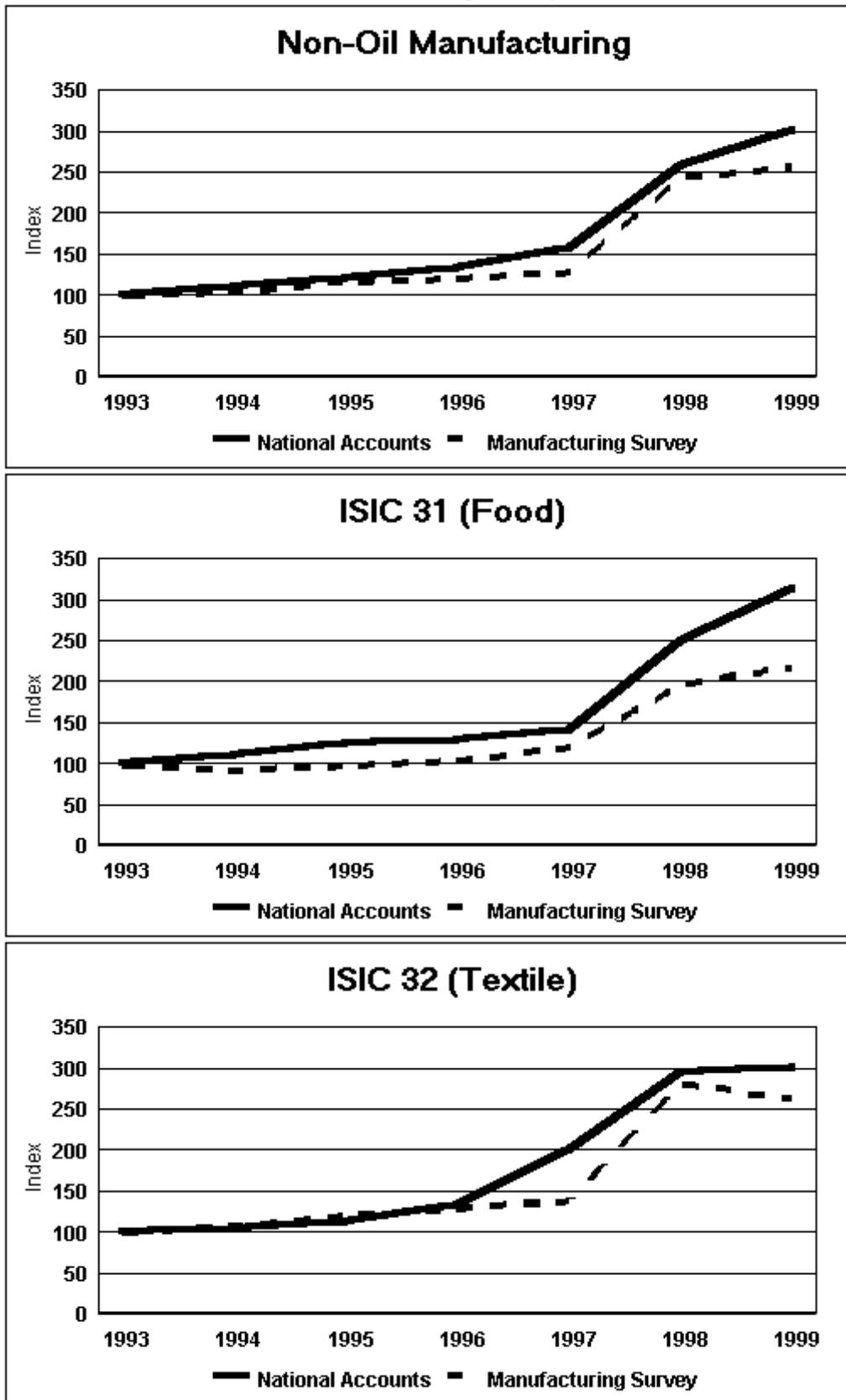
- the second is the unit value index produced by the quarterly survey.

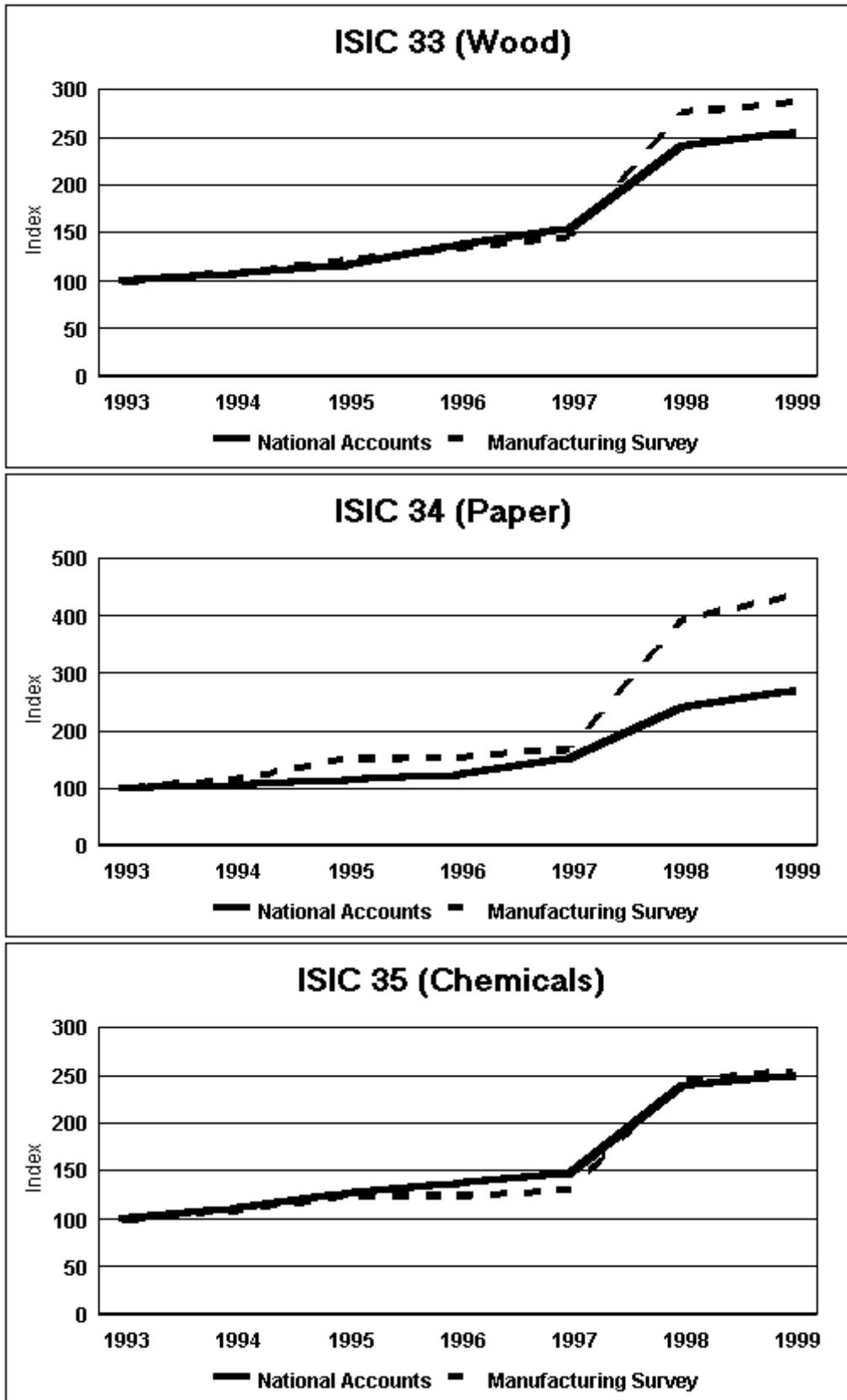
For deflating nominal value of production of medium and large establishments in the annual survey, the quarterly survey index should be preferable for at least two reasons:

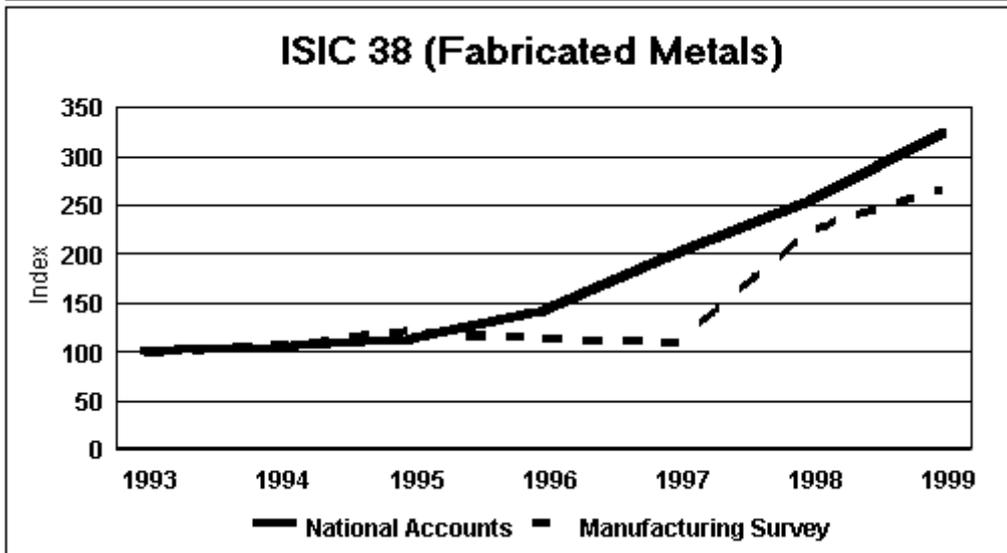
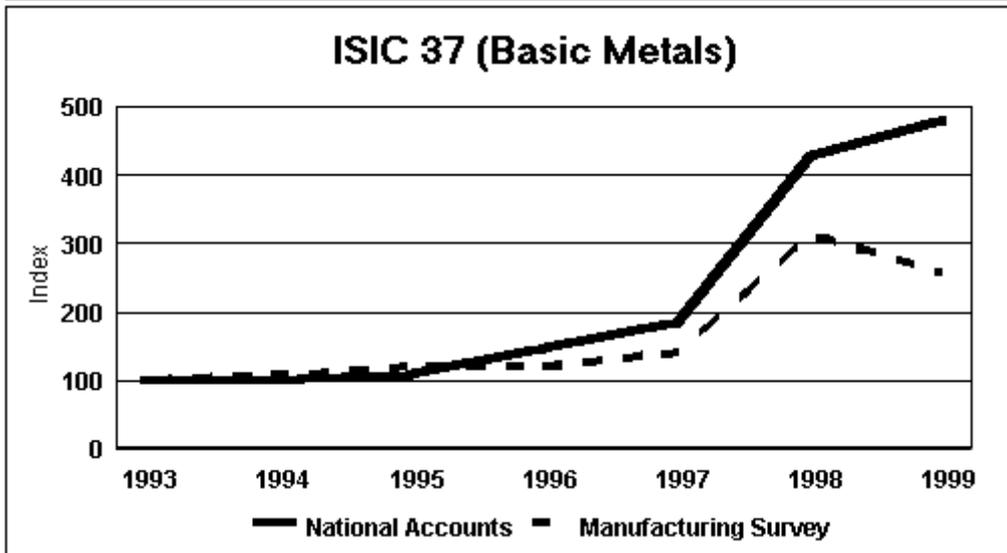
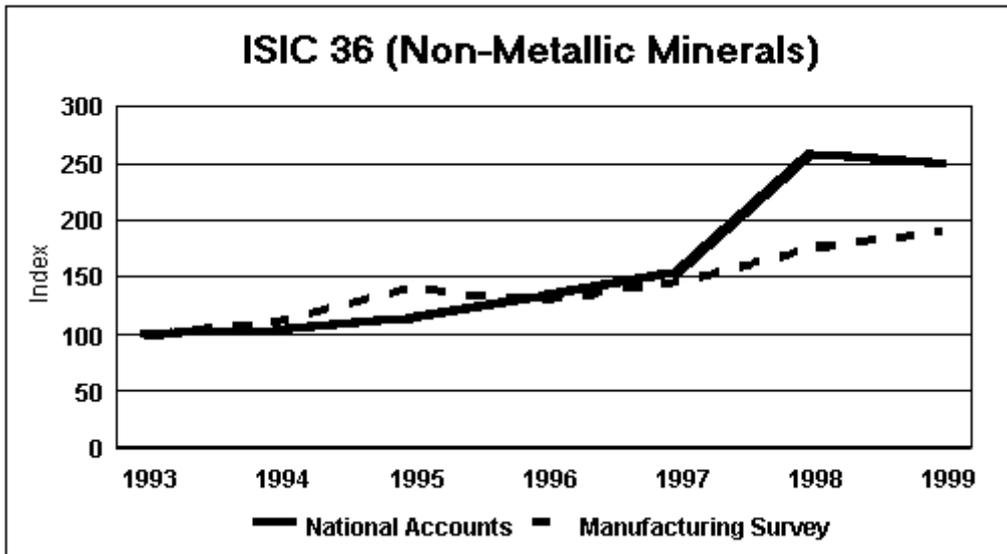
- it covers far more commodities than the WPI. While the latest WPI covers 327 commodities (based on a fixed basket derived in some past base year), the quarterly survey index covers thousands of commodities. More importantly, it covers commodities currently produced by establishments, whereas the WPI may or may not do so (depending on whether these commodities were part of the fixed basket).
- it relies on exactly the same data reported by establishments and used in computing the quantity index.

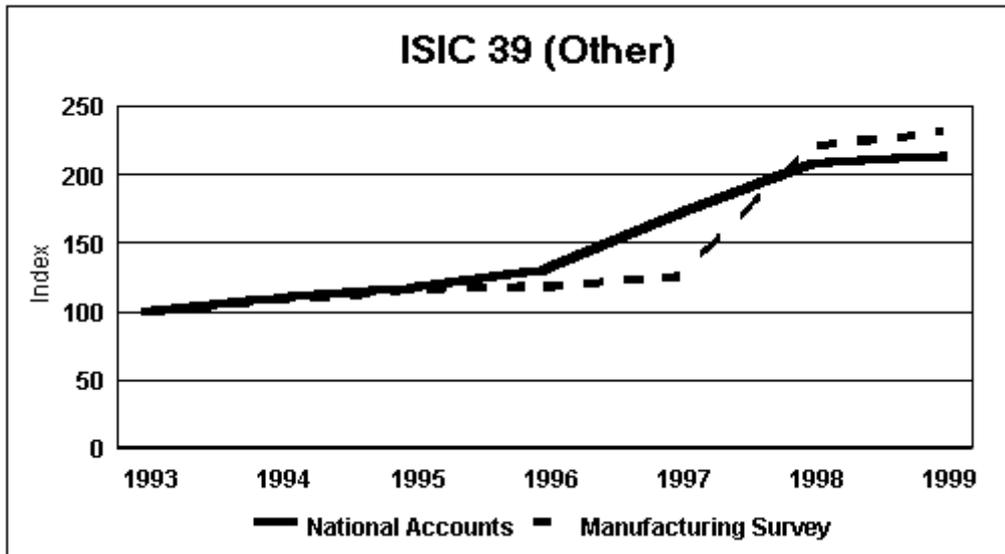
As Figure 5 shows, the stories told by the two indices vary substantially since 1997. For the whole non-oil manufacturing sector, the quarterly survey index (referred to in the graphs as “manufacturing survey”) shows a slower growth through 1997 than the national accounts deflator, a sharper growth in 1998 and a much slower growth in 1999. Some 2-digit ISICs behaved in the same manner (31, 32, 37, 38) while others behaved differently. The main conclusion to be drawn here is that the choice of deflator used in producing the benchmark is likely to have an important impact on the final results.

Figure 5
National Accounts vs Manufacturing Survey Deflators (1993=100)









C. Results

Producing monthly indices and benchmarking them to the annual survey series is certainly feasible operationally, but will it produce plausible results? While one can never be sure how plausible future results will be, one can certainly test the methodology by applying it to past data. If application of a particular methodology to past data produced plausible results, one can increase the level of confidence in the likelihood that it would also produce plausible results in the future, assuming of course that general conditions which applied in the past are likely to apply in the future.

Thus we applied the above methodology to monthly data derived from the 1993-1999 quarterly survey series and benchmarked them using the corresponding annual survey results. The results can be divided into two sections: one devoted solely to aggregate production (which is compared to data from another reliable source, electricity sales to industry by PLN), and the other allowing more disaggregated series of production and employment by 2-digit ISIC. Results are provided here only in graphic form because as of the date of this report they had not yet been finalized and published by BPS.

1. Aggregate Production

Figures 5 and 6 compare monthly electricity consumption by the industry sector with the benchmarked monthly production series using the manufacturing survey deflator and the national accounts deflator respectively.

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Figure 5: Monthly Index PLN vs Monthly Manufacturing Survey (Using Manufacturing Survey Deflator)

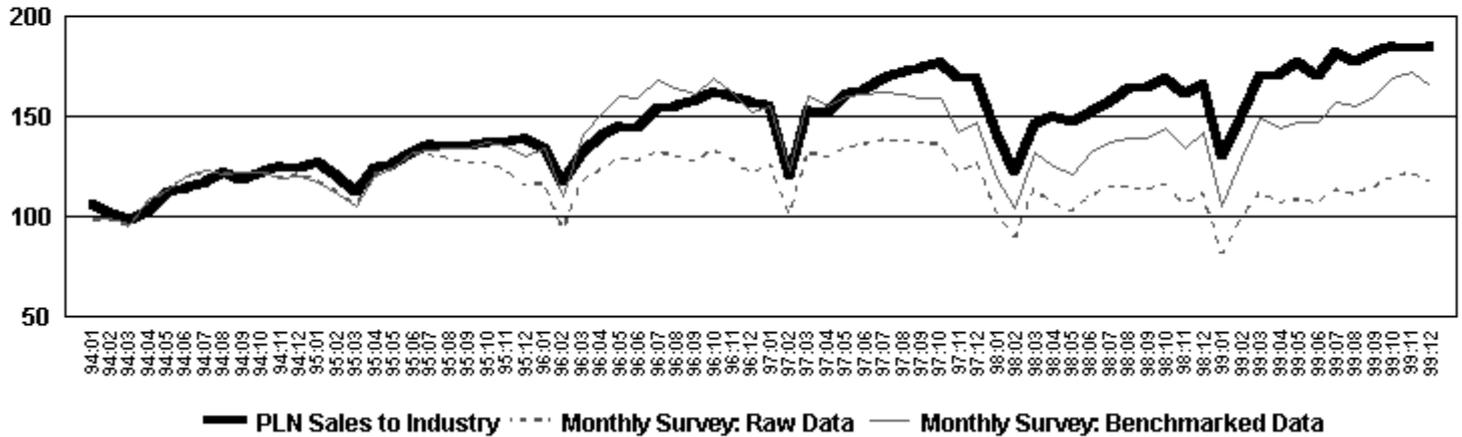


Figure 6: Monthly Index PLN vs Monthly Manufacturing Survey (Using National Accounts Deflator)

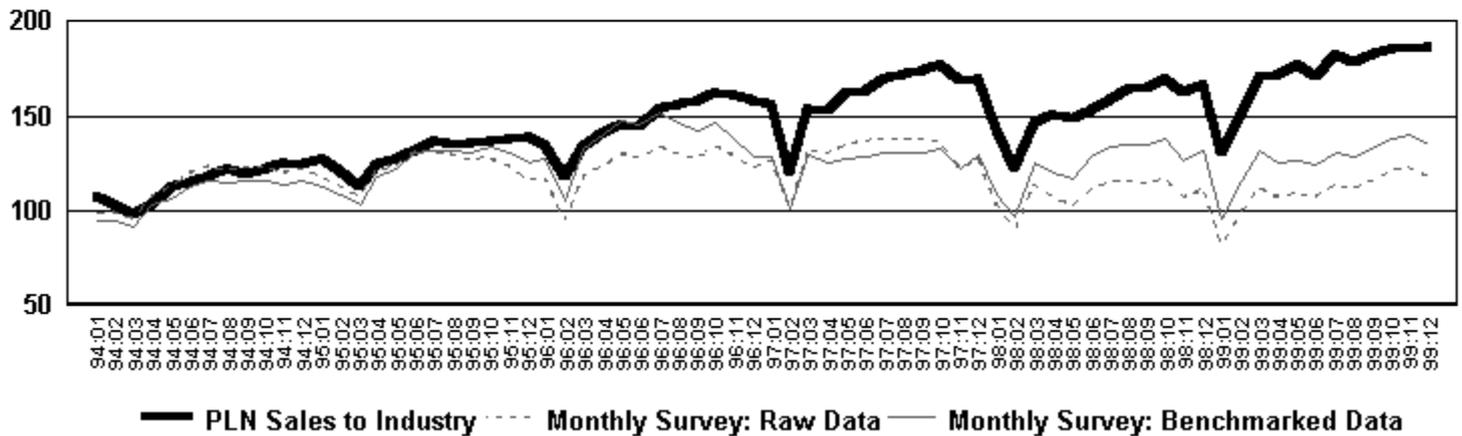
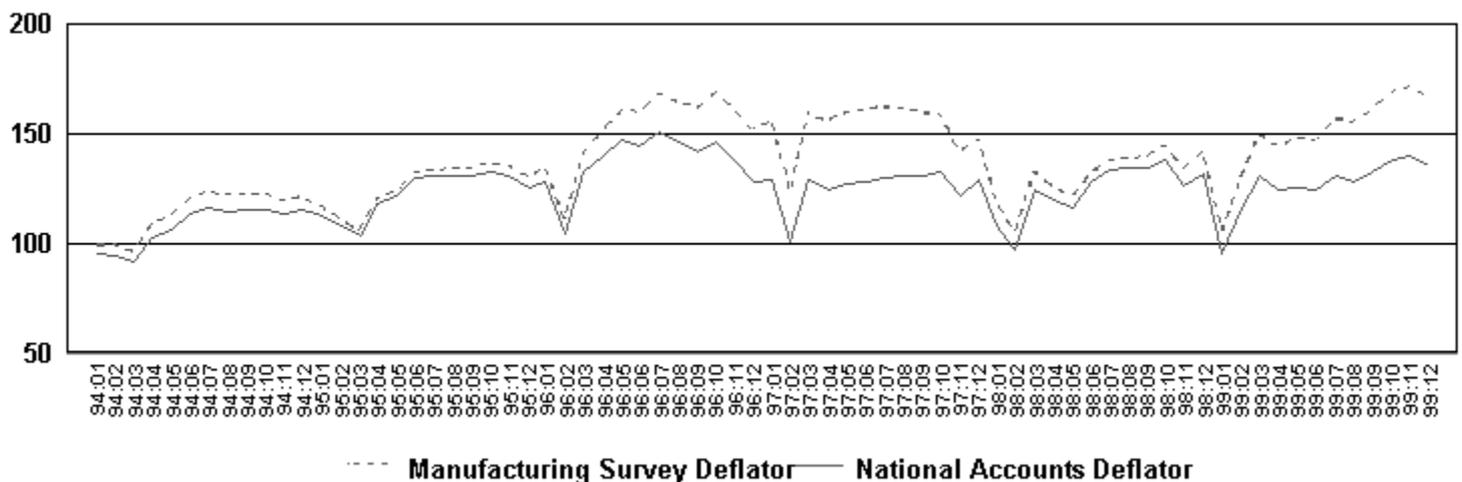


Figure 7: Benchmark Production Index Using National Accounts vs Manufacturing Survey Deflator



Note: all series have index 1993 = 100

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Note in particular the following:

- Both the PLN and the manufacturing survey series show the same strong seasonality which coincides with the occurrence of the Lebaran holidays. During the particular month in which Lebaran falls, production appears to slow down significantly then revert more or less to the same pre-Lebaran level in the following month.
- The PLN and the manufacturing survey series show consistent monthly movements over the period. Overall, monthly changes depicted by both series are in the same direction although their magnitudes may differ.
- Both the PLN and the manufacturing survey series show a noticeable effect of the economic crisis: the peak in production in 1997 appears to have occurred in October. However, while the PLN series shows that the pre-crisis trend in electricity consumption was reestablished in 1998 and 1999, the (raw, i.e. non-benchmarked) manufacturing survey series suggests that production levels in 1998 and 1999 remained more or less stagnant after the 1997 drop.
- Over the whole 1993-1999 period, the gap between the electricity consumption series and the (raw) manufacturing production series has widened considerably. That can be explained to a large extent by the fact that the (raw) manufacturing survey series reflects the behavior of the fixed panel of establishments in the survey while the electricity consumption series reflects the behavior of all establishments operating every year. The fixed panel in the manufacturing survey was selected from the 1990 population of establishments. As such, it is expected to represent the behavior of that particular population, not that of the (possibly changing) population every year.
- When one takes into consideration the effect of net births every year by benchmarking the raw series to the annual survey series, the result is a consistency between electricity consumption and benchmarked production through 1996 but a divergence between the two since 1997. Figures 5 and 6 show a widening gap between the two variables with a sharper trend in electricity consumption than in manufacturing production. If these trends are a true reflection of what has actually happened, i.e. if the difference is not due to reporting or other possible data errors, one implication may be that the medium and large manufacturing sector has experienced a noticeable shift towards more electricity-intensive production in the past few years.
When did this shift occur? The answer depends on which

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benchmarked series we use. Figure 5, which uses the manufacturing survey deflator, suggests that the possible shift towards more electricity-intensive production started in 1997. On the other hand, Figure 6, which uses the national accounts deflator, suggests that the shift actually started in 1996. Furthermore, while the story in Figure 5 suggests a significant pickup in production activity in 1999, that in Figure 6 suggests that production in 1999 remained stagnant.

Which one of the two stories is correct? This report will not pass judgement on this issue, but rather will present both and leave it up to the reader to decide which series provides a more plausible story. To make such evaluation easier, we have provided (in Figure 7) a direct comparison of the effect of using the two deflators on the benchmarked series. The results in the following section (and in the appendices) will provide further input for the reader's evaluation.

2. Production & Employment

The previous section focused solely on production by medium and large manufacturing establishments. This section adds the employment dimension, compares the behavior of the two variables and the combined effect of both. Figure 8 compares the trend in employment and production in the raw series. Figures 9 and 10 compare the trend in these variables for the benchmarked series (the first using the manufacturing survey deflator and the second using the national accounts deflator). Finally, Figure 11 combines production and employment into one variable (labor productivity) and compares the three series that can be derived from the data in the previous figures. The following observations are worth noting:

- Unlike production, employment of medium and large manufacturing establishments does not fluctuate from month to month and does not show any seasonality. Establishments do not appear to respond to short-term changes in demand by increasing or decreasing their number of employees.
- A secular downward trend in employment since 1993 is unmistakable among establishments in the quarterly manufacturing survey (Figure 8). These were establishments that existed in 1990 and continue to operate through 1999. The trend does not appear to have been affected in any major way by the crisis. Compare that with the steady upward trend in production which turned into stagnation after the crisis.
- In contrast, the trend in employment among the whole population of medium and large establishments (Figures 9 and 10) was sharply upward until 1995, then stayed more or less flat until 1999.

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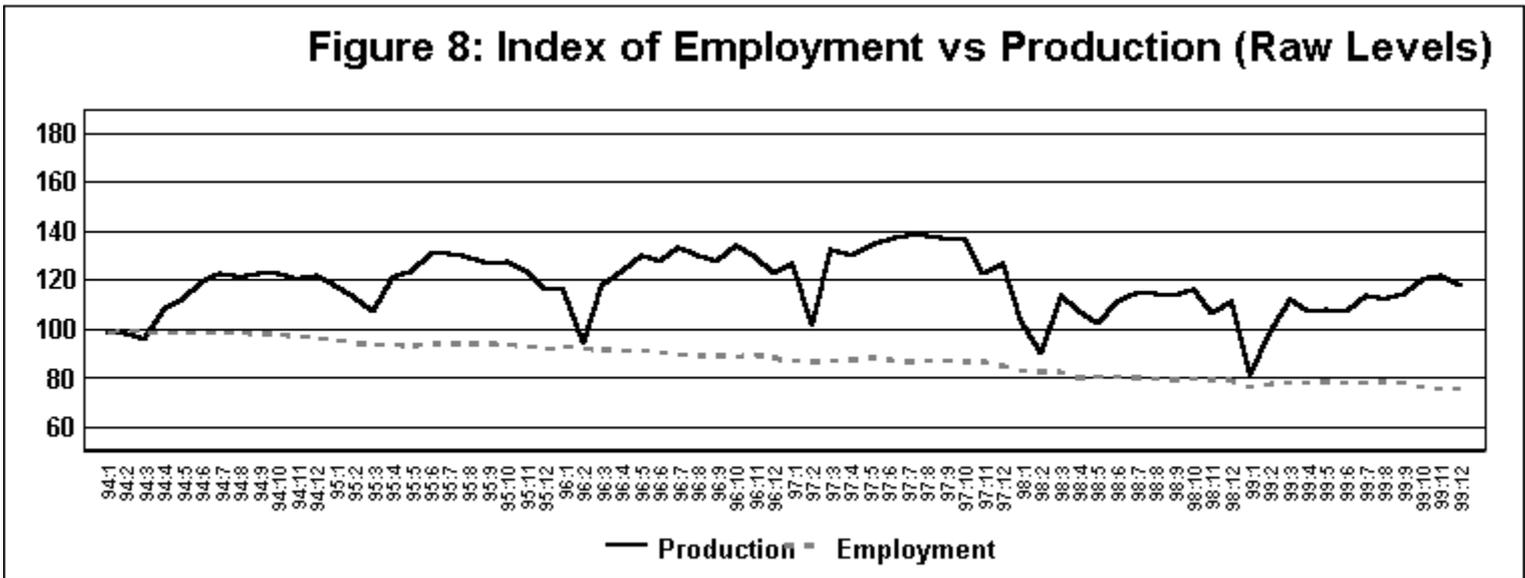
- As to labor productivity (Figure 11), the three data series provide three different patterns: that of establishments in the manufacturing survey rose steadily until 1997, went down in 1998 then started rising again in 1999; that of the population using the manufacturing survey deflator rose sharply until 1996, declined in 1997 and 1998 then started rising again in 1999; that of the population using the national accounts deflator rose until 1996, then declined and stagnated until 1999.

At the sectoral level, i.e. at the 2-digit ISIC level, the behavior of establishments in the survey and that of the population varies. Appendix A provides three sets of figures for every ISIC with production using the manufacturing survey deflator, and Appendix B provides the same sets of figures with production using the national accounts deflator.

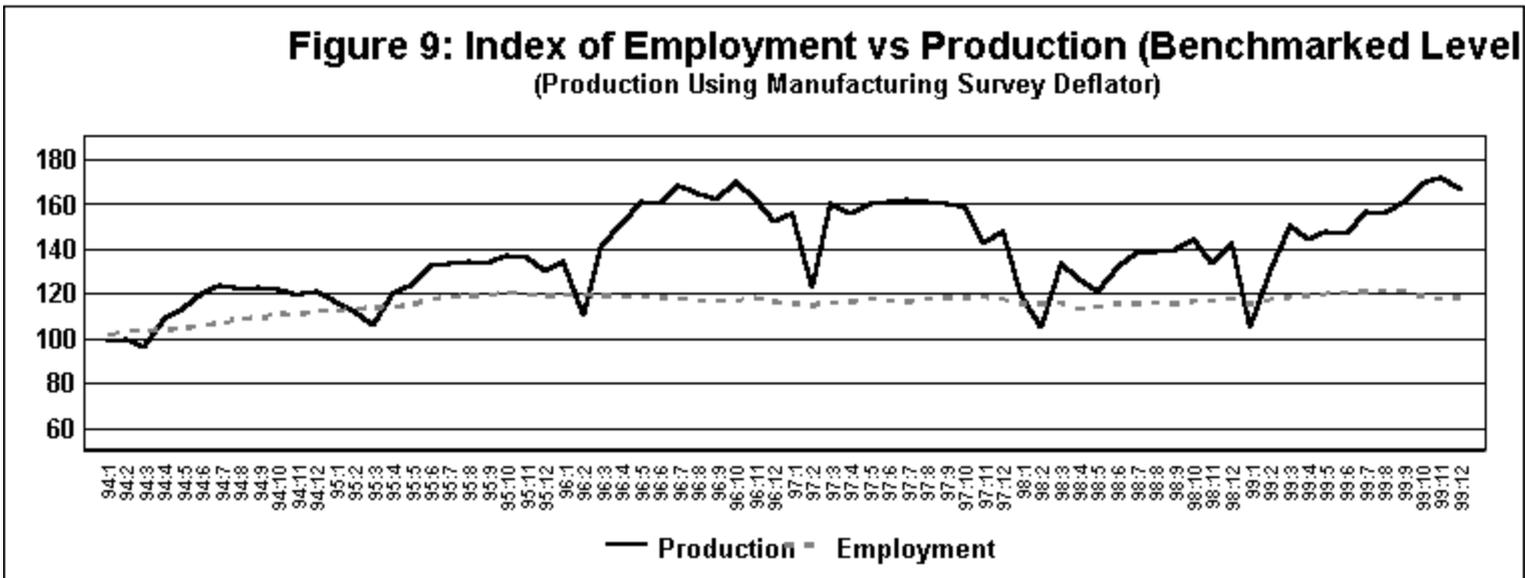
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Figure 8: Index of Employment vs Production (Raw Levels)



**Figure 9: Index of Employment vs Production (Benchmarked Level
(Production Using Manufacturing Survey Deflator))**



Note: all series have index 1993 = 100

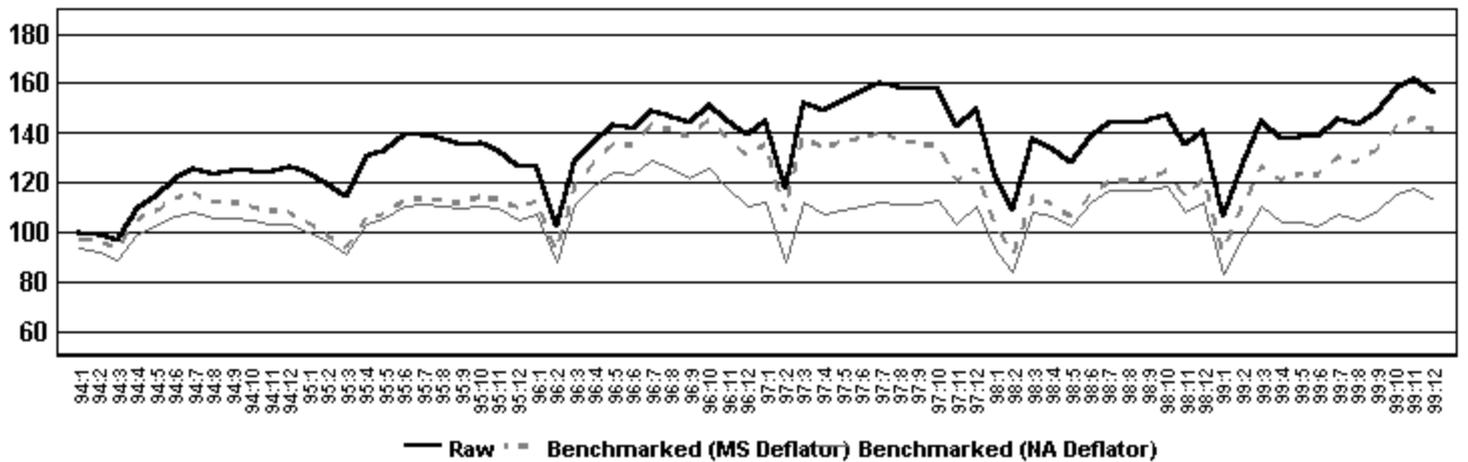
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Figure 10: Index of Employment vs Production (Benchmarked Level)
(Production Using National Accounts Deflator)



Figure 11: Index of Labor Productivity



Note: all series have index 1993 = 100

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II. CONCLUSIONS AND RECOMMENDATIONS

The above analysis leads to the following conclusions:

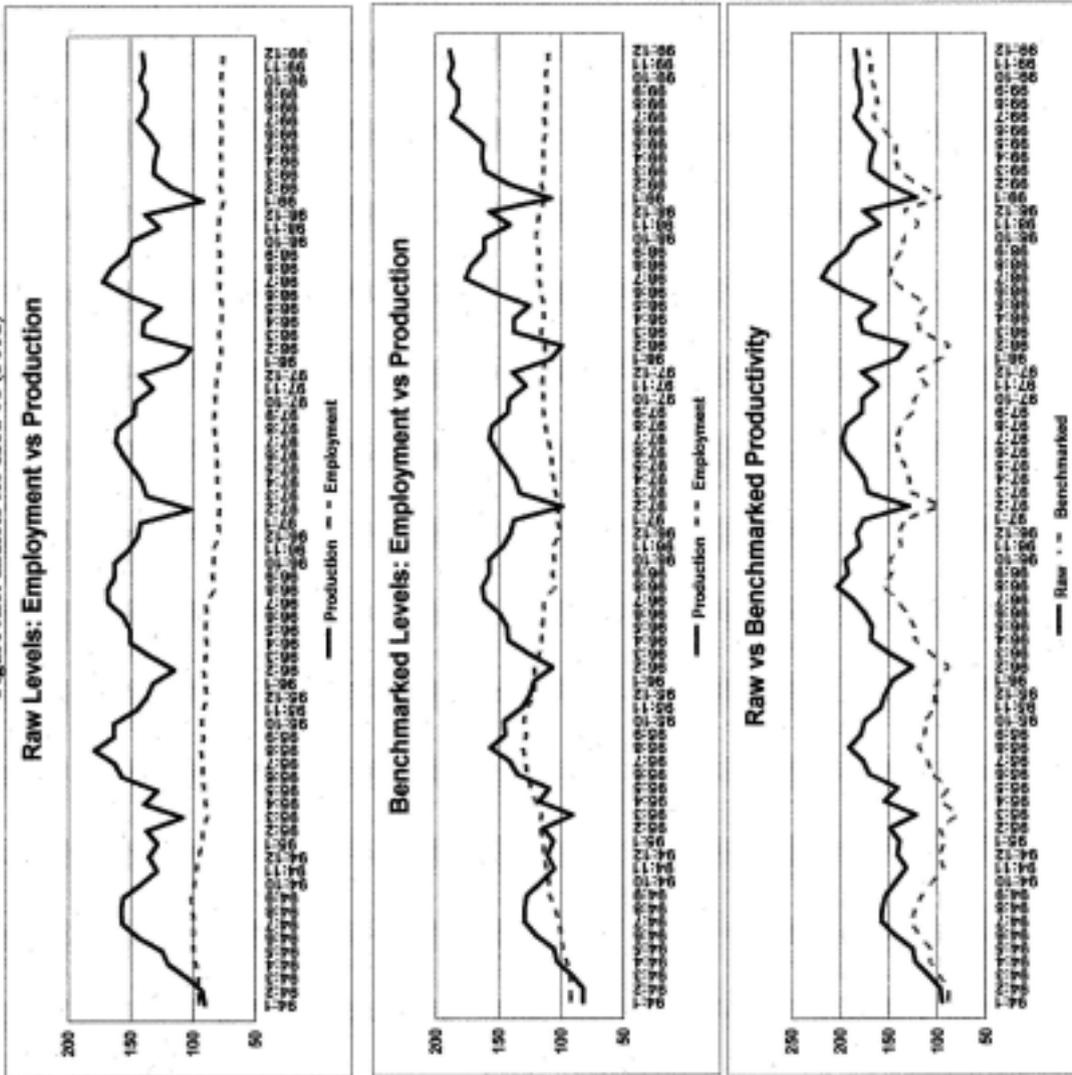
- First, the monthly data collected as part of the quarterly manufacturing survey can be highly useful to policy makers in Indonesia. They provide a plausible story for the 1993-1999 period about the behavior of establishments in the fixed survey panel.
- Secondly, when combined with results of the more complete annual survey, by benchmarking the results of the quarterly survey to their relevant annual levels, additional useful insight is obtained. The behavior of establishments in the fixed panel can be compared and contrasted with that of the population of medium and large establishments as a whole.

Such insight would be invaluable for national accounts compilation and for industrial and employment policy making if obtained on a timely basis. Our recommendations, therefore, are for BPS to:

- Make available to users a monthly raw as well as benchmarked series on production and employment for the 1993-1999 period, with as much detail (in terms of ISIC breakdown) as can be provided without compromising BPS's confidentiality policy.
- Consider releasing a raw "employment index" series in addition to its "production index" series on a monthly basis in its current survey (which uses 2000 as the numeraire period).
- When data from the annual survey are finalized for a particular year, benchmark that year's monthly series and make available to users.

APPENDIX A
RESULTS AT THE 2-DIGIT ISIC USING THE
MANUFACTURING SURVEY DEFLATOR

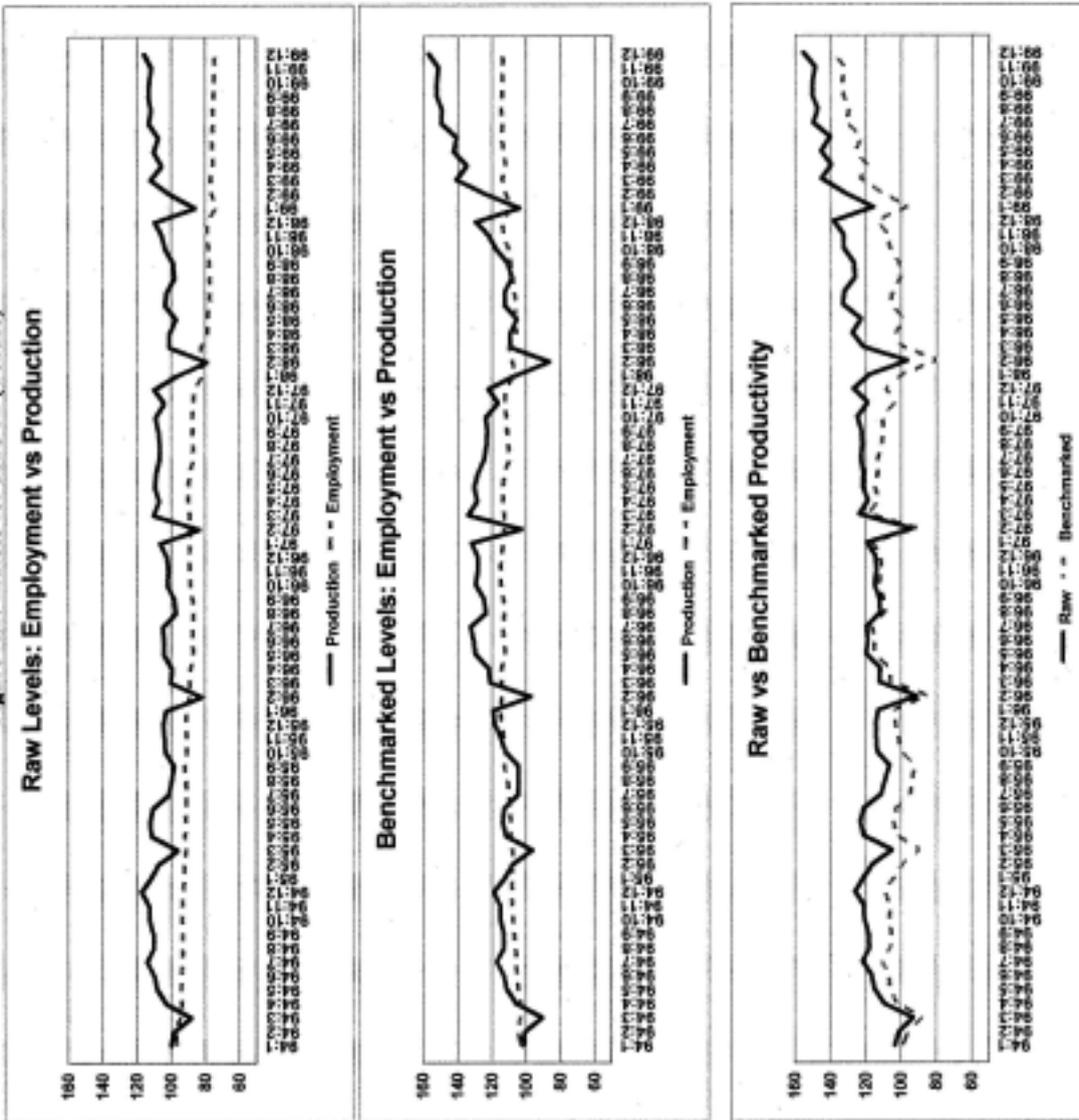
Figure A.1: Indices for ISIC 31 (Food)



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Monthly Manufacturing Production and Employment Indices

Figure A.2: Indices for ISIC 32 (Textile)



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Monthly Manufacturing Production and Employment Indices

Figure A.3: Indices for ISIC 33 (Wood)

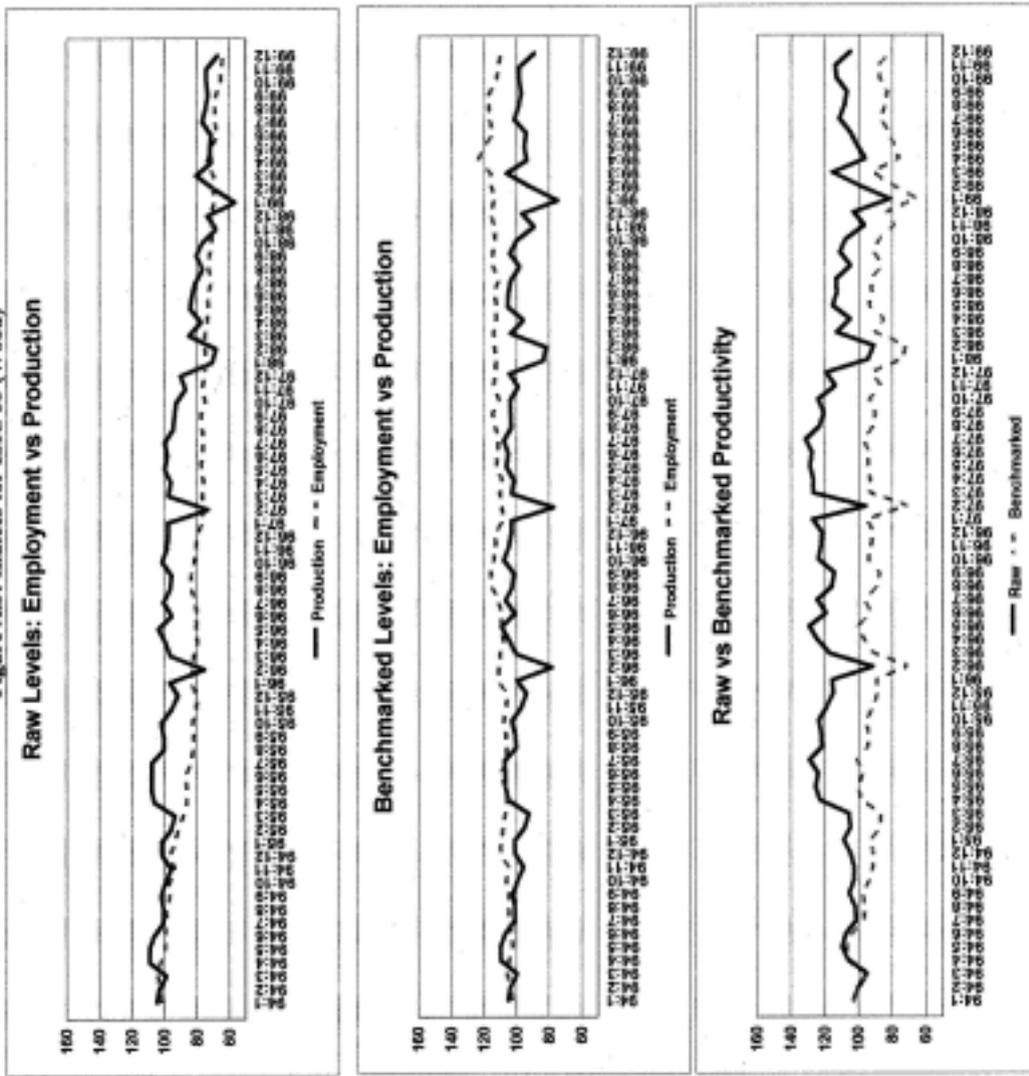
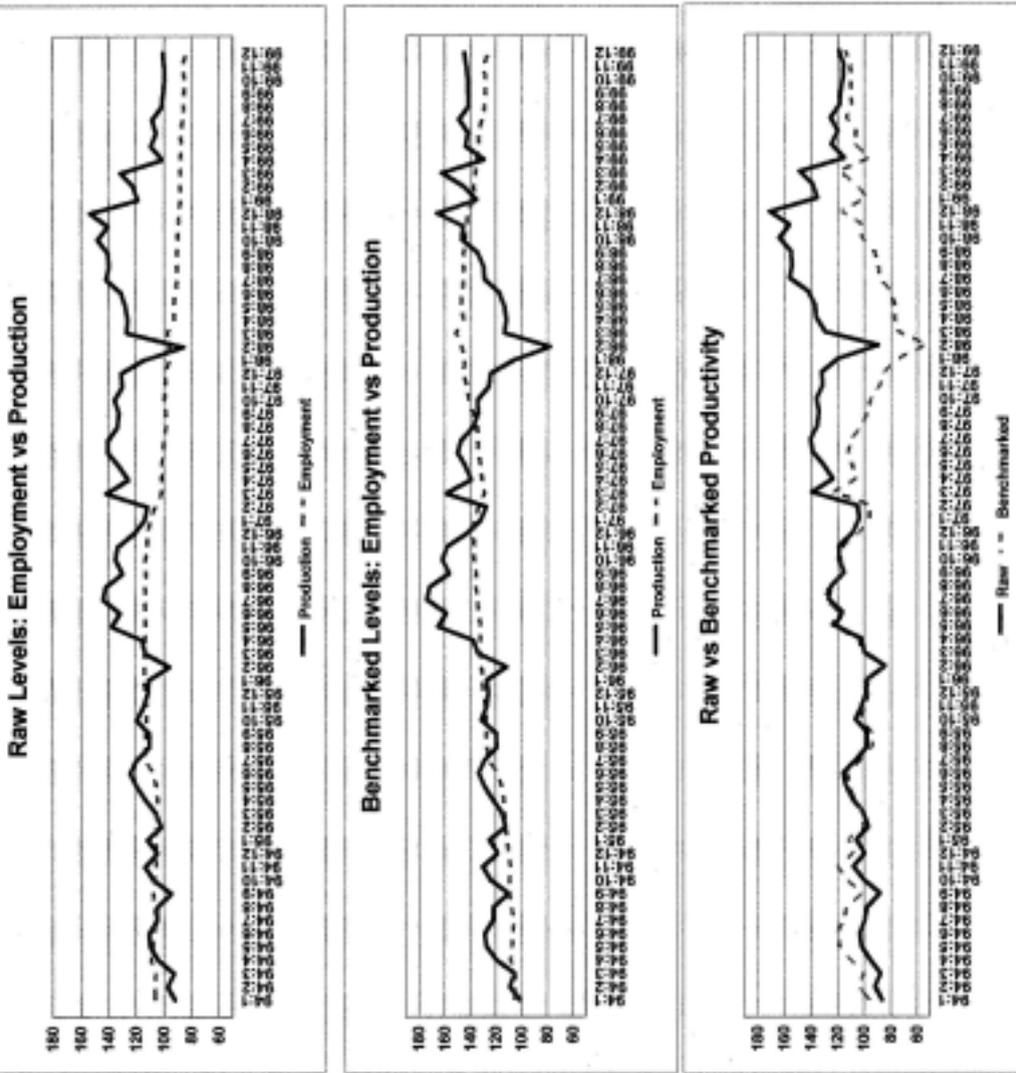


Figure A.4: Indices for ISIC 34 (Paper)



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Monthly Manufacturing Production and Employment Indices

Figure A.5: Indices for ISIC 35 (Chemicals)

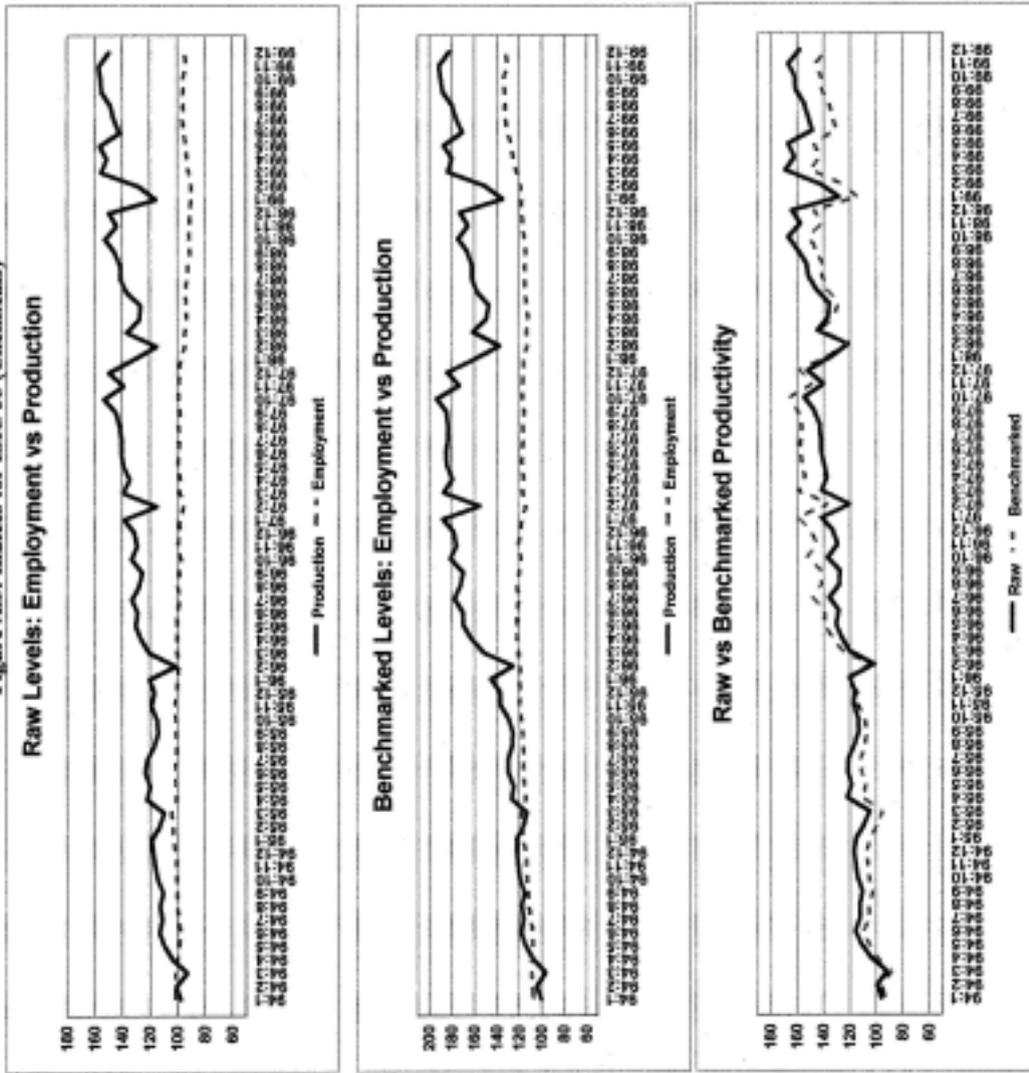
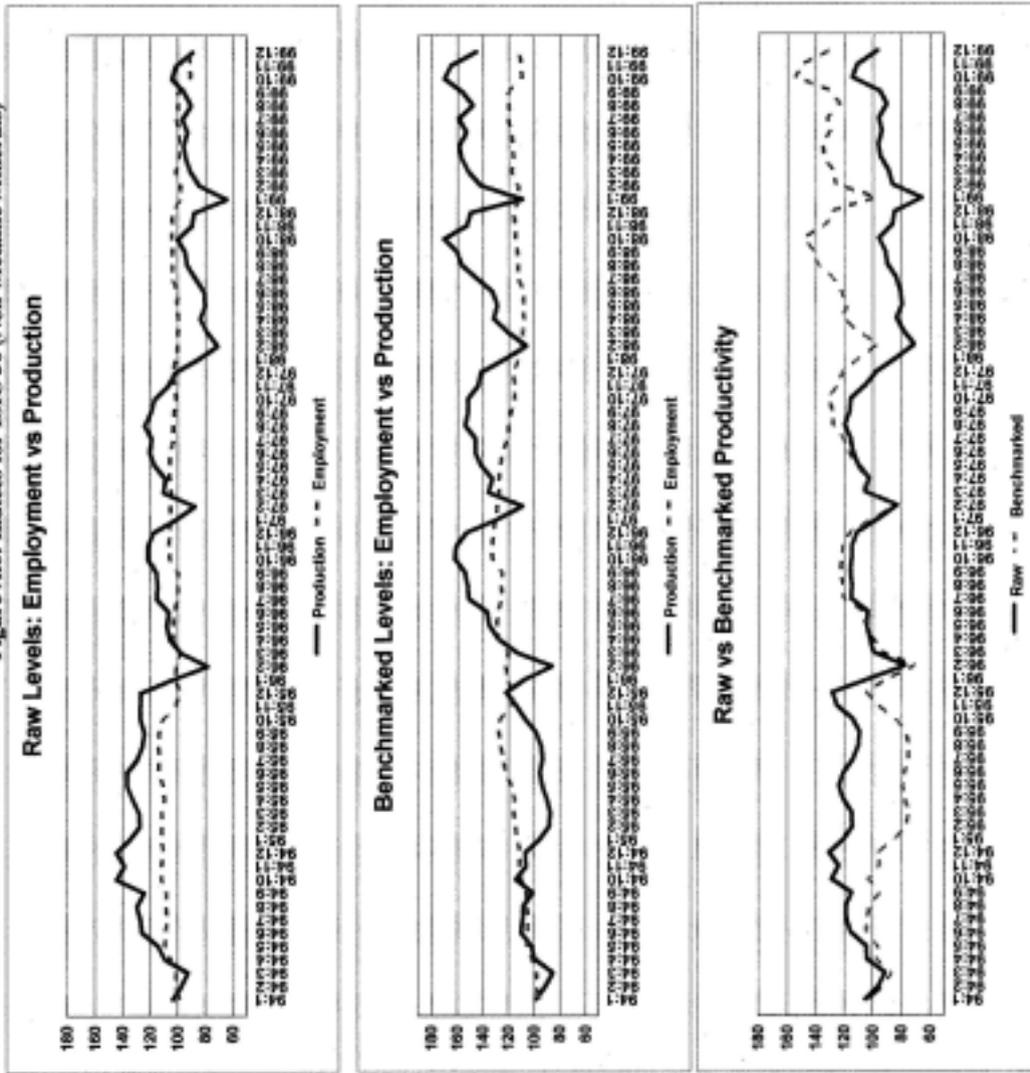


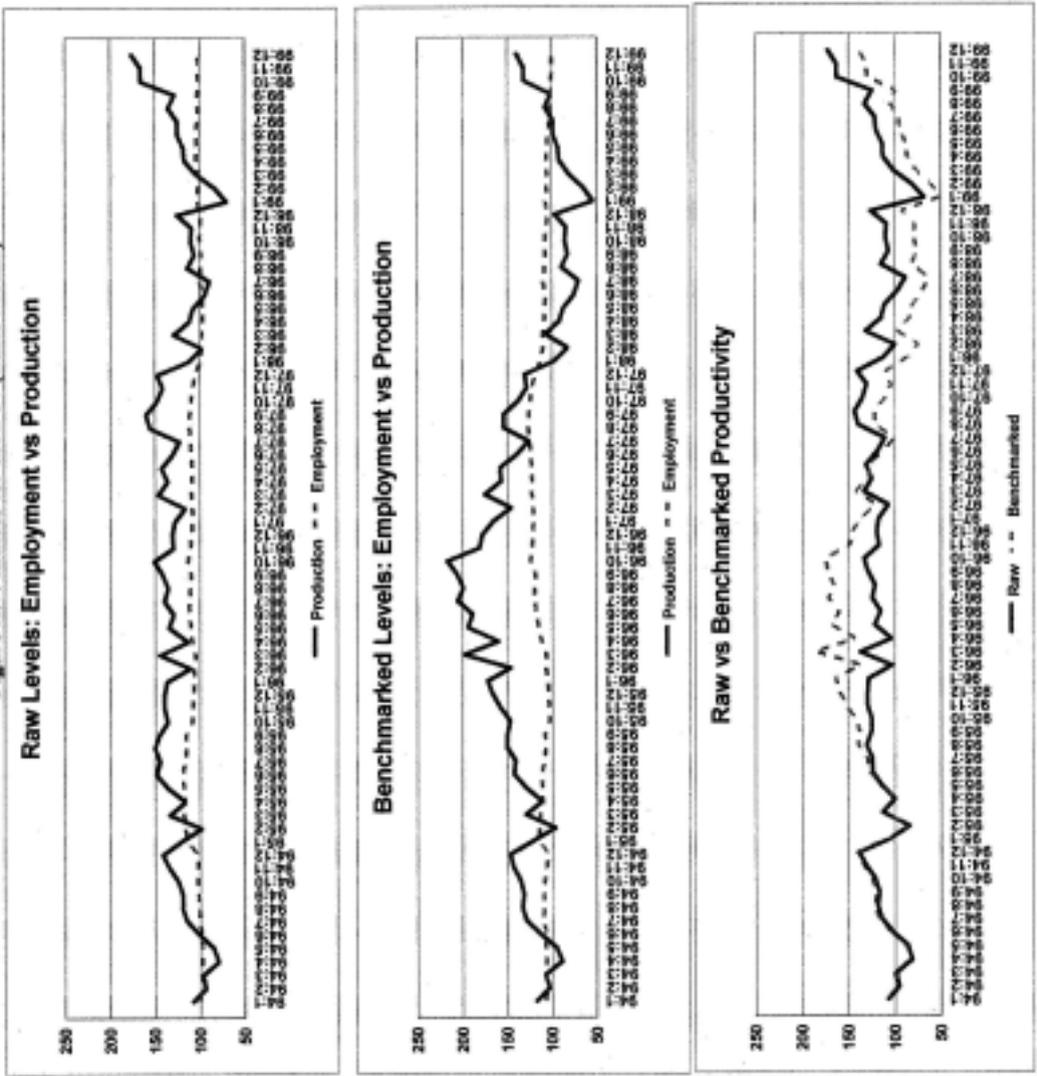
Figure A.6: Indices for ISIC 36 (Non-Metallic Minerals)



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Monthly Manufacturing Production and Employment Indices

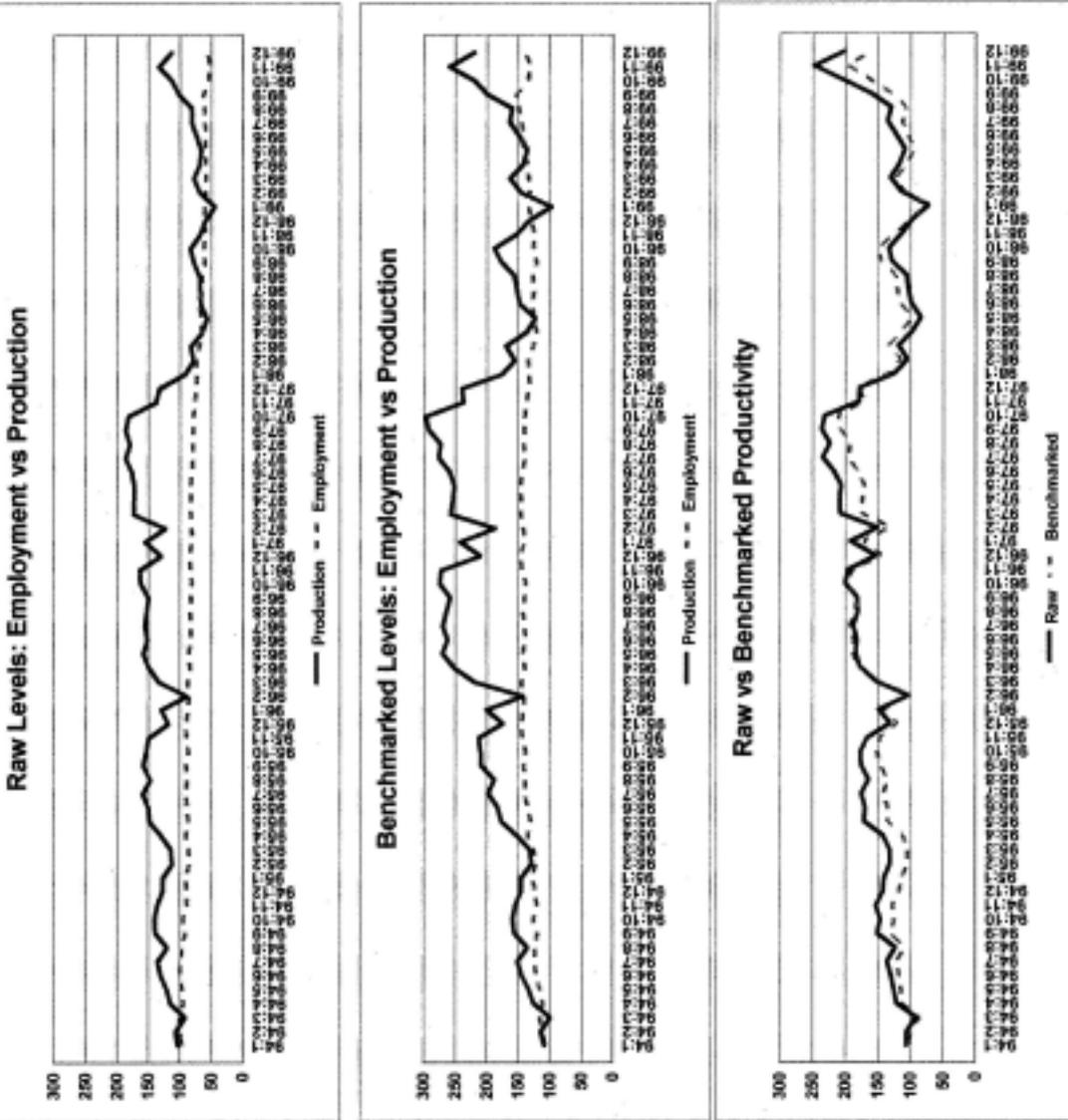
Figure A.7: Indices for ISIC 37 (Basic Metals)



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Monthly Manufacturing Production and Employment Indices

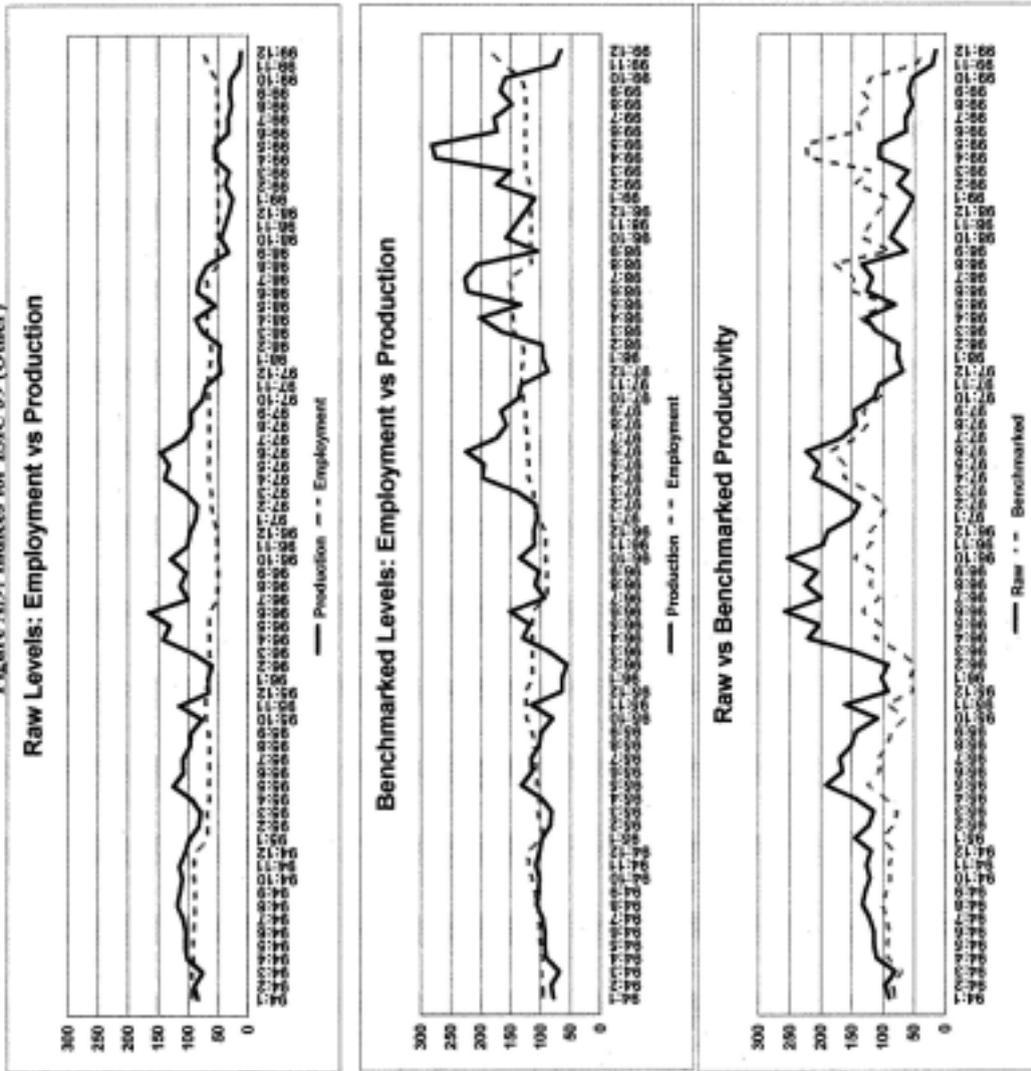
Figure A.8: Indices for ISIC 38 (Fabricated Metals)



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Monthly Manufacturing Production and Employment Indices

Figure A.9: Indices for ISIC 39 (Other)



APPENDIX B

RESULTS AT THE 2-DIGIT ISIC USING THE NATIONAL ACCOUNTS DEFLATOR

Figure B.1: Indices for ISIC 31 (Food)

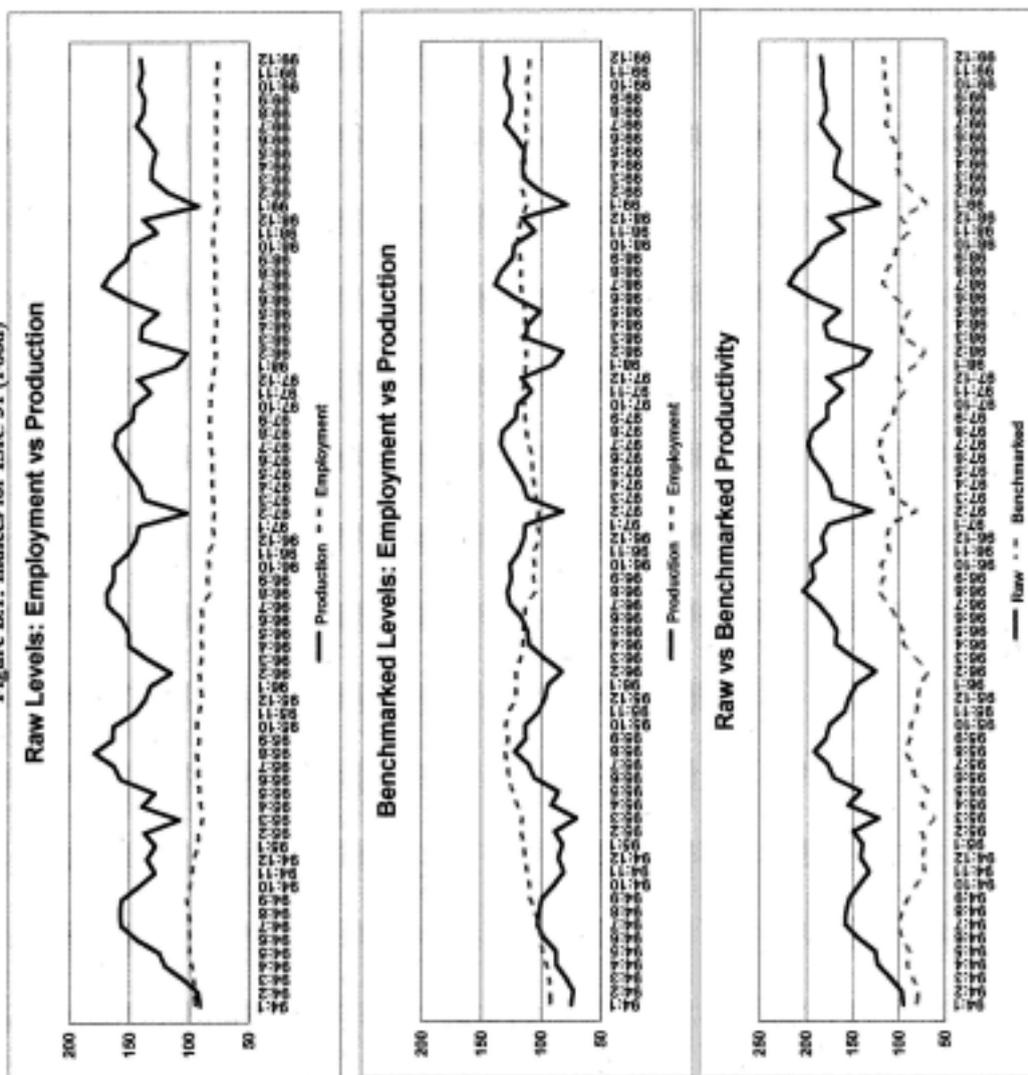
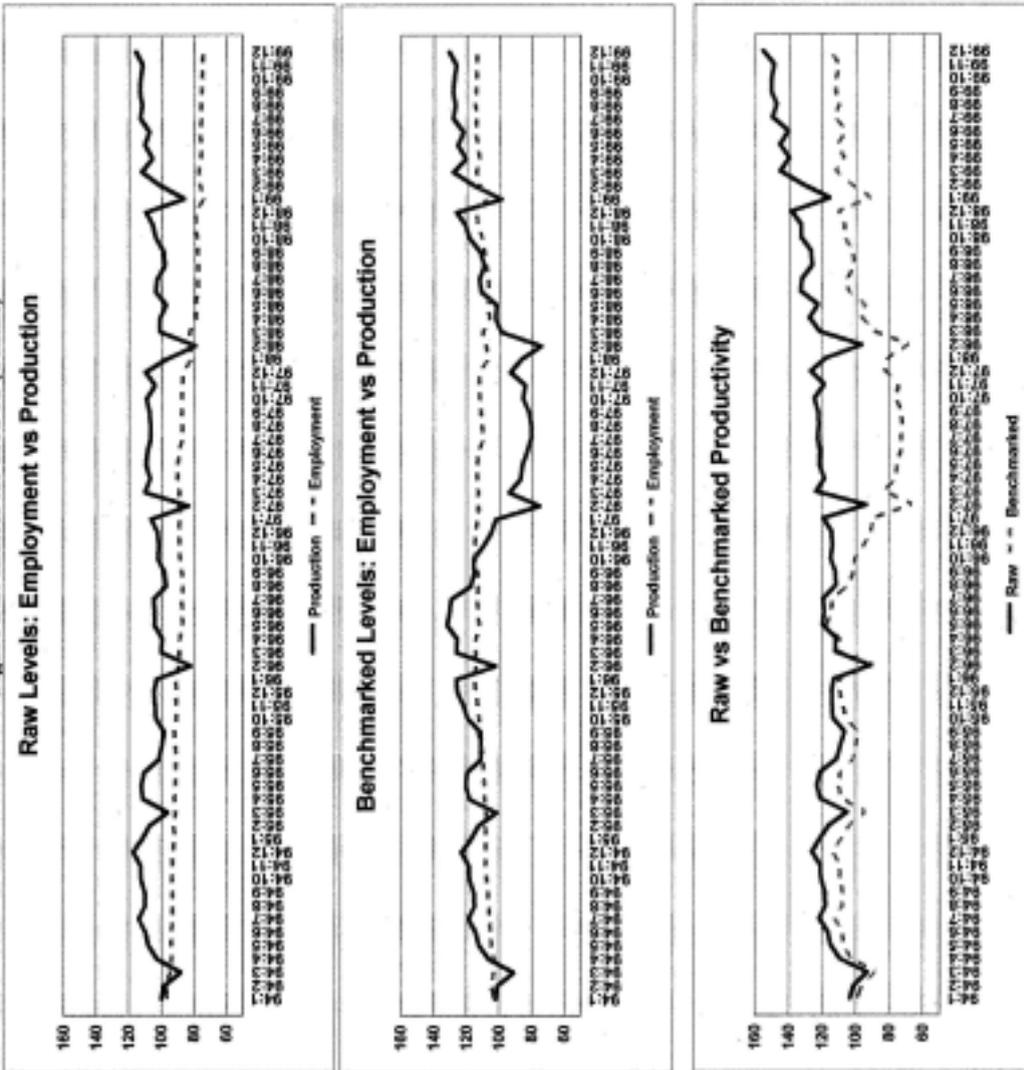


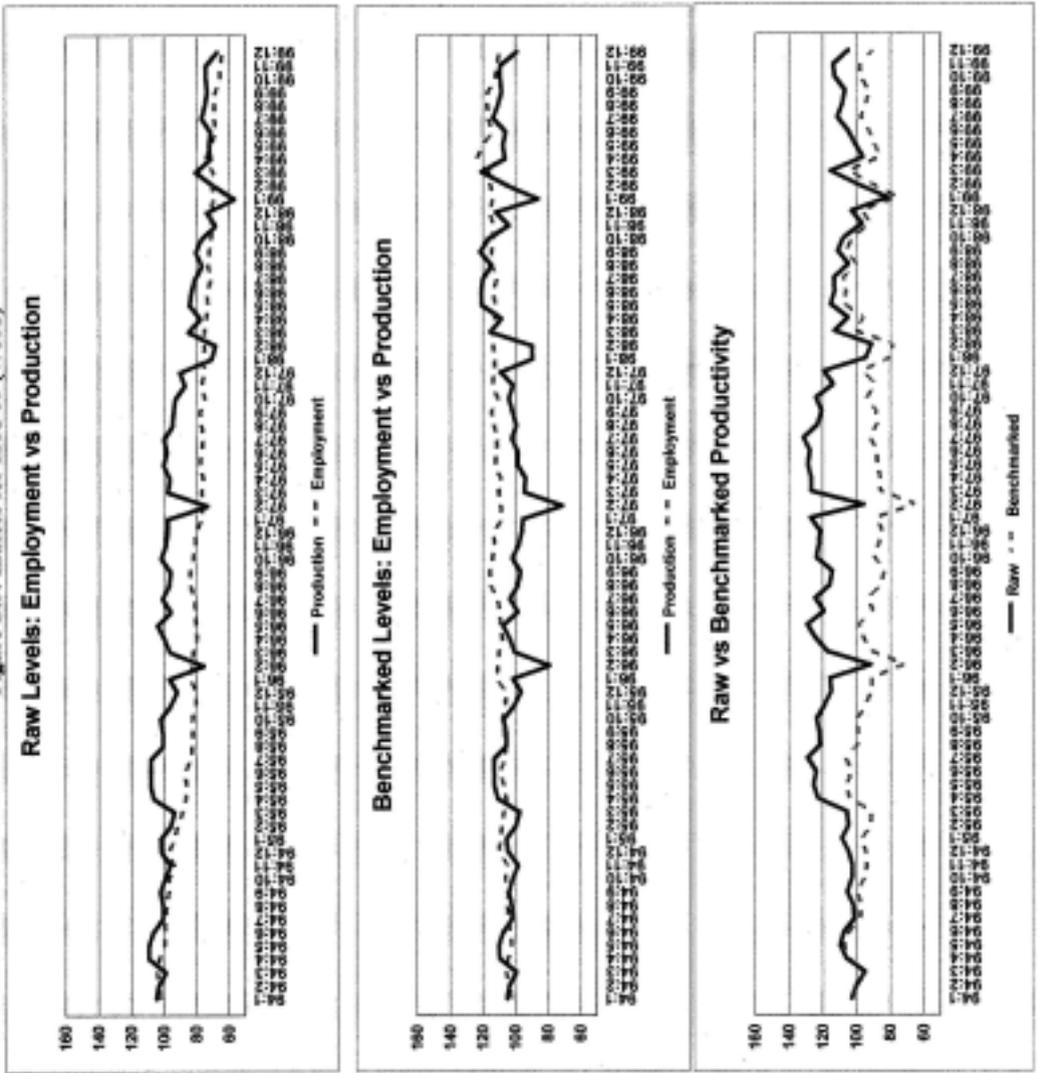
Figure B.2: Indices for ISIC 32 (Textile)



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Monthly Manufacturing Production and Employment Indices

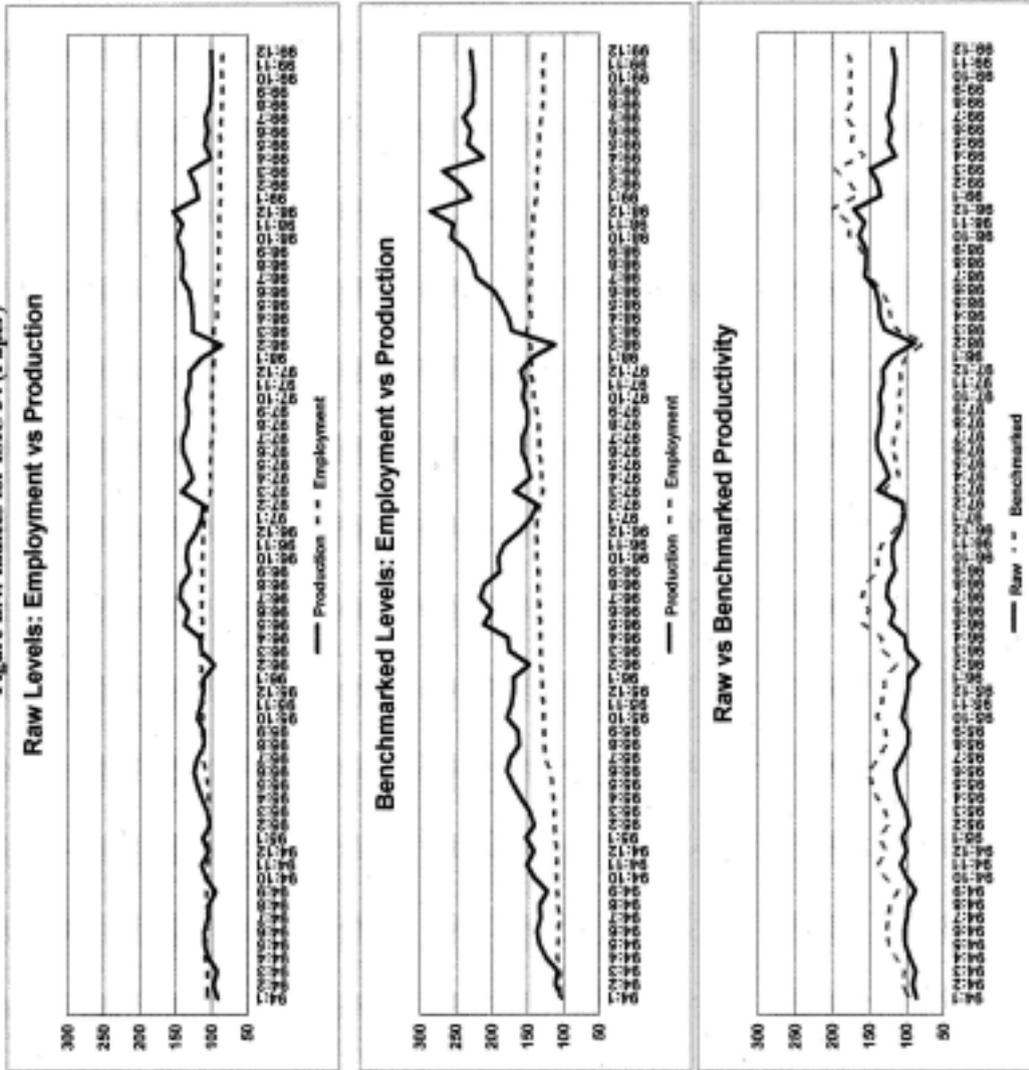
Figure B.3: Indices for ISIC 33 (Wood)



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Monthly Manufacturing Production and Employment Indices

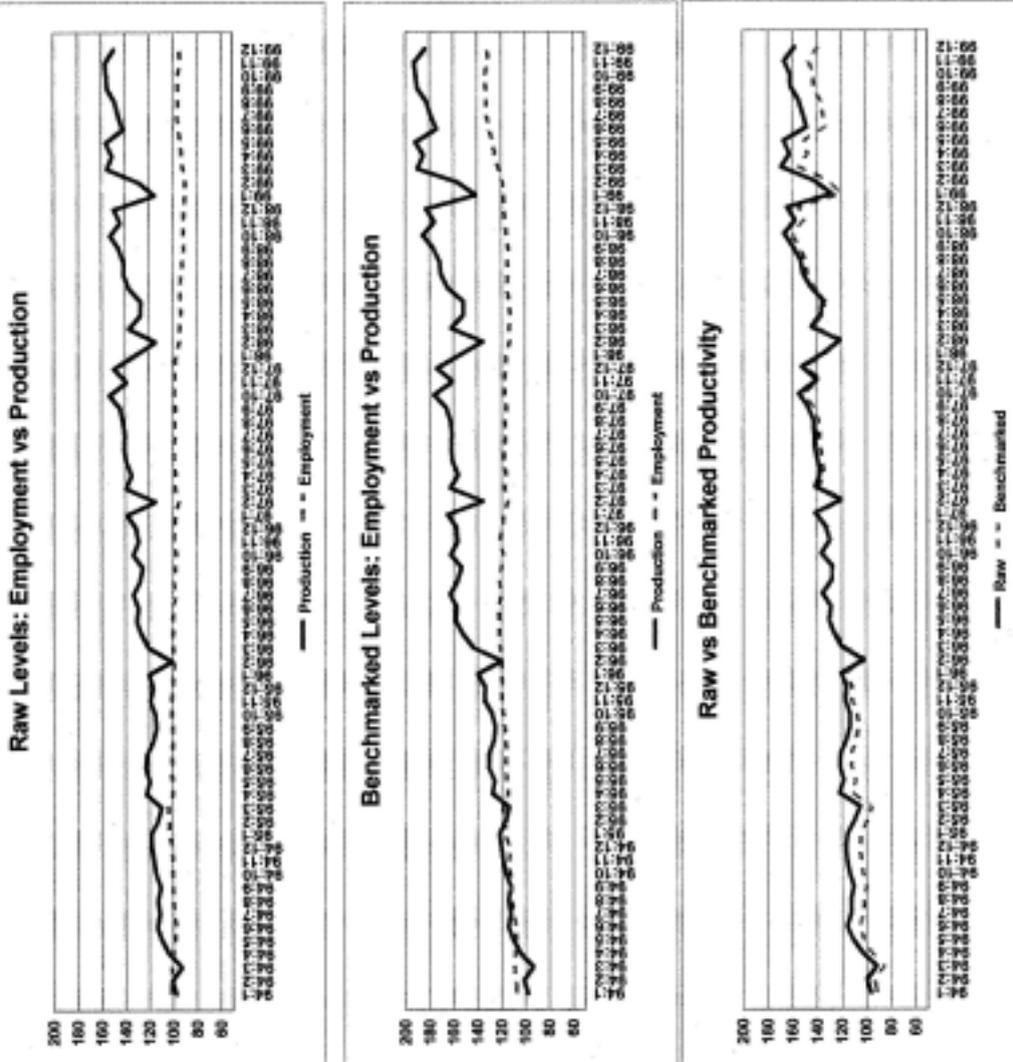
Figure B.4: Indices for ISIC 34 (Paper)



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Monthly Manufacturing Production and Employment Indices

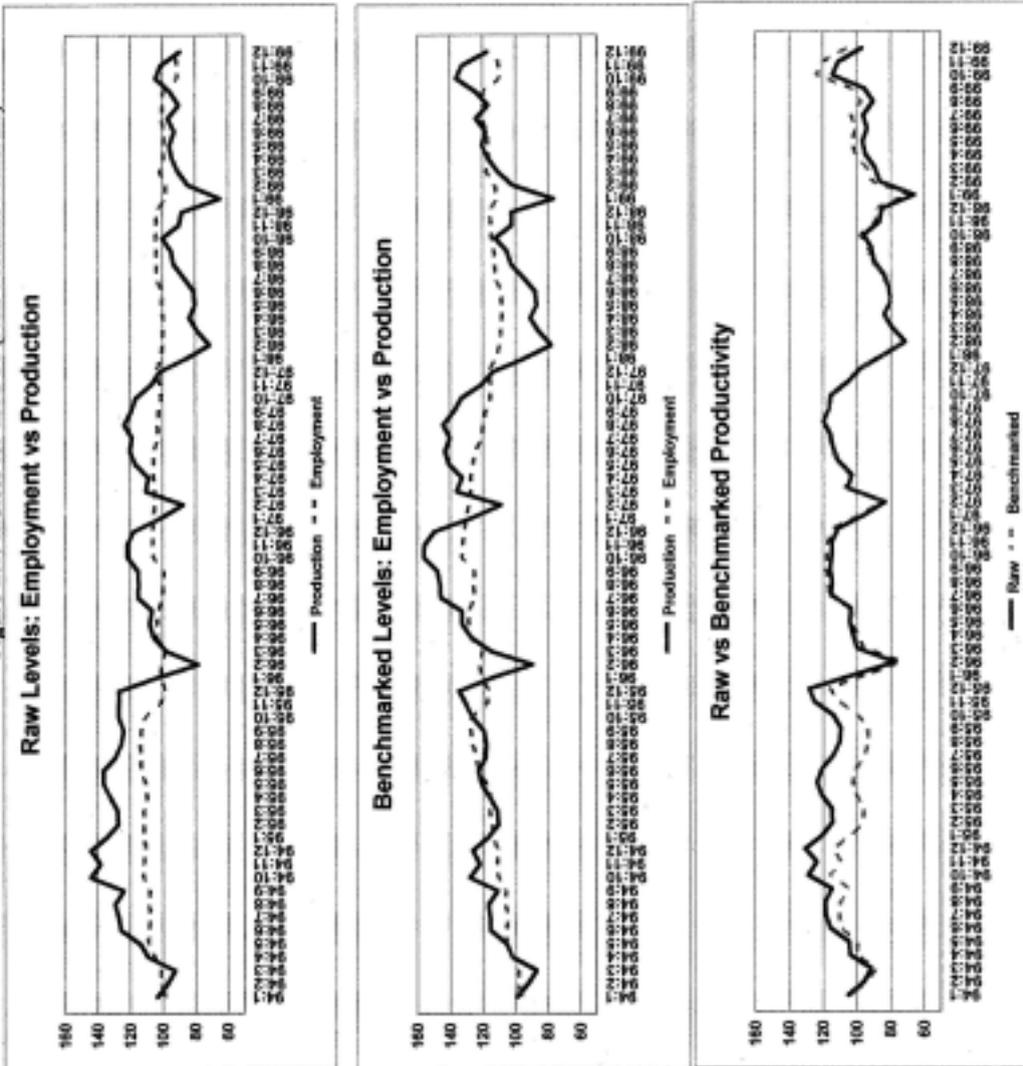
Figure B.5: Indices for ISIC 35 (Chemicals)



April 24, 2001

Monthly Manufacturing Production and Employment Indices

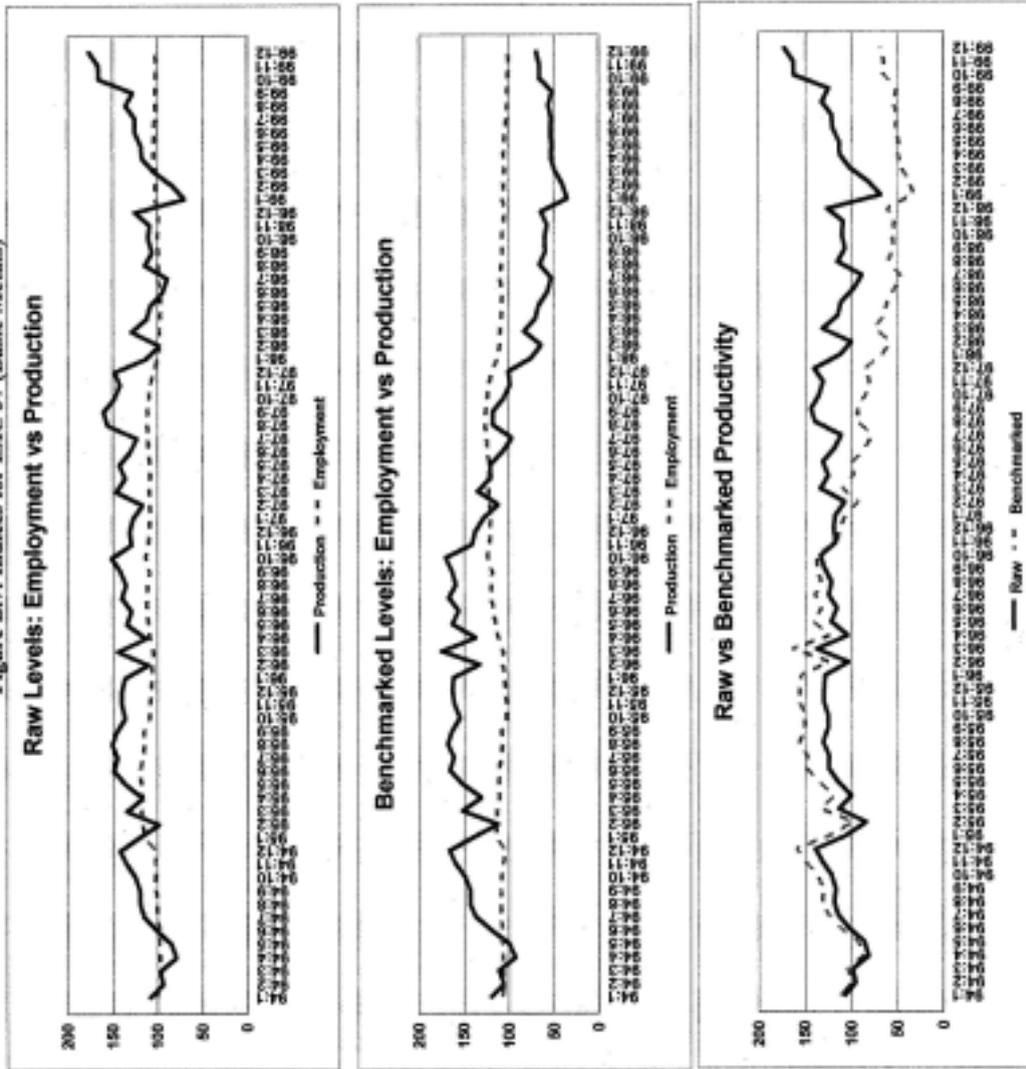
Figure B.6: Indices for ISIC 36 (Non-Metallic Minerals)



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Monthly Manufacturing Production and Employment Indices

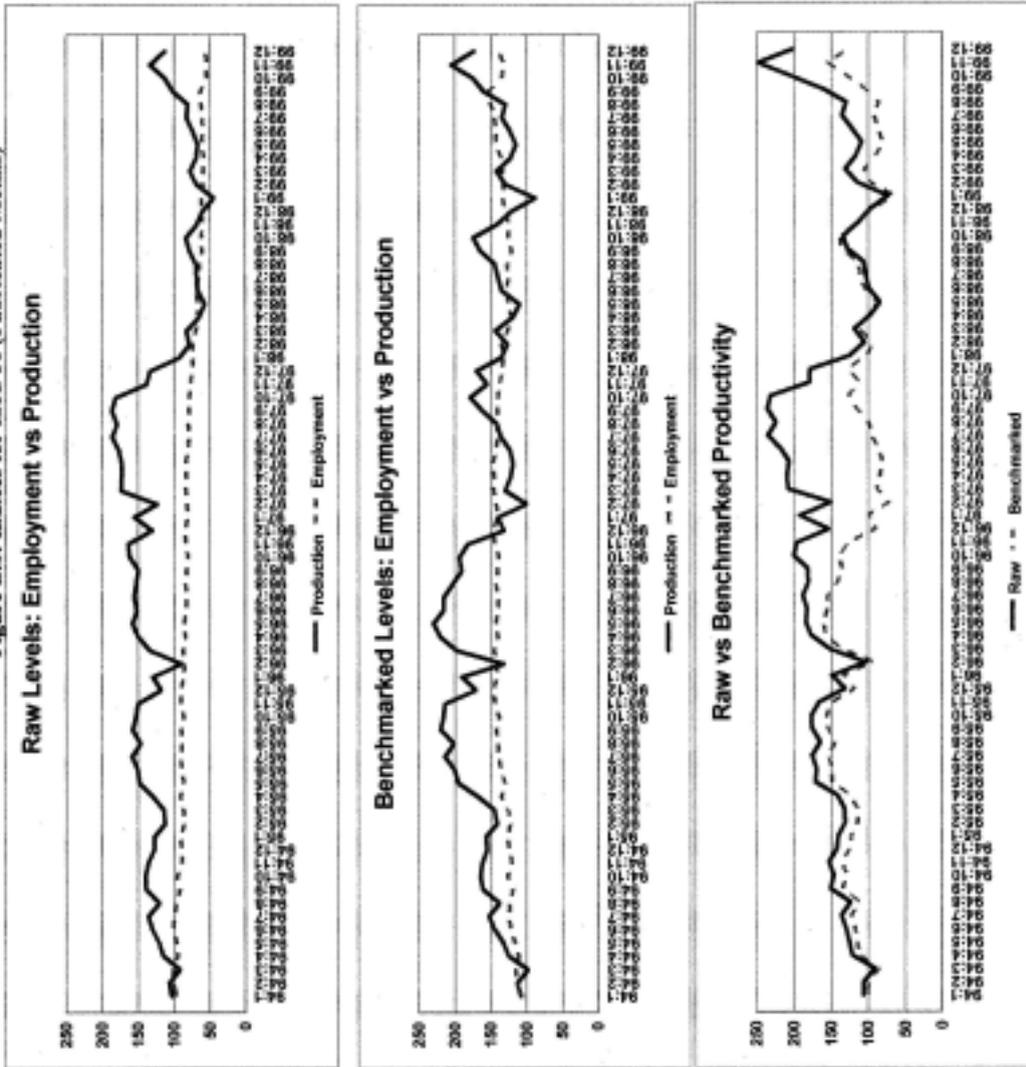
Figure B.7: Indices for ISIC 37 (Basic Metals)



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Monthly Manufacturing Production and Employment Indices

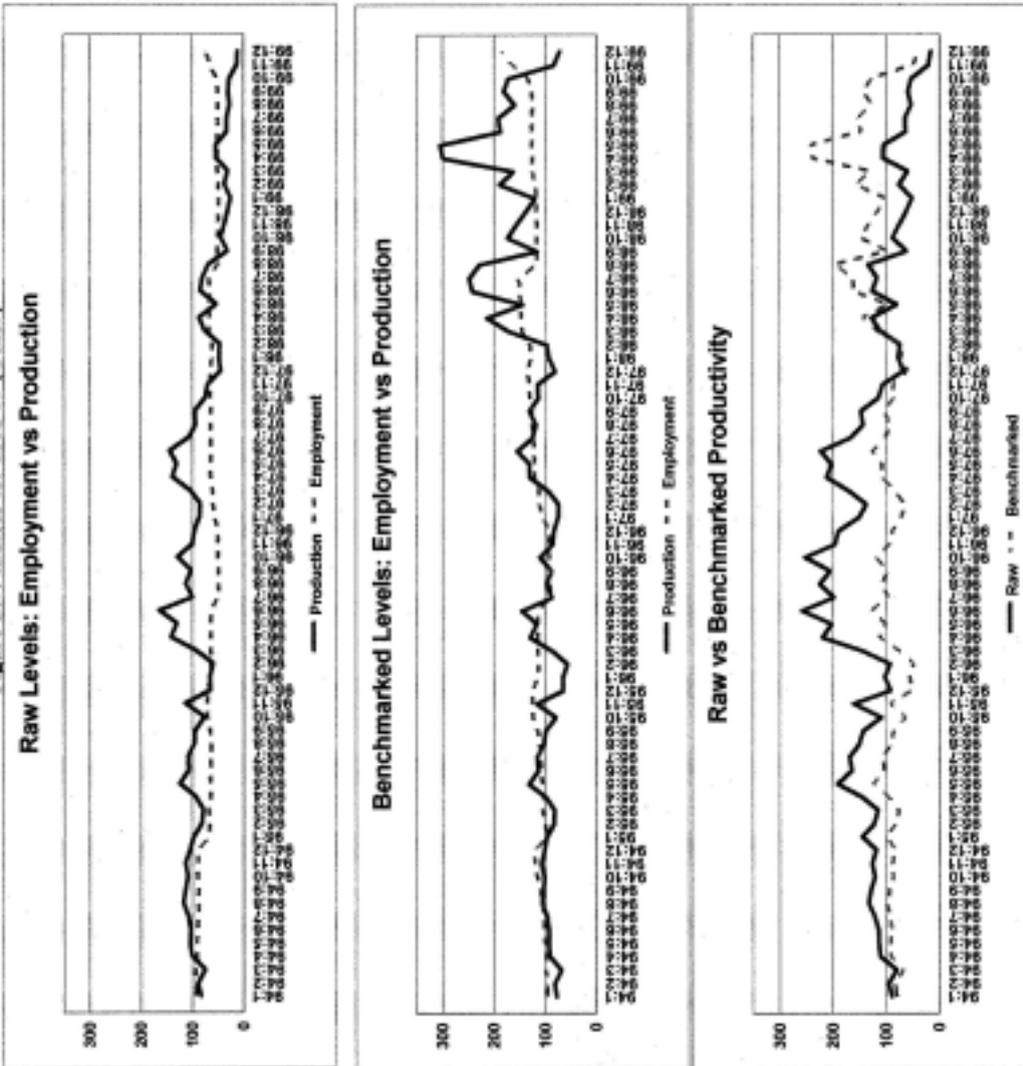
Figure B.8: Indices for ISIC 38 (Fabricated Metals)



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Monthly Manufacturing Production and Employment Indices

Figure B.9: Indices for ISIC 39 (Other)

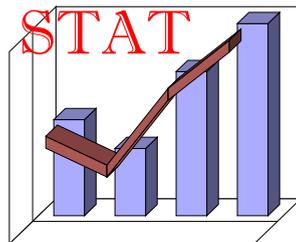


CHAIN LINKING NATIONAL ACCOUNTS

Report # 34
Statistical Paper # 7

by
Yahya Jammal

June, 2001



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USAID Contract No. PCE-I-00-99-00009-00

June 5, 2001

Chain Linking National Accounts

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I. INTRODUCTION¹

Since its first publication of the nation's accounts in 1966, BPS has been producing these accounts in both "current prices" of the year in question and "constant prices" of some fixed reference year. This has been the standard international practice advocated by the United Nations since 1953 and formalized with the 1968 *System of National Accounts* (SNA). To economists, the GDP "at constant prices" has been the single tool used to approximate "real" GDP, which measures GDP after deducting the impact of price changes. Dissatisfaction with the use of fixed weights due to the changing structure of economies led to a different recommended approach as part of the updated SNA in 1993.

The 1993 SNA recommended using chained indices for measuring "real" GDP (and its components) instead of its traditional measurement at "constant prices". As such, this methodology would use *changing* weights every year instead of the *fixed* weights of the year chosen for reference. Some industrialized countries have adopted the new methodology, although at different times since 1993 and to varying degrees. The IMF and other international bodies have been urging developing countries to adopt it. BPS has decided to adopt this new methodology gradually and to carefully study its implications in the next few years. This report attempts to assist BPS in educating users about the reasons for adopting this methodology and its implications, both conceptual and practical.

II. PRESENT MEASUREMENT OF REAL GDP

Perhaps the best way to start is by defining terms clearly in order to avoid any semantic confusion. It is generally claimed that present Indonesian "real" economic data use 1993 as a "base year". The word "base" sometimes refers to the year from which fixed weights are derived, the year used as a numeraire (or reference) or both. In this report we will refer to the first as the "weighting year" and the second as the "numeraire year". The distinction between the two is very important: while the choice of a weighting year makes a substantial difference in the final results, the choice of a numeraire year is irrelevant. The discussion that follows will demonstrate that.

Let us take the very simple economy illustrated in Table 1. This economy produced only two commodities between 1983 and 2000: rice and computers. The first commodity has had both a stable price and quantity produced while the second commodity has seen its production double between 1983 and 1993 as a result of the halving of its price and tripling between 1993 and 2000 following a further halving of its price.

¹ I am grateful to Frank de Leeuw, Kusmadi Saleh and John Kuiper for valuable comments on earlier drafts of this report.

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Table 1
Illustrative Example of Production in a Simple Two-Commodity Economy

Product	1983			1993			2000		
	Price	Quantity	Value	Price	Quantity	Value	Price	Quantity	Value
Rice	1	50	50	1	50	50	1	50	50
Computers	10	5	50	5	10	50	2.5	30	75
All Products	100			100			125		

The structure of the economy remained the same between 1983 and 1993, i.e. equal shares of total value for the two commodities, but is different in 2000: the share of the computer industry climbed to 60%. How is real production measured under the current BPS methodology? Tables 2 and 3 shed some light on this issue.

Table 2
Production Valued at Constant Prices of Alternative Years

Product	Prices of 1983			Prices of 1993			Prices of 2000		
	1983	1993	2000	1983	1993	2000	1983	1993	2000
Rice	50	50	50	50	50	50	50	50	50
Computers	50	100	300	25	50	150	12.5	25	75
All Products	100	150	350	75	100	200	62.5	75	125
Growth									
Rice		0%	0%		0%	0%		0%	0%
Computers		100%	200%		100%	200%		100%	200%
All Products		50%	133%		33%	100%		20%	67%

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Table 3
Indices of Total Production Using Fixed Prices of Alternative Years

	Index			Growth	
	1983	1993	2000	1993	2000
Numeraire: 1983=100					
Fixed prices of 1983	100.0	150.0	350.0	50%	133%
Fixed prices of 1993	100.0	133.3	266.7	33%	100%
Fixed prices of 2000	100.0	120.0	200.0	20%	67%
Numeraire: 1993=100					
Fixed prices of 1983	66.7	100.0	233.3	50%	133%
Fixed prices of 1993	75.0	100.0	200.0	33%	100%
Fixed prices of 2000	83.3	100.0	166.7	20%	67%
Numeraire: 2000=100					
Fixed prices of 1983	28.6	42.9	100.0	50%	133%
Fixed prices of 1993	37.5	50.0	100.0	33%	100%
Fixed prices of 2000	50.0	60.0	100.0	20%	67%

Note in particular the following:

- a. While for individual commodities with relatively homogeneous and identifiable units (rice and computers in this example) using the fixed prices of any year gives the same implied growth rate (0% for rice in both periods and 100% and 200% for computers in 1983-1993 and 1993-2000 respectively, see Table 2), in computing aggregate production the choice of year for fixed prices makes a substantial difference. Using 1983 prices, growth in aggregate production was 50% between 1983 and 1993 and 133% between 1993 and 2000, using 1993 prices it was 33% and 100%, and using 2000 prices it was 20% and 67%.
- b. If a fixed weight index of production is constructed to track growth in quantities (as is done in Table 3), different widely behaving series result depending on the choice of weighting year. But the choice of a numeraire year make absolutely no difference (note that the implied growth rates for different weighting years are the same under all numeraire years).

Which story should we then believe? The one using as a weighting year 1983 (growth between 1983 and 1993 was 50% and that between 1993 and 2000 was 133%) or 1993 (1983-1993 growth was only 33% and that of 1993-2000 was 100%) or 2000 (1983-1993 growth was

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only 20% and that of 1993-2000 was only 67%)? Clearly the implication for each scenario is very different. If we believe one particular story, e.g. that of 1983 as a weighting year, then the natural corollary is: what was so special about that year that we need to continue to value everything in the future at their value in that year?

These were the types of questions that analysts and national accountants have been wrestling with in the past two decades. From an economist's point of view, none of the above three scenarios is satisfactory. Since an economist's primary interest is in measuring the growth in the economy between two particular periods: the best way to value growth between 1983 and 1993 is at prices prevailing in those years (e.g. 1983 or 1993 or both); similarly, the best way to value growth between 1993 and 2000 is at prices prevailing in 1993 or 2000 or both. Hence, a superior indexing procedure to those presented in Table 3 would produce a real growth rate from 1983 to 1993 of 50% (based on prices of 1983) and from 1993 to 2000 of 100% (based on prices of 1993). These can be obtained by using a chain index with two links in it, an 1983-93 link and a 1993-2000 link. A chain index with more links in it--for example, an index with a new set of weights each year--would give still different growth rates.

III. CHAINING

The use of fixed-weight measures became widespread because such measures were simple to understand and easy to interpret. Their biggest drawback, namely that real growth depends on the choice of weighting year, became more serious in the 1980s and 1990s. When all prices in a particular economy move more or less consistently over time, the problem of a weighting year is reduced, but when relative prices change drastically, as in our example in Table 1,² fixed weights produce the type of problem indicated in the previous section. One way to mitigate such a problem is to regularly (e.g. every 5 or 10 years) move the weighting year forward. That has been the standard international practice in the past decades. However, changes in the structure of economies were occurring faster since the 1980s than could be captured by occasional reweighting. The recommended solution became to reweight every year instead of once every 5 or 10 years. That is the essence of the "chaining" methodology recommended by the 1993 SNA.

² Or when a significant substitution effect occurs between commodities as a result of significant relative price changes. This is referred to as the "substitution bias", which is caused by the fact that quantities for commodities with declining relative prices tend to grow much faster than those of other commodities.

A. What is It?

Table 4 provides an example of chaining using a Laspeyres index of production.³ In other words, quantities produced in 1993 are priced at their level in 1983, and quantities in 2000 are priced at their level in 1993. That way, the implied growth in the aggregate index reflects the weights in the latest available year, rather than a fixed past year. As was done in Table 3, alternative numeraire years are used which make no difference in the implied growth rates.

**Table 4
Chained Laspeyres Index of Total Production**

	Index			Growth	
	1983	1993	2000	1993	2000
Nomeraire 1983=100	100.0	150.0	300.0	50%	100%
Nomeraire 1993=100	66.7	100.0	200.0	50%	100%
Nomeraire 2000=100	33.3	50.0	100.0	50%	100%

B. Advantages

The use of chained measures provides substantial conceptual advantages:

- a. **More realistic real growth measure between consecutive periods:** By using updated weights in comparing two consecutive periods, these measures reflect more realistically real growth between the two periods than any measure using fixed weights (of one or even two periods).⁴ The more acute the change in relative prices the higher the difference between results using updated (i.e. changing) weights and fixed weights.
- b. **More accurate long-term comparisons:** By using weights which reflect more realistically conditions prevailing in various years, comparisons of a particular series over the long run become more accurate than by using fixed weights.
- c. **No more breaks in series:** The problem of apparent changes in growth rates resulting from changing weighting periods (when fixed weights are used) would disappear since weights are updated every year.

³ The Laspeyres indexing formula is used here for illustration. Alternative formulas (Paasche, Fisher, Tornqvist etc.) can be equally used.

⁴ Chain indexes are more realistic because they weight transactions at the prices and costs actually prevailing when they took place.

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- d. **Smaller differences between alternative index formulas:** The differences between alternative indexing formulas tend to be smaller, giving statistical agencies more flexibility in their choice of formulas.

C. Disadvantages

The above advantages are certainly significant. However, chain indices also have three drawbacks, one minor, one significant and one somewhere in between (i.e. it is generally minor but has the potential to be significant if not used properly):

- a. **Require more data:** The first drawback is that they require more data than fixed weight series. Relevant price as well as quantity data need to be available every year if one is to use current weights for commodities.
- b. **Non-additivity:** The most significant drawback, however, is that chained series are not additive. That is, if one derives a chained real (monetary) measure, the chained aggregate measure is not necessarily equal to the sum of the chained component measures. This issue is serious and potentially the most confusing to users, and therefore warrants further discussion. Using the data from Table 1, we have attempted to illustrate non-additivity in Table 5 below.

**Table 5
Nominal vs Real Production Using Chain-Linked Aggregates**

Product	Nominal (bn Rp)			Real								
				Bn Chained 1983 Rp			Bn Chained 1993 Rp			Bn Chained 2000 Rp		
	1983	1993	2000	1983	1993	2000	1983	1993	2000	1983	1993	2000
Rice	50	50	50	50	50	50	50	50	50	50	50	50
Computers	50	50	75	50	100	300	25	50	150	13	25	75
All Products	100	100	125	100	150	300	67	100	200	42	63	125
Component Total	100	100	125	100	150	350	75	100	200	63	75	125
Growth												
Rice		0%	0%		0%	0%		0%	0%		0%	0%
Computers		0%	50%		100%	200%		100%	200%		100%	200%
All Products		0%	25%		50%	100%		50%	100%		50%	100%
Component Total		0%	25%		50%	133%		33%	100%		20%	67%

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The aggregate level of nominal production in any one year is the sum total of the level of nominal production of individual components: that is, the 1993 level of Rp. 100 billion is the total of the value of production (in 1993 rp) of the two commodities produced. However, the aggregate level of “real” production in 2000, for example, is not necessarily equal to the sum of “real” production of its components. If we use 1983 as a numeraire year, i.e. if we choose to make the nominal and real values in that year the same, then the “real” aggregate level (computed by applying the cumulative growth rates of 1993 and 2000) is Rp. 300 billion whereas the sum of the real value of the components is Rp. 350 billion. Different *levels* and varying degrees of inconsistency between the aggregate and the components are obtained using different years as numeraire.

This non-additivity is an inconvenient consequence of having to use changing weights. It is usually not apparent if one only calculates growth rates, but is obvious if we calculate “real” monetary levels. If one uses “real” levels, one has to interpret their meaning very carefully. A “real chained 1983 rp” level, for example, cannot be interpreted as the production level valued at prices prevailing in 1983 (as was the case with the fixed weight series), but rather as “chained production in the current year using nominal production of 1983 as a numeraire.” And there is no simple way to define “chained production”. In the case of a “Laspeyres-chained production” in year t , it is the cumulative production in year t where production in any particular year was valued at prices prevailing in the previous year.

A consequence of non-additivity is that it will be no longer possible to derive directly from the published data the contribution to growth of any particular sector (or sub-sector). Such contributions can still be calculated, but they would require the use of data at a lower level of disaggregation than provided in standard publications.

- c. **Drift:** A third drawback, although not as serious as the second one above, is that a chained series tends to “drift” away from what a true measure should indicate. Table 6 provides an example. Suppose that the basic data for 1983 and 1993 are the same as those used above, but that in 2000, instead of having the 1983-1993 trend for computers continue, the trend reverses course and produces the same data as in 1983, namely a price level of 10 and a production of 50.

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Table 6
Illustration of the "Drift" Problem When Chaining

Product	1983			1993			2000		
	Price	Quantity	Value	Price	Quantity	Value	Price	Quantity	Value
Rice	1	50	50	1	50	50	1	50	50
Computers	10	5	50	5	10	50	10	5	50
All Products			100			100			100
Laspeyres Index									
Fixed 1983 prices			100			150			100
Chain			100			150			112.5

A realistic aggregate production index should provide the same index level for 1983 and 2000, since the underlying data for both years are identical. The fixed-based Laspeyres index will do just that (a 50% growth between 1983 and 1993 and a 33% decline between 1993 and 2000, with the index in 2000 at exactly the same level --100-- as in 1983), but the chained one will not. Instead, the chained Laspeyres index will indicate a growth of 50% between 1983 and 1993 but a decline of only 25% between 1993 and 2000 with an index of 112.5 in 2000 compared to 100 in 1983. Such a "drift" in the chained index is caused by the fact that different weights are used in measuring the increase in production (in 1993) than are used in measuring the decrease in 2000.

The drift problem is a serious drawback in theory, since abnormal behavior (such as the change between 1993 and 2000 in the example in Table 6) gets built into a chained index when it probably would be better to leave it out of the weighting scheme. However, in practice it is not because such behavior is not common in annual national accounts data. Annual data tend to move as a trend rather than display sharp oscillations which may cause drifts.

IV. ANNUAL VS QUARTERLY DATA

Quarterly data tend to be more volatile than annual data, since they are subject to seasonal factors, and thus are likely to show severe "drifts" if chained quarterly. That is why the 1993 SNA recommends annual, rather than quarterly, chaining of data. Table 7 provides basic illustrative quarterly data for three consecutive years. In the same two-commodity economy discussed above, the first commodity (rice) faces no change in either quantity produced or price over the three-year period. The second commodity (computers) displays a 12% quarterly increase in quantity and a

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10% quarterly drop in price. How to construct a chained quarterly index of production for the economy? Table 8 provides alternative answers.

Table 7
Illustrative Example of Quarterly Production

Product	1993				1994				1995			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Rice¹⁾												
Quantity	50	50	50	50	50	50	50	50	50	50	50	50
Price	1	1	1	1	1	1	1	1	1	1	1	1
Value	50	50	50	50	50	50	50	50	50	50	50	50
Computers²⁾												
Quantity	5	6	6	7	8	9	10	11	12	14	16	17
Price	10	9	8	7	7	6	5	5	4	4	3	3
Value	50	50	51	51	52	52	52	53	53	54	54	55

- 1) No change in either quantity or price is assumed for this product.
 2) Quantity is assumed to increase by 12% per quarter and price is assumed to decrease by 10% per quarter.

Table 8
Alternative Chained Laspeyres Production Indices

Product	1993				1994				1995				
	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Annual Indices													
Constant 93 prices: 1993=100	100.0				128.8				174.2				
Constant 94 prices: 1994=100					100.0				129.3				
Chain: 1993=100 ¹⁾	100.0				128.8				166.6				
Quarterly Indices with Annual Overlap													
Constant 93 prices: 1993=100	91.8	96.8	102.5	108.8	115.9	123.9	132.8	142.8	153.9	166.4	180.4	196.1	
Constant 94 prices: 1994=100					91.7	96.8	102.5	109.0	116.2	124.3	133.3	143.4	
Chain: 1993=100 ²⁾	91.8	96.8	102.5	108.8	115.9	123.9	132.8	142.8	149.7	160.1	171.8	184.8	
Quarterly Indices with Overlap in Fourth Quarter													
Constant 93 prices: 1993=100	91.8	96.8	102.5	108.8	115.9	123.9	132.8	142.8	153.9	166.4	180.4	196.1	
Constant 94 prices: QIV 94=100									100.0	106.6	114.0	122.3	131.6
Chain: 1993=100 ³⁾	91.8	96.8	102.5	108.8	115.9	123.9	132.8	142.8	152.2	162.8	174.6	187.9	
Implicit Annual Growth													
Chain annual					28.8%				29.3%				
Chain quarterly: annual overlap					28.8%				29.3%				
Chain quarterly: 4 th Q overlap					28.8%				31.5%				

- 1) $128.8 = 100.0 \times (128.8 / 100.0)$
 $166.6 = 128.8 \times (129.3 / 100.0)$
 2) $149.7 = 116.2 \times (128.8 / 100.0)$
 $160.1 = 124.3 \times (128.8 / 100.0)$
 3) $152.2 = 142.8 \times (106.6 / 100.0)$
 $162.8 = 152.2 \times (114.0 / 106.6)$

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Two chained quarterly indices are calculated: one using a one-year overlap (1994) and one using a one-quarter overlap (the fourth quarter of 1994 is chosen arbitrarily in the table).⁵ Calculating a chain index with 1993 as a numeraire year and using a one-year overlap involves the following three steps:

- a. First, a quarterly index at constant 1993 prices is calculated with 1993 values used as a numeraire (first row of the second panel of Table 8).⁶ Note that the average index for 1993 should by necessity equal to the level assigned to the numeraire year (100 in this case).
That forms the 1993-1994 portion of the chain index series. The 1995 portion, to be chained to the 1993-1994 series, requires computation of a quarterly series for 1995 using 1994 as a weighting year.
- b. A quarterly index at constant 1994 prices is calculated with 1994 values as a numeraire (second row of the second panel). Again, note that the average index for the four quarters of 1994 should also equal 100.
- c. Chaining 1995 with the earlier year requires converting the quarterly 1995 indices (which used 1994 as a numeraire year) into indices with 1993 as a numeraire year by using growth in the whole year of 1994 as a link. In other words, the 1995 quarterly indices at constant 1994 prices and with 1994 as a numeraire (in the second panel) are multiplied by the annual growth factor between 1993 and 1994 in the first panel (i.e. the ratio of 128.8 -- the annual index for 1994-- and 100.0 --the annual index for 1993). By the same token, if 1996 quarterly indices were computed (at 1995 constant prices and with 1995 as a numeraire year), they would be chained by multiplying them by the cumulative annual growth achieved through 1995 (i.e. the ratio of 166.6 --the annual chain index for 1995-- and 100.0 --the annual index for 1993).

Calculating a chain index with 1993 as a numeraire year and using a one-quarter (the fourth quarter of 1994 in our example) overlap also involves three steps:

⁵ A third alternative technique, using annual overlaps based on changes from the same period in the previous year (rather than changes in the calendar year), can also be used but is generally not recommended because it may result in distorted seasonal patterns.

⁶ Since 1993 is the first year, we use the average prices for that year to compute quarterly constant price indices for the same year.

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- a. The first step is identical to the first step used in computing indices with a one-year overlap. Note, for example, that the first row of the third panel of Table 8, which demonstrates these calculations, is the same as that of the second panel.
- b. A quarterly index at constant 1994 prices is calculated, but having values in the fourth quarter of 1994, instead of the whole year, as a numeraire (second row of the third panel).
- c. Chaining 1995 with the earlier year in this case starts with the first quarter of 1995: the index for that quarter is calculated by multiplying the index of the fourth quarter of 1994 (third row of the third panel) by the quarterly growth factor using the fourth quarter of 1994 as a numeraire (i.e. by the ratio of 106.6 --the index for quarter I, 1995 with quarter IV, 95 as a numeraire-- and 100.0 --the index for quarter IV, 94). Similar calculations are done for the remaining quarter of 1995. To compute 1996 chained indices, one has to calculate a new quarterly index series for 1996 at constant 1995 prices with the fourth quarter of 1995 as a numeraire. The same logic used for computing the 1995 indices can then be applied.

Which chaining method should be used: the one with a one-year overlap or the one with a one-quarter overlap? Either method can be used, although the one-year overlap method has the advantage of producing indices which show an annual growth equal *exactly* to the growth obtained from computing annual indices (as the fourth panel of Table 8 shows), which is a desirable property in the context of national accounts compilation.

V. OTHER ISSUES

The previous sections established that it is desirable for BPS to begin calculating quarterly (and annual, since these are computed as the sum of the quarterly) national accounts using the chaining methodology recommended by the 1993 SNA. BPS has made the decision to do just that. In attempting to implement this decision, however, a number of further issues have to be addressed: What indexing formula to use for chaining? What format should be used for publication? What level of detail should chaining be applied to?

The sections that follow will attempt to provide answers to these questions. But first, it may be useful to learn how other countries have dealt with these issues. Table 9 shows what a select number of countries (developed as well as developing) are currently publishing.

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Table 9
Present Publication Format of “Real” GDP Measure in Select Countries

Country	“Real” GDP Measure
United States	in Fisher-chained 1996 dollars
Canada	in constant 1992 prices ¹⁾
Australia	in annually Laspeyres-chained index
Netherlands	in constant 1995 prices
United Kingdom	in constant 1995 prices
France	in constant 1995 prices ²⁾
Japan	in constant 1995 prices
India	in constant 1993-94 prices
Singapore	in constant 1990 prices
Malaysia	in constant 1987 prices
South Korea	in constant 1995 prices

Source: websites of various countries’ statistical agencies as of May 4, 2001.

1) Although what is currently published is limited to the series in constant 1992 prices (with a Fisher-chained dollar value series made available to users upon request), Statistics Canada plans to change its policy in 2001. Starting in June 2001, it plans to follow the US lead and publish only Fisher-chained dollar values, but will make available to users upon request for the next 2-3 years the series in constant 1992 prices.

2) Also provides *annual* growth rates in previous year’s prices

The table points to a very interesting conclusion, namely that countries, even developed ones, have not rushed to implement the 1993 SNA recommendations about chaining national accounts.⁷

Among developed countries, only the US and Australia have discontinued publishing fixed-weight constant price series altogether and only publish chained series. Canada produces both fixed weight and chained series, France produces a chained supplemental series only to its fixed-weight annual series. Other European countries produce only fixed weight series in constant 1995 prices. In Asia, no country in the table has produced chained series yet. Their publication to date has been limited to fixed-weight constant price series.

So BPS, by producing only a fixed-weight series in constant 1993 prices, has not been out of step with other countries. In fact, it is currently in line with the majority of countries. That should not be interpreted as a recommendation to drop the chaining methodology altogether. Rather, it should be interpreted as a recommendation to approach this issue with caution in order to minimize potential problems that users may encounter in the future.

⁷ One should note that Table 9 shows what other countries are currently publishing, not what they plan to publish. It is probable that several of these countries are doing what BPS is currently doing, namely evaluating options for future releases.

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A. What Indexing Formula?

In computing a chained volume index series, a number of alternative indexing formulas can be used. The most widely known procedures are Laspeyres (which uses fixed prices of the previous period) and Paasche (which uses fixed prices of the current period); but two others are becoming more common: Fisher (which is the geometric mean of the Laspeyres and Paasche, thus using prices of both periods) and Tornqvist (or Discrete Divisia, which uses the average weights of the two periods).

Let p_{it} be the price of commodity i in period t
 q_{it} the quantity of commodity i in period t , and
 v_{it} the value of commodity i in period t , equal to $p_{it} q_{it}$.

A volume index using the Laspeyres procedure can be expressed as:

$$\frac{\sum_i p_{i,t-1} q_{it}}{\sum_i p_{i,t-1} q_{i,t-1}}$$

Using the Paasche procedure it would be:

$$\frac{\sum_i p_{it} q_{it}}{\sum_i p_{it} q_{i,t-1}}$$

Using the Fisher procedure it would be:

$$\left[\left(\frac{\sum_i p_{i,t-1} q_{it}}{\sum_i p_{i,t-1} q_{i,t-1}} \right) \left(\frac{\sum_i p_{it} q_{it}}{\sum_i p_{it} q_{i,t-1}} \right) \right]^{\frac{1}{2}}$$

Finally, using the Tornqvist procedure, the volume index can be expressed as:

$$\prod_i \left(\frac{q_{it}}{q_{i,t-1}} \right)^{\left(\frac{1}{2} \right) \left(\frac{v_{it}}{\sum_i v_{it}} + \frac{v_{i,t-1}}{\sum_i v_{i,t-1}} \right)}$$

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The advantages and disadvantages of all these procedures are well known and therefore need not be dwelled on in this report.⁸ The difference between alternative procedures would be significant if fixed weights were used for all periods. However, by requiring updated weights between two consecutive periods, chaining reduces substantially such differences. BPS may want to experiment with various procedures and compare results. However, the easiest course of action would be to use the chained Laspeyres procedure, since the fixed-weight Laspeyres procedure was used in the past and both compilers and users of Indonesian national accounts have been used to it for some time.

B. What to Publish?

Based on other countries' experiences (see Table 9), the decision regarding what to make available to users to allow them to measure real GDP growth rates needs to be approached with caution. More specifically, three important questions need to be answered: what data to publish, in what format and what level of detail. The provision of adequate answers to these questions will require lengthy discussions making sure that no stone is left unturned. What follows can hopefully provide a starting point for these discussions.

1. What Data?

The issue here is whether to publish chain volume data or continue to produce GDP at "constant prices" of some fixed year. The greatest advantage of the former, as we have shown above, is that figures would provide a more realistic reflection of the economy. Its biggest drawback is the potential confusion among users which would be due primarily to their lack of familiarity with it. The biggest advantage of continuing to produce "constant price" data is the simplicity of that methodology and users' current familiarity with it. Its biggest drawback is its sensitivity to the arbitrary choice of a weighting year and its potential overstatement of real growth.

One advisable course of action, at least in the short run, is to produce both sets of figures and allow users themselves to choose between the two based on their particular need. Although such an action would be applauded by academics and researchers since it provides them with more information, it may sow confusion with the general public or even among government policy makers: for many there can only be one "true" number that should be believed and should be used for planning and evaluation. One way to resolve this dilemma is for BPS to choose one of the series as the "official" one but to make the other series available to users upon request. That

⁸ One disadvantage of the Fisher and Tornqvist procedures that may not be well known is that measuring the contribution of each component to a percent change in an aggregate is not simple, as it is for the Laspeyres and Paasche procedures. That may provide additional support to the recommendation in this section to use the chained Laspeyres procedure.

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was the approach used by Statistics Canada since 1997.

Which series should then be chosen as the “official” one? Since the chained series cannot be made available to the general public without adequate (and probably pretty lengthy) education, it may be more practical to continue to consider the “constant price” series as the official one until the public is ready to accept the chained series.

2. In What Format?

When BPS deems itself ready to make available to users the chained volume series, in what format should the data be provided? Based on the experience of countries which have adopted this methodology, two options are available:

- The first is to provide the data in terms of growth over the previous period (either in the form of a rate or an index). This option has the big advantage of avoiding the inconvenience of non-additivity, hence lowering the potential of user confusion. Its biggest drawback is that users will not be able to derive from it a long-term historical series.
- The second option is to provide the data in the form of “real” monetary aggregates using some recent year as a numeraire. The advantages and drawbacks of this option are the exact flip side of those of the first option. That is, while it provides the user with a convenient long-term series, it will suffer from the non-additivity problem.

With either options, however, BPS will need to produce a supplementary table with the sectoral contribution to aggregate growth.

3. What Level of Detail

Here again, when BPS deems it advisable to provide chained volume data to users, at what level of detail should chaining be made? Theoretically, it would be desirable to chain at the finest level of detail--every single product. In practice, it will probably be feasible and sufficient to carry it out at a somewhat more aggregate level, perhaps at a more detailed level than the 3-digit ISIC. This remains an issue subject to the level at which data are available and other practical considerations.

VI. CONCLUSIONS & RECOMMENDATIONS

To sum up, we will present the conclusions and recommendations of this report as answers to the following questions:

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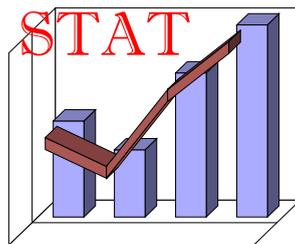
- **Should quarterly national accounts be chained?** The answer is yes.
- **How often should they be chained?** Annually, as recommended by the 1993 SNA.
- **What indexing formula to use?** Laspeyres, since this has been the procedure with which BPS staff (and users) are most familiar. Other indexing procedures can be adopted, but one must weigh the cost of introducing a new procedure against the potential benefits, which will not be substantial if data are annually chained.
- **What should BPS publish?** The easiest course of action would be to continue to provide a “constant price” series as the official one, but at the same time making available to users upon request a chained series for the same period. In any case, it is imperative to ensure that a campaign is conducted by BPS aiming at educating users about the chaining methodology and the way numbers should be interpreted. Evaluation of user reaction over the next couple of years can then determine whether the chaining methodology has been fully absorbed and endorsed by users, thus determining whether a switch to exclusive publication of a chained series is advisable.
- **What format to use for publication?** Both options (growth rates and “real” monetary levels) are appropriate. However, the first option has the advantage of avoiding the non-additivity problem in the presentation of numbers, since users already know that growth rates are not additive.

MEASURING OPEN UNEMPLOYMENT IN SAKERNAS

Report # 35
Statistical Paper # 8

by
**Uzair Suhaimi
Yahya Jammal**

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Measuring Open Unemployment in SAKERNAS

I. INTRODUCTION

In an earlier report,¹ Vijay Verma evaluated the definitions used by BPS for the terms “employed” and “unemployed” in the context of the standard international (i.e. International Labor Organization, ILO) concepts. He concluded that while the definition of “employed” conformed to that of the ILO, the definition of “unemployed” did not. He further suggested that some empirical investigation be conducted to measure the implication of adopting a relaxed ILO definition of “unemployed”. This brief paper documents an empirical evaluation of adopting this concept. The 1996-2000 Sakernas results were used. Our analysis covers four sections: the first includes measurement of the “employed”, the second that of the “unemployed”, the third provides a comparative analysis of the results using alternative measurements and the final section provides our brief concluding remarks.

II. EMPLOYMENT

Sakernas asks the following questions to determine the working status of a particular member of the household.²

1. Question 2.a: “What were your activities during the previous week?” (“Apakah melakukan kegiatan seperti di bawah ini selama seminggu yang lalu?”). Four categories are provided, with the answer expected to be a “yes” or a “no”:
 - Working
 - Attending school
 - House keeping
 - Other

This allows estimation of the number of people engaged in each activity (note that one person could be counted more than once).

2. Question 2.b: to identify the main activity, the household member is asked “From those activities to which you have answered “yes”, which one did you spend the most time on during the previous week?” (“Dari pertanyaan yang menyatakan “YA” di atas, kegiatan apakah yang menggunakan waktu terbanyak selama seminggu yang lalu?”). Those who say that “working” was their activity will, of course, be classified as employed and are expected to provide answers to further questions. Those who do not will be subjected to further filtering to determine whether they can be

¹ *Selected Issues in Labor Force Statistics*, STAT Project Report #25, March, 2001.

² Question number refers to the code used in the 2000 questionnaire (see Appendix A). Other years have the same question but the code may be different.

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classified as employed in the broader definition of the ILO, namely if they have worked for at least one hour.

3. Question 3: "Did you work at least one hour during the previous week?" ("Apakah bekerja paling sedikit 1 jam selama seminggu yang lalu?"). If the answer is "yes" then they will be considered employed as in paragraph 2 and will be subjected to the same questions as those previously considered as employed.
4. Question 4: "Did you have a job but were temporarily not working during the previous week?" ("Apakah mempunyai pekerjaan/usaha, tetapi sementara tidak bekerja selama seminggu yang lalu?"). If the answer is "yes" then they will be considered employed as in paragraphs 2 and 3, and will be subjected to the same questions as those previously considered as employed.

Thus, according to the BPS definition of "employed", which is the same as that of the broad definition of the ILO, total employment equals the sum of those considered "employed" in paragraphs 2, 3 and 4 above.³

III. UNEMPLOYMENT

While BPS measurement of employment is generally consistent with the standard ILO definition, measurement of unemployment raises some questions. The current BPS definition of "unemployed" is based on the answer to only one question (Question 5: "Are you looking for a job?" --"Apakah sedang mencari pekerjaan?"). If the answer is "yes" then the respondent is considered unemployed. This question was designed by BPS in an attempt to follow the standard ILO definition of "unemployed". However, Verma pointed out that the ILO also allows a relaxation of the "seeking work" criterion. The following paragraphs from the ILO manual sum up the argument very clearly:

"Seeking work is essentially a process of search for information on the labour market. In this sense, it is particularly meaningful as a defining criterion in situations where the bulk of the working population is oriented towards paid employment and where channels

³ Actually, the program computing the number of employed workers includes one further type of respondent: those who were not looking for a job (answer "no" to Question 5: "Are you looking for a job?" --"Apakah sedang mencari pekerjaan?") but stating as the reason for not looking the fact that they already have a job (answer "4" to Question 19: "Main reason for not looking for a job"). These are sometimes referred to as "future starts". However, the 1996-2000 Sakernas surveys did not identify any cases which fulfilled this criterion. Starting with the 2001 Sakernas, BPS will consider future starts as "unemployed", in accordance with the ILO standard definition.

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for the exchange of labour market information exist and are widely used. While in industrialised countries these conditions are largely satisfied ..., this may not be the case in developing countries.

In many developing countries, most workers are self-employed, often in household enterprises. Labour exchanges and similar organisations are not fully developed [That is why] the 1982 international standards introduced a provision which allows for the relaxation of the seeking work criterion in certain situations.”⁴

Verma reported that other questions in the existing questionnaire can be used (individually or collectively) to derive such a relaxed definition of unemployment, which would be more appropriate for Indonesia. These include:

- Question 16: “Type of effort made in looking for a job” (“Upaya apa saja yang pernah dilakukan dalam mencari pekerjaan?”)
- Question 17: “Duration of job search” (“Lamanya mencari pekerjaan”)
- Question 18: “Type of job you are looking for?” (“Pekerjaan yang dicari”)
- Question 19: “Main reason for not looking for a job” (“Alasan utama tidak mencari pekerjaan”)
- Question 20: “If you were offered a job, would you accept it?” (“Jika ada penawaran pekerjaan, apakah mau menerima?”)
- Question 21: “Have you ever worked before?” (“Apakah pernah bekerja sebelumnya?”)

While not all the above questions can, in their present form, be useful in redefining the “unemployed”, one question contains highly relevant information. Question 19, which asks for the main reason why the respondent is not looking for a job, allows the following answers:

1. “I feel that it is not possible for me to find a job” (“Merasa tidak mungkin mendapatkan pekerjaan”)
2. “Attending school” (“Sedang bersekolah”)
3. “Housekeeping” (“Mengurus rumahtangga”)
4. “I already have a job” (“Sudah mempunyai pekerjaan”)
5. “I feel that what I have is enough” (“Merasa sudah cukup”)

⁴ *Surveys of economically active population, employment, unemployment and underemployment: An ILO manual on concepts and methods*, International Labor Office, 1990, p. 107.

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6. “Unable to find a job” (“Tidak mampu melakukan pekerjaan”)
7. “Other, to be specified” (“Lainnya”)

Two of the answers are of particular interest: the fourth and the first. The fourth answer (“I already have a job”), which is generally equivalent to “future starts”, has been addressed in the previous discussion on employment. The first answer describes what is often referred to as a “discouraged worker”.⁵ The reason why the respondent is not looking for a job, and thus not being considered as part of the labor force, is his/her perception that there is no work available for him/her. A relaxed framework would define such a person as unemployed rather than someone outside the civilian labor force.

By including “discouraged workers” in the labor force and considering them as part of the unemployed, the relaxed definition would predictably result in a higher labor force participation rate (since the numerator –labor force– would increase while the denominator –population 15 or older– remains the same) as well as a higher rate of open unemployment (since the relative increase in the numerator –the unemployed– would always be higher than the relative increase in the denominator –labor force). The issue which is worth exploring is how significant these increases are. In other words, would the labor force participation rate and more importantly the open unemployment rate for Indonesia have changed significantly in the past few years if such “discouraged workers” were included with the unemployed? The following sections attempt to answer this question at the national and provincial levels as well as by gender and geographic location.

A. National Level

Table 1 compares the main components used in computing the open unemployment rate using the current and the relaxed definitions. Two points are worth noting:

- a. First, it shows that **using the relaxed definition of open unemployment produces a noticeable increase in the labor force participation rate**. The increase was about 0.4 percentage points in 1996-1998 but climbed to 1.8 and 1.5 percentage points respectively in 1999 and 2000.
- b. Secondly, **the increase in the open unemployment rate is very significant**: increases of 0.5-0.7 percentage points (in absolute

⁵ The sixth answer (“unable to find a job”– “Tidak mampu melakukan pekerjaan”) may appear to the casual reader to refer to discouraged workers as well. However, the Indonesian wording, and the instructions in the operational manual, suggest that this category includes people unable to find a job because of a physical or a mental disability, not because they have been discouraged.

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terms) before 1999 and of 2.4 and 2.1 percentage points respectively in 1999 and 2000 (see also Figures 1 and 2) are produced. These translate into relative increases of about 13% before 1999, and 39% and 34% respectively in 1999 and 2000.

Table 1
Measures of Open Unemployment for Indonesia: Current vs Relaxed Definition¹⁾

	1996	1997	1998	1999	2000
Computations According to Current Definition					
Employed	82,747,193	84,231,997	86,407,683	87,897,736	92,195,453
+ Unemployed	4,228,115	4,135,526	5,011,220	5,985,014	5,965,795
= Labor Force	86,975,308	88,367,523	91,418,903	93,882,750	98,161,248
+ Not in Labor	43,108,652	44,812,508	45,166,026	45,781,085	46,714,478
= Population ≥ 15	130,083,96	133,180,03	136,584,92	139,663,83	144,875,72
L.F. Participation	66.9%	66.4%	66.9%	67.2%	67.8%
Unemployment	4.9%	4.7%	5.5%	6.4%	6.1%
Computations According to Relaxed Definition					
Employed	82,747,193	84,231,997	86,407,683	87,897,736	92,195,453
+ Unemployed	4,761,909	4,787,934	5,711,926	8,524,066	8,183,934
= Labor Force	87,509,102	89,019,931	92,119,609	96,421,802	100,379,38
+ Not in Labor	42,574,858	44,160,100	44,465,320	43,242,033	44,496,339
= Population ≥ 15	130,083,96	133,180,03	136,584,92	139,663,83	144,875,72
L.F. Participation	67.3%	66.8%	67.4%	69.0%	69.3%
Unemployment	5.4%	5.4%	6.2%	8.8%	8.2%

1) Figures were obtained from Sakernas and include all provinces in Indonesia except Maluku (and East Timor, for years prior to 2000). "Current" refers to what appears in current BPS publications. "Relaxed" refers to the inclusion of discouraged workers as unemployed instead of being excluded from the labor force.

Overall then, adding "discouraged workers" to the rank of the openly unemployed makes a significant difference in the unemployment picture of Indonesia during the 1996-2000 period, particularly after the economic crisis. The 1997/98 crisis appears to have resulted in a substantial increase in the number of such workers at the national level.

What about the open unemployment rate by disaggregated categories?

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Figure 1: Unemployment Rate Using Current vs Relaxed Definition

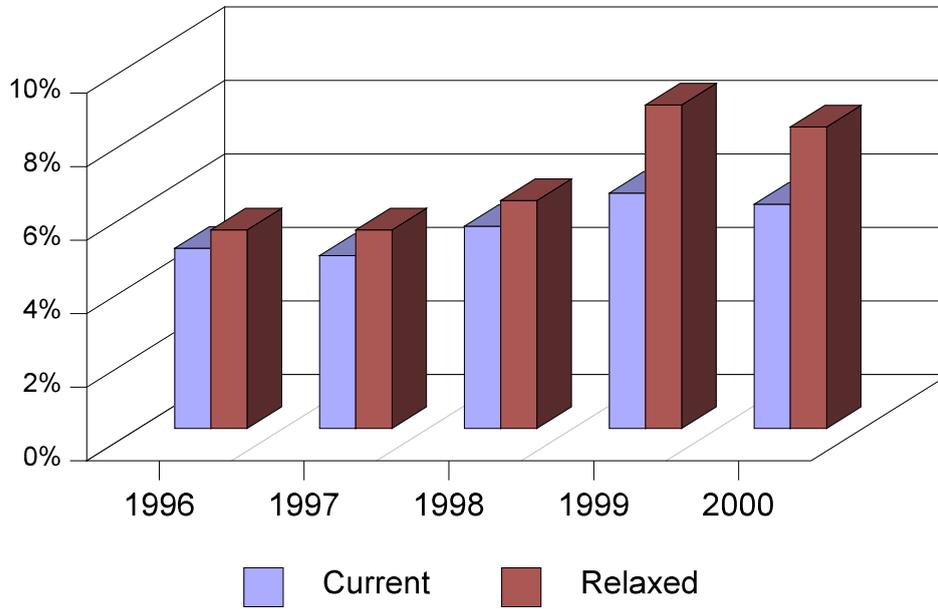
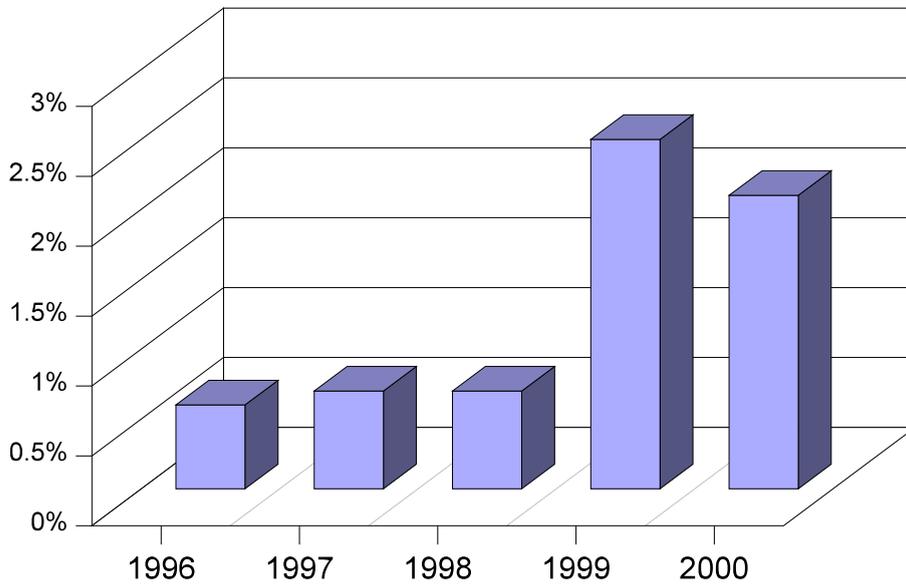


Figure 2: Difference Between Current & Relaxed Measure of Unemployment



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B. Gender And Location

Tables 2 through 5 show the effect of using the relaxed definition of unemployment by gender and location (urban vs rural). Note in particular the following:

- a. **Females are the most affected by changes, particularly after the crisis**, with twice the incidence of males. This effect holds whether one is looking at absolute or relative increases. In absolute terms, female unemployment rates increase by 3.8 and 2.9 percentage points in 1999 and 2000 respectively compared to an average of 1 point before 1999 (Table 4). But these correspond to relative increases of 55% and 44% in 1999 and 2000 respectively (Table 5). By contrast, relative increases for males have been 26% in 1999 and 2000.
- b. **Urban females not only have the highest unemployment rate under the current definition** (averaging 10.1% before 1999 and 10.9% since 1999 –Table 2), **but also have the highest incidence of discouraged workers and thus are the most affected by the change in definition**, whether measured by absolute or relative increase. Their absolute increase averaged 1.2 percentage points before 1999 and 3.6 points since 1999 (Table 4), while their relative increase averaged 11.7% before 1999 and 32.5% since 1999 (Table 5).
- c. On the other hand, **rural males**, who have the lowest unemployment rate under the current definition in every year (Table 2), **are the least affected**, in terms of absolute increase, by the change in definition (Table 4). In terms of relative change, however, urban males have been the least affected (Table 5), since their unemployment rates have been about 2.5 times that of rural males.

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Table 2
Open Unemployment Rate Using Current Definition¹⁾

	1996	1997	1998	1999	2000
Urban					
Male	7.1%	7.1%	8.6%	10.0%	8.5%
Female	10.3%	9.6%	10.5%	11.3%	10.4%
Male + Female	8.3%	8.0%	9.3%	10.5%	9.2%
Rural					
Male	2.6%	2.4%	3.0%	3.6%	3.8%
Female	3.8%	3.6%	3.9%	4.3%	4.5%
Male + Female	3.1%	2.8%	3.3%	3.9%	4.1%
Urban + Rural					
Male	4.2%	4.1%	5.1%	6.1%	5.7%
Female	5.9%	5.6%	6.1%	6.9%	6.7%
Male + Female	4.9%	4.7%	5.5%	6.4%	6.1%

1) Figures were obtained from Sakernas and include all provinces in Indonesia except Maluku (and East Timor, for years prior to 2000).

Table 3
Open Unemployment Rate Using Relaxed Definition¹⁾

	1996	1997	1998	1999	2000
Urban					
Male	7.6%	7.6%	9.4%	12.0%	10.3%
Female	11.4%	11.0%	11.6%	15.4%	13.5%
Male + Female	9.0%	8.8%	10.2%	13.3%	11.5%
Rural					
Male	2.9%	2.7%	3.5%	4.9%	5.1%
Female	4.7%	4.7%	4.6%	7.9%	7.4%
Male + Female	3.6%	3.4%	3.9%	6.1%	6.0%
Urban + Rural					
Male	4.6%	4.5%	5.7%	7.7%	7.2%
Female	6.8%	6.8%	7.0%	10.7%	9.7%
Male + Female	5.4%	5.4%	6.2%	8.8%	8.2%

1) Figures were obtained from Sakernas and include all provinces in Indonesia except Maluku (and East Timor, for years prior to 2000).

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Table 4
Increase in Open Unemployment Rate Between Current and Relaxed Definition

	1996	1997	1998	1999	2000
Urban					
Male	0.42%	0.50%	0.78%	2.03%	1.79%
Female	1.12%	1.39%	1.07%	4.11%	3.06%
Male + Female	0.68%	0.83%	0.89%	2.82%	2.27%
Rural					
Male	0.29%	0.29%	0.52%	1.30%	1.29%
Female	0.88%	1.11%	0.75%	3.60%	2.86%
Male + Female	0.53%	0.62%	0.61%	2.22%	1.93%
Urban + Rural					
Male	0.34%	0.37%	0.62%	1.60%	1.51%
Female	0.96%	1.21%	0.87%	3.81%	2.94%
Male + Female	0.58%	0.70%	0.72%	2.47%	2.07%

Source: Tables 2 and 3.

Table 5
Ratio of Increase in Open Unemployment Rate Over Rate Using Current Definition

	1996	1997	1998	1999	2000
Urban					
Male	0.06	0.07	0.09	0.20	0.21
Female	0.11	0.14	0.10	0.36	0.29
Male + Female	0.08	0.10	0.10	0.27	0.25
Rural					
Male	0.11	0.12	0.17	0.36	0.34
Female	0.23	0.31	0.19	0.84	0.64
Male + Female	0.17	0.22	0.18	0.57	0.47
Urban + Rural					
Male	0.08	0.09	0.12	0.26	0.26
Female	0.16	0.22	0.14	0.55	0.44
Male + Female	0.12	0.15	0.13	0.39	0.34

Source: Tables 2 and 4.

C. Provincial Level

In evaluating the impact of the change in definition on provincial figures, one important point needs to be kept in mind, that is the impact of sample size. While Sakernas samples before the crisis averaged about 65,000 households, post-crisis samples shrank significantly due to severe budget constraints: The 1998 sample covered 49,000 households and that of 1999 covered 48,000 households. The 2000 sample covered even less (42,000 households) and provincial representation was dropped altogether in that year. Thus while one needs to be cautious about

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making historical comparisons at the provincial level (because of the increased sampling error in 1998 and 1999), comparisons between “current” and “relaxed” definitions for the same year remain valid for all years. Table 6 does that for every year. In addition, Tables 7 and 8 compare the average unemployment rate during the 1996-1999 period by province using the current and the relaxed definitions. Table 7 sorts provinces by declining absolute increase and Table 8 sorts them by declining relative increase.

Table 6
Open Unemployment Rate By Province: Current vs Relaxed Definition¹⁾

Province	1996		1997		1998		1999	
	Current	Relaxed	Current	Relaxed	Current	Relaxed	Current	Relaxed
DI Aceh	6.5%	6.7%	5.2%	5.7%	6.2%	7.2%	7.6%	12.7%
Sumatera Utara	6.3%	6.7%	5.2%	5.9%	7.1%	7.6%	7.7%	10.4%
Sumatera Barat	4.7%	5.8%	4.5%	6.2%	5.1%	6.4%	5.9%	9.9%
Riau	5.9%	6.5%	5.9%	6.4%	5.8%	6.0%	7.6%	10.8%
Jambi	3.8%	4.1%	4.1%	4.3%	2.6%	2.9%	3.5%	5.9%
Sumatera Selatan	4.0%	4.6%	4.1%	7.7%	2.4%	2.8%	5.0%	8.0%
Bengkulu	3.4%	3.5%	3.4%	3.6%	2.0%	2.5%	3.4%	5.5%
Lampung	4.2%	4.5%	3.4%	4.2%	4.3%	4.8%	4.6%	7.0%
DKI Jakarta	9.4%	10.5%	10.9%	11.6%	12.3%	13.3%	15.0%	18.1%
Jawa Barat	6.7%	7.5%	6.4%	7.1%	7.7%	8.8%	9.8%	13.1%
Jawa Tengah	3.7%	4.2%	3.9%	4.3%	5.1%	5.6%	4.4%	5.7%
DI Yogyakarta	4.1%	4.7%	4.0%	4.7%	3.7%	4.2%	3.7%	5.1%
Jawa Timur	3.5%	3.9%	3.3%	3.7%	4.1%	4.6%	5.0%	6.8%
Bali	2.7%	3.1%	2.6%	2.9%	3.1%	3.4%	2.5%	3.2%
NTB	2.6%	3.3%	1.7%	2.4%	3.1%	3.4%	1.4%	2.8%
NTT	2.2%	2.8%	2.4%	2.7%	2.6%	3.1%	2.9%	3.0%
Kalimantan	3.4%	4.4%	3.6%	3.8%	3.7%	4.0%	2.0%	3.1%
Kalimantan	3.0%	3.4%	4.0%	4.6%	4.5%	5.4%	3.7%	5.4%
Kalimantan	3.3%	3.5%	2.8%	3.3%	4.2%	4.7%	2.4%	4.4%
Kalimantan	7.6%	7.9%	6.9%	7.7%	8.5%	9.5%	11.0%	14.6%
Sulawesi Utara	9.2%	9.8%	8.0%	9.2%	5.5%	6.9%	7.8%	10.3%
Sulawesi Tengah	4.8%	4.9%	3.8%	4.2%	5.0%	5.4%	4.4%	5.8%
Sulawesi Selatan	5.3%	5.9%	4.5%	6.1%	5.3%	6.6%	6.5%	11.7%
Sulawesi	3.7%	3.8%	2.5%	3.2%	2.6%	3.5%	4.4%	7.6%
Irian Jaya	4.0%	4.4%	3.4%	4.1%	3.2%	4.1%	6.4%	7.8%
Total	4.9%	5.4%	4.7%	5.4%	5.5%	6.2%	6.4%	8.8%

1) No figures are available for 2000 because the Sakernas sample was too small for provincial representation. It was designed only for national representation (covering 42,000 households). Pre-2000 figures do not cover the same sample size: the sample size for 1996 and 1997 covered 65,000 households, the 1998 sample covered 49,000 households and the 1999 sample 48,000 households.

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Table 7
Average Open Unemployment Rate 1996-1999: Current vs Relaxed Definition
Sorted by Absolute Increase

Province	Rate		Increase	
	Current	Relaxed	Absolut	Relativ
Sulawesi Selatan	5.4%	7.6%	2.2%	0.40
Sumatera Barat	5.1%	7.1%	2.0%	0.40
Sumatera Selatan	3.9%	5.8%	1.9%	0.49
DI Aceh	6.4%	8.1%	1.7%	0.27
Jawa Barat	7.7%	9.1%	1.5%	0.19
DKI Jakarta	11.9%	13.4%	1.5%	0.12
Sulawesi Utara	7.6%	9.1%	1.4%	0.19
Kalimantan Timur	8.5%	9.9%	1.4%	0.17
Sulawesi Tenggara	3.3%	4.5%	1.2%	0.37
Riau	6.3%	7.4%	1.1%	0.18
Sumatera Utara	6.6%	7.7%	1.1%	0.16
Lampung	4.1%	5.1%	1.0%	0.24
Kalimantan Tengah	3.8%	4.7%	0.9%	0.24
Irian Jaya	4.3%	5.1%	0.9%	0.20
Kalimantan Selatan	3.2%	4.0%	0.8%	0.25
DI Yogyakarta	3.9%	4.7%	0.8%	0.21
Jambi	3.5%	4.3%	0.8%	0.23
NTB	2.2%	3.0%	0.8%	0.35
Jawa Timur	4.0%	4.8%	0.8%	0.19
Bengkulu	3.1%	3.8%	0.7%	0.24
Jawa Tengah	4.3%	5.0%	0.7%	0.16
Kalimantan Barat	3.2%	3.8%	0.7%	0.20
Sulawesi Tengah	4.5%	5.1%	0.6%	0.13
Bali	2.7%	3.2%	0.4%	0.15
NTT	2.5%	2.9%	0.4%	0.15
Total	5.4%	6.4%	1.0%	0.19

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Table 8
Average Open Unemployment Rate 1996-1999: Current vs Relaxed Definition
Sorted by Relative Increase

Province	Rate		Increase	
	Current	Relaxed	Absolut	Relativ
Sumatera Selatan	3.9%	5.8%	1.9%	0.49
Sulawesi Selatan	5.4%	7.6%	2.2%	0.40
Sumatera Barat	5.1%	7.1%	2.0%	0.40
Sulawesi Tenggara	3.3%	4.5%	1.2%	0.37
NTB	2.2%	3.0%	0.8%	0.35
DI Aceh	6.4%	8.1%	1.7%	0.27
Kalimantan Selatan	3.2%	4.0%	0.8%	0.25
Lampung	4.1%	5.1%	1.0%	0.24
Bengkulu	3.1%	3.8%	0.7%	0.24
Kalimantan Tengah	3.8%	4.7%	0.9%	0.24
Jambi	3.5%	4.3%	0.8%	0.23
DI Yogyakarta	3.9%	4.7%	0.8%	0.21
Kalimantan Barat	3.2%	3.8%	0.7%	0.20
Irian Jaya	4.3%	5.1%	0.9%	0.20
Jawa Timur	4.0%	4.8%	0.8%	0.19
Jawa Barat	7.7%	9.1%	1.5%	0.19
Sulawesi Utara	7.6%	9.1%	1.4%	0.19
Riau	6.3%	7.4%	1.1%	0.18
Kalimantan Timur	8.5%	9.9%	1.4%	0.17
Sumatera Utara	6.6%	7.7%	1.1%	0.16
Jawa Tengah	4.3%	5.0%	0.7%	0.16
Bali	2.7%	3.2%	0.4%	0.15
NTT	2.5%	2.9%	0.4%	0.15
Sulawesi Tengah	4.5%	5.1%	0.6%	0.13
DKI Jakarta	11.9%	13.4%	1.5%	0.12
Total	5.4%	6.4%	1.0%	0.19

The following points are noteworthy:

- a. While the impact of the change in definition may understandably be different for provinces from year to year, **the absolute impact on one province (West Sumatera) has been consistently significantly higher than the national average: 82%, 135%, 84% and 62% respectively between 1996 and 1999.**⁶ By contrast, six provinces (Bengkulu, Central Java, East Java, Bali, South Kalimantan and South Sulawesi) show an absolute impact consistently lower than the national average.

⁶ DKI Jakarta and West Java show the same behavior in all years except 1997.

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- b. **South Sulawesi bore the largest impact of the change in definition** over the 1996-1999 period. It had the largest absolute impact (an increase of 2.2 percentage points in the level of its unemployment rate --Table 7) and the second largest relative impact (a 40% increase --Table 8) among provinces.
- c. **The impact of the change in definition on DKI Jakarta**, which registered the highest average unemployment rate under the current definition (exceeding twice the national rate --Table 6), **was still one of the highest in the nation** in absolute terms (an increase of 1.5 percentage points --Table 7) but the lowest in relative terms (Table 8).

IV. CONCLUSIONS

“Discouraged workers” represent a significant phenomenon in Indonesia, particularly since the 1997/98 crisis. Treating them as part of the unemployed in the civilian labor force makes a substantial difference not only nationally, but by gender, urban/rural location and province as well. If one were to use the relaxed ILO definition, which considers them as unemployed rather than outside the civilian labor force, then the open unemployment rate in Indonesia would have been about 0.7 percentage points higher in absolute terms than the official rate prior to 1999 and over 2 percentage points higher since 1999. In relative terms, it would have been 12%-15% before 1999 and over 34% since 1999. The unemployment rate among the worst affected group (urban females) would have been 1-1.4 percentage points higher in absolute terms (and 11%-14% in relative terms) than the official rate prior to 1999 and over 3 percentage points higher (and over 29% higher in relative terms) since 1999. These numbers make a strong case for adopting the relaxed ILO definition of open unemployment.⁷

⁷

While this paper has demonstrated that the current official BPS open unemployment rate understates unemployment measured according to the relaxed ILO definition, one should point out that the exclusion in Sakernas of another variable may result in over-estimating unemployment. To be classified as unemployed, as Verma argues in his report (*Ibid.*, p. 9), a person has to be “available” for work. Sakernas does not ask this question explicitly. Instead, it enquires about the person’s “willingness” to take a job (Question 20: “If you were offered a job, would you accept it?”). Had “availability” been explicitly measured in Sakernas, the result may have been a lower unemployment rate than the current official figure.

APPENDIX A
SAKERNAS 2000 QUESTIONNAIRE



SAK2000.AK
Dibuat satu set
Untuk BPS

BPS

SURVEI ANGKATAN KERJA NASIONAL 2000

KETERANGAN RUMAHTANGGA

RAHASIA

I. PENGENALAN TEMPAT			
1	Propinsi		<input type="text"/>
2	Kabupaten/Kotamadya *)		<input type="text"/>
3	Kecamatan		
4	Desa/Kelurahan *)		
5	Klasifikasi Desa/Kelurahan	Perkotaan - 1 Pedesaan - 2	<input type="checkbox"/>
6	Nomor Wilayah Pencacahan		
7	Nomor Kelompok Segmen		
8	Nomor Segmen		
9	Nomor Kode Sampel SAKERNAS		<input type="text"/>
10	Nomor Urut Rumah tangga Sampel		<input type="text"/>
11	Nama Kepala Rumah tangga		
12	Jumlah Anggota Rumah tangga		<input type="text"/>
13	Jumlah Anggota Rumah tangga Berumur 10 Tahun ke Atas		<input type="text"/>

II. KETERANGAN PENCACAHAN					
1	Nama dan NIP/NMS Pencacah :	<input type="text"/>	4	Nama dan NIP Pengawas/Pemeriksa :	<input type="text"/>
2	Tanggal Pencacahan :		5	Tanggal Pengawasan/Pemeriksaan :	
3	Tanda Tangan :		6	Tanda Tangan :	

*) Coret yang tidak perlu

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IV. KETERANGAN ANGGOTA RUMAH TANGGA BERUMUR 10 TAHUN KE ATAS																																							
Nama: No. urut art: <input style="width: 20px; height: 15px;" type="text"/>	R.6 s.d R.14 HANYA UNTUK ART YANG BEKERJA (R.2b=1 atau R.3=1 atau R.4=1)																																						
A. PENDIDIKAN																																							
1a. Pendidikan tertinggi yang ditamatkan. <table style="width: 100%; border: none;"> <tr> <td>Tdk/belum pernah sekolah</td> <td>1</td> <td>SLTA Umum</td> <td>6</td> <td rowspan="5" style="font-size: 3em; vertical-align: middle; padding-left: 10px;">}</td> <td rowspan="5" style="vertical-align: middle;">R.1b</td> </tr> <tr> <td>Tdk/belum tamat SD</td> <td>2</td> <td>SLTA Kejuruan</td> <td>7</td> </tr> <tr> <td>SD</td> <td>3</td> <td>Diploma I/II</td> <td>8</td> </tr> <tr> <td>SLTP Umum</td> <td>4</td> <td>Akademi/D.III</td> <td>9</td> </tr> <tr> <td>SLTP Kejuruan</td> <td>5</td> <td>Universitas/D.IV</td> <td>0</td> </tr> </table>	Tdk/belum pernah sekolah	1	SLTA Umum	6	}	R.1b	Tdk/belum tamat SD	2	SLTA Kejuruan	7	SD	3	Diploma I/II	8	SLTP Umum	4	Akademi/D.III	9	SLTP Kejuruan	5	Universitas/D.IV	0	6. Jumlah jam kerja dari seluruh pekerjaan setiap hari selama seminggu yang lalu: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>Sen</th> <th>Sel</th> <th>Rab</th> <th>Kam</th> <th>Jum</th> <th>Sab</th> <th>Ming</th> <th>Jumlah</th> </tr> <tr> <td style="width: 30px; height: 25px;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="width: 30px; height: 25px;"></td> </tr> </table>	Sen	Sel	Rab	Kam	Jum	Sab	Ming	Jumlah								
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SLTP Kejuruan	5	Universitas/D.IV	0																																				
Sen	Sel	Rab	Kam	Jum	Sab	Ming	Jumlah																																
B. KEGIATAN SEMINGGU YANG LALU																																							
2a. Apakah melakukan kegiatan seperti di bawah ini selama seminggu yang lalu? <table style="width: 100%; border: none;"> <tr> <td></td> <td style="text-align: center;">Ya</td> <td style="text-align: center;">Tidak</td> </tr> <tr> <td>1. Bekerja</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>2. Sekolah</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>3. Mengurus rumah tangga</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td>4. Lainnya</td> <td style="text-align: center;">①</td> <td style="text-align: center;">2</td> </tr> </table>		Ya	Tidak	1. Bekerja	1	2	2. Sekolah	1	2	3. Mengurus rumah tangga	1	2	4. Lainnya	①	2	7. Lapangan usaha/pekerjaan tempat bekerja/perusahaan/kantor dari pekerjaan utama selama seminggu yang lalu: <i>(Tulis selengkap-lengkapya)</i>																							
	Ya	Tidak																																					
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2. Sekolah	1	2																																					
3. Mengurus rumah tangga	1	2																																					
4. Lainnya	①	2																																					
C. PEKERJAAN UTAMA																																							
b. Jurusan pendidikan: 	8. Jenis pekerjaan/jabatan dari pekerjaan utama selama seminggu yang lalu: <i>(Tulis selengkap-lengkapya)</i>																																						
3. Apakah bekerja paling sedikit 1 jam selama seminggu yang lalu? (Jika R.2a.1 = 1, Ingkari kode 1) Ya 1 → R.5 Tidak 2	9. Jumlah jam kerja pada pekerjaan utama selama seminggu yang lalu: jam																																						
4. Apakah mempunyai pekerjaan/usaha, tetapi sementara tidak bekerja selama seminggu yang lalu? Ya 1 Tidak 2	10. Status pekerjaan utama selama seminggu yang lalu. <table style="width: 100%; border: none;"> <tr> <td>Berusaha sendiri</td> <td style="text-align: center;">1</td> <td rowspan="5" style="font-size: 3em; vertical-align: middle; padding-left: 10px;">}</td> <td rowspan="5" style="vertical-align: middle;">R.12</td> </tr> <tr> <td>Berusaha dibantu buruh/pekerja tidak tetap/pekerja tak dibayar</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Berusaha dibantu buruh/pekerja tetap dibayar</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Buruh /karyawan /pekerja dibayar</td> <td style="text-align: center;">4</td> </tr> <tr> <td>Pekerja tak dibayar</td> <td style="text-align: center;">5 → R.12</td> </tr> </table>	Berusaha sendiri	1	}	R.12	Berusaha dibantu buruh/pekerja tidak tetap/pekerja tak dibayar	2	Berusaha dibantu buruh/pekerja tetap dibayar	3	Buruh /karyawan /pekerja dibayar	4	Pekerja tak dibayar	5 → R.12																										
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Buruh /karyawan /pekerja dibayar	4																																						
Pekerja tak dibayar	5 → R.12																																						
5. Apakah sedang mencari pekerjaan? Ya 1 Tidak 2	11. a. Berapa upah/gaji bersih yang biasanya diterima selama sebulan dari pekerjaan utama? Upah/gaji berupa uang : Rp. 																																						
	Upah/gaji berupa barang : Rp. 																																						

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11.b. Keadaan sekarang dibandingkan setahun yang lalu.						17. Lamanya mencari pekerjaanbulan <input type="text"/>	
Karakteristik	Lebih baik	Sama baik	Sama buruk	Lebih buruk	Tidak tahu		
1. Pendapatan	4	3	2	1			
2. Fasilitas tempat kerja	4	3	2	1	0		
3. Jaminan kesehatan	4	3	2	1	0		
4. Fasilitas keselamatan kerja	4	3	2	1	0		
5. Fasilitas transportasi	4	3	2	1	0		
6. Keadaan secara keseluruhan	4	3	2	1			
12. Kapan mulai bekerja/berusaha di pekerjaan utama? 31 Juli 1999 dan sebelumnya 1 Setelah 31 Juli 1999 2 → <input type="text"/> <input type="text"/> Bulan Tahun						18. Pekerjaan yang dicari. Pekerjaan penuh waktu (<i>Full time</i>) 1 } R.21 Pekerjaan paruh waktu (<i>Part time</i>) 2 }	
D. PEKERJAAN TAMBAHAN						19. Alasan utama tidak mencari pekerjaan. Merasa tidak mungkin mendapatkan pekerjaan 1 Sedang bersekolah 2 Mengurus rumah tangga 3 Sudah mempunyai pekerjaan 4 Merasa sudah cukup 5 } R.21 Tidak mampu melakukan pekerjaan 6 Lainnya (.....) 7	
13. Apakah selama seminggu yang lalu mempunyai pekerjaan tambahan? Ya 1 Tidak 2 → B.IV.E						20. Jika ada penawaran pekerjaan, apakah masih mau menerima? Ya 1 Tidak 2	
14. Lapangan usaha/pekerjaan tambahan utama: (Tulis selengkapnya-lengkapya) <input type="text"/>						F. PENGALAMAN KERJA	
E. KEGIATAN Mencari PEKERJAAN Lihat R.5, Jika "1" → R.15 Jika "2" → R.19						21. Apakah pernah bekerja sebelumnya? Ya 1 Tidak 2 → STOP	
15. Alasan utama mencari pekerjaan. Tamat sekolah/tidak bersekolah lagi 1 Tanggung jawab mencari nafkah/membantu ekonomi rumah tangga/keluarga 2 Menambah penghasilan 3 Pekerjaan yang ada kurang sesuai 4 PHK/usaha terhenti 5 Lainnya (.....) 6						22. Bila "Ya", apakah berhenti bekerja terjadi setelah 31 Juli 1999? Ya 1 Tidak 2 → STOP	
16. Upaya apa saja yang pernah dilakukan dalam mencari pekerjaan? (Bacakan setiap jawaban) Mendaftar pada bursa kesempatan kerja 1 Menghubungi perusahaan/kantor 2 <input type="text"/> Melalui melalui iklan 4 Menghubungi keluarga/kenalan 8						23. Alasan utama berhenti bekerja/pindah pekerjaan yang terjadi setelah 31 Juli 1999. PHK 1 Tidak ada permintaan/usaha terhenti 2 Pendapatan kurang memuaskan 3 Tidak cocok dengan lingkungan kerja 4 Lainnya (.....) 5	
24. Lapangan usaha/pekerjaan sebelum berhenti bekerja/pindah pekerjaan terakhir: (Tulis selengkapnya-lengkapya) <input type="text"/>						25. Status pekerjaan sebelum berhenti bekerja/pindah pekerjaan terakhir. Berusaha sendiri 1 Berusaha dibantu buruh/pekerja tidak tetap/pekerja tak dibayar 2 Berusaha dibantu buruh/pekerja tetap dibayar 3 Buruh/karyawan/pekerja dibayar 4 Pekerja tak dibayar 5	

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IV. KETERANGAN ANGGOTA RUMAH TANGGA BERUMUR 10 TAHUN KE ATAS																																																	
Nama: No. urut art: <input style="width: 20px;" type="text"/>	R.6 s.d R.14 HANYA UNTUK ART YANG BEKERJA (R.2b=1 atau R.3=1 atau R.4=1)																																																
A. PENDIDIKAN																																																	
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B. KEGIATAN SEMINGGU YANG LALU																																																	
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1 → R.5 2 3 4																																																	
3. Apakah bekerja paling sedikit 1 jam selama seminggu yang lalu? (Jika R.2a.1 = 1, lingkari kode 1)																																																	
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C. PEKERJAAN UTAMA																																																	
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11. a. Berapa upah/gaji bersih yang biasanya diterima selama sebulan dari pekerjaan utama?																																																	
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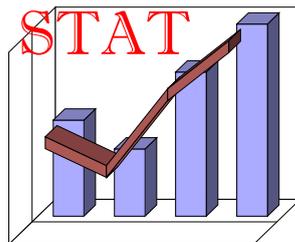
11. b. Keadaan sekarang dibandingkan setahun yang lalu.						17. Lamanya mencari pekerjaan:bulan <input type="text"/>	
Karakteristik	Lebih baik	Sama baik	Sama buruk	Lebih buruk	Tidak tahu		
1. Pendapatan	4	3	2	1			
2. Fasilitas tempat kerja	4	3	2	1	0		
3. Jaminan kesehatan	4	3	2	1	0		
4. Fasilitas keselamatan kerja	4	3	2	1	0		
5. Fasilitas transportasi	4	3	2	1	0		
6. Keadaan secara keseluruhan	4	3	2	1			
12. Kapan mulai bekerja/berusaha di pekerjaan utama? 31 Juli 1999 dan sebelumnya 1 Setelah 31 Juli 1999 2 → <input type="text"/> <input type="text"/> Bulan Tahun						18. Pekerjaan yang dicari. Pekerjaan penuh waktu (<i>Full time</i>) 1 } R.21 Pekerjaan paruh waktu (<i>Part time</i>) 2 }	
D. PEKERJAAN TAMBAHAN						19. Alasan utama tidak mencari pekerjaan. Merasa tidak mungkin mendapatkan pekerjaan 1 Sedang bersekolah 2 Mengurus rumah tangga 3 Sudah mempunyai pekerjaan 4 Merasa sudah cukup 5 } R.21 Tidak mampu melakukan pekerjaan 6 Lainnya (.....) 7	
13. Apakah selama seminggu yang lalu mempunyai pekerjaan tambahan? Ya 1 Tidak 2 → B.IV.E						20. Jika ada penawaran pekerjaan, apakah masih mau menerima? Ya 1 Tidak 2	
14. Lapangan usaha/pekerjaan tambahan utama: (Tulis selengkap-lengkapya) <input type="text"/>						F. PENGALAMAN KERJA	
E. KEGIATAN Mencari PEKERJAAN Lihat R5, Jika "1" → R.15 Jika "2" → R.19						21. Apakah pernah bekerja sebelumnya? Ya 1 Tidak 2 → STOP	
15. Alasan utama mencari pekerjaan. Tamat sekolah/tidak bersekolah lagi 1 Tanggung jawab mencari nafkah/membantu ekonomi rumah tangga/keluarga 2 Menambah penghasilan 3 Pekerjaan yang ada kurang sesuai 4 PHK/usaha terhenti 5 Lainnya (.....) 6						22. Bila "Ya", apakah berhenti bekerja terjadi setelah 31 Juli 1999? Ya 1 Tidak 2 → STOP	
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17. Alasan utama berhenti bekerja/pindah pekerjaan terakhir: (Tulis selengkap-lengkapya) <input type="text"/>						24. Lapangan usaha/pekerjaan sebelum berhenti bekerja/pindah pekerjaan terakhir: (Tulis selengkap-lengkapya) <input type="text"/>	
18. Status pekerjaan sebelum berhenti bekerja/pindah pekerjaan terakhir. Berusaha sendiri 1 Berusaha dibantu buruh/pekerja tidak tetap/pekerja tak dibayar 2 Berusaha dibantu buruh/pekerja tetap dibayar 3 Buruh/karyawan/pekerja dibayar 4 Pekerja tak dibayar 5							

UNIT VALUE INDEXES FOR EXPORTS AND IMPORTS

Report # 36
Statistical Paper # 9

by
Frank de Leeuw

July, 2001



Statistical Assistance to the Government of Indonesia (STAT) Project
USAID Contract No. PCE-I-00-99-00009-00

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Unit Value Indexes for Exports and Imports

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Unit Value Indexes for Exports and Imports

I. INTRODUCTION¹

Price indexes for exports and imports are essential ingredients in measuring GDP expenditures in constant prices; but good data is often difficult to obtain. This paper introduces a new set of indexes for Indonesia based on values and kilograms of exports and imports recorded in customs documents. The indexes are one kind of what is usually referred to as unit value indexes.

The best way to measure export and import prices is to develop a detailed reporting system for prices of many narrowly specified items, adjusted for quality change when appropriate. It is the same approach as is used to measure producer or wholesale prices.² The drawbacks of the method are that (1) it is a major and costly undertaking, and (2) it takes a long time to implement. Nevertheless, it should be considered in any plan for overall development and improvement of the Indonesian statistical system.

Countries without detailed reporting of export and import prices use other sources of information. One source is domestic wholesale or producer price indexes; some components of these indexes usually seem roughly appropriate to components of foreign trade. The problem with this source is that the available wholesale indexes are often poorly matched with actual exports and imports, including no matching at all in many cases. Another source is foreign exchange rates, usually with the US dollar, as an indicator of what is happening to prices of traded goods (measured in the domestic currency). Foreign exchange rates are unquestionably useful--and are used in this report--to convert price changes measured in one currency to price changes in another--for example, dollar prices of exports into rupiah prices of exports. However, foreign exchange rates alone are a questionable indicator of prices of traded goods, because other factors besides prices--for example, foreign investment demand and cross-country interest rate differentials--influence exchange rates. Certainly in Indonesia, the assumption that exchange rate movements reflect only price changes seems implausible.

A third source of information, the one used here, is customs documents that report values and quantities. In the case of Indonesia, values are reported in dollars and quantities in kilograms. Value divided by quantity, or unit value, is taken as an indicator of price, and a weighted average of unit values serves as a price index.

There are three major problems with the unit value approach:

- (1) *Heterogeneity*--The goods reported in customs documents, even those within one (9-digit) product classification, vary greatly in

¹ Dantes Simbolon, Irlan Indrocahyo and Rusman Heriawan were very helpful in collecting and explaining the data underlying this report.

² The wholesale price indexes for exports and imports that BPS now publishes are based on only a small number of items, and therefore fall far short of complete price indexes for foreign trade.

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specification, so that it is impossible to know whether unit values in successive months change because of price change or because of shifts in composition--for example, to brands made of heavier or lighter materials.

- (2) *Inaccuracy*.--Reports may be inaccurate because of clerical errors or, in some cases, because of falsification.
- (3) *Quality change*.--Changes in unit values may reflect not just price changes but changes in the quality of a good--for example, changes in durability or input requirements--that should be counted as a change in output rather than a price change.

The challenge in constructing unit value indexes is to try to minimize the effects of these problems.

Two other unit value methodologies that have influenced the present effort have dealt with the problems of heterogeneity and inaccuracy in different ways. The methodology proposed by the French Statistics Agency INSEE includes an elaborate set of rules for acceptance or rejection of the observations for each product.³ The rules relate to coverage of larger product classes and variability of the unit values for individual products. There seems no reason to believe that they are inferior to the rules used in the present approach; but implementing them is clearly more time-consuming. Earlier efforts by BPS to develop unit value indexes seem to have failed because of the time required for implementation; therefore, a simpler approach seemed desirable.

A recent study by Peter Rosner uses the same source as this report to construct a measure of non-oil export volume for Indonesia covering the period from April 1994 to December 1999.⁴ Rosner deals with the problems of heterogeneity and inaccuracy by rejecting observations in which the monthly change in unit value for a product is above or below certain thresholds, and substituting a volume measure in which value is deflated by the previous month's unit value. The present study uses a different statistical technique, described below. Both approaches are fairly simple to apply.

Neither these approaches nor the present effort deal with the problem of quality change. The measurement of quality change requires detailed investigation of individual products, and is therefore not amenable to easily applied statistical rules. At times, however, it is an important source of error in measures of prices and output. It is therefore another appropriate topic for consideration in overall improvement of the Indonesian statistical system.

³ The INSEE approach is described in various places, including Annex to *Rapport de Mission sur les Statistiques du Commerce Extérieur Albanais*, Direction Générale des Douanes, Bureau des statistiques, INSEE, Division des Echanges Extérieurs, 28 Mai 1998.

⁴ Peter Rosner, "Indonesia's Non-Oil Export Performance During the Economic Crisis: Distinguishing Price Trends from Quantity Trends," *Bulletin of Indonesian Economic Studies*, vol 36, no. 2, August 2000, pp. 61-95

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II. METHODOLOGY

To deal with the problems of heterogeneity and inaccuracy, the steps in the present approach include: collecting customs reports on value and kilograms, grouped into thousands of individual products; measuring the ratio of unit value in the current month to that in the previous month wherever data is available; counting the number of unit value ratio observations in each industry (specifically, the 98 2-digit classes in the Harmonized System (HS)) and discarding of industries with very few observations; and construction of price change for larger product industries by using the median change of the products in each industry. A step-by-step description with comments on each step follows.

A. Collection of Value and Kilogram Data

BPS already collects these data, grouped into the 6000 or so products in the HS code. It is a tedious and time-consuming operation. For some products, a count of units is available, and might be preferable to kilograms for measuring quantity.

B. Changes in Unit Values

For each product, value is divided by kilograms to obtain a unit value, separately for exports and imports. The next step is to calculate ratios of unit values in the current month to unit values in the previous month for each product. Wherever observations for two successive months are not available, there is no recorded change in unit value.

For many products and many months, these changes in unit values are within a reasonable range for changes in prices. However, there are also cases in which unit values suddenly increase several fold or drop by 75% or more--changes that would be most unusual for the price of a narrowly specified product. Presumably, such changes are due to shifts in composition or to inaccurate recording of basic data.

C. Exclusion

To eliminate, or at least greatly reduce, the influence of heterogeneity and inaccuracy, the procedure followed here is (a) to classify products by their industry--specifically, by the 98 2-digit codes in the Harmonized System of international trade classification, (b) to eliminate industries with very few products, and then (c) to take medians of the changes in unit values for each included industry (as always, separately for exports and imports).

Three thresholds for eliminating an industry on the basis of the number of observations were tested: elimination of groups with no observations at all for three months or more during 2000; elimination of all groups with fewer than four observations in at least three months of 2000, and elimination of all groups with fewer than six observations in three or more months. Results presented here are for the first and third thresholds. For exports, 4 industries were excluded

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because of no observations in three months or more, and an additional 17 because of fewer than six observations. The total value of all these exclusions amounted to about five percent of the value of exports. For imports, the corresponding number of industries were 1 because of no observations and an additional 12 because of fewer than six observations, amounting in total to less than one percent of the value of imports. Generally, the omitted industries had much larger and more irregular unit value ratios than the included industries. The specific industries omitted are listed in Appendix A.

Application of the exclusion rules in future years raises some problems. For the moment, industries omitted based on the months of 2000 are being omitted during 2001; but a review of the twelve months of 2001, when the data become available, will produce a new list that may differ from the list based on the months of 2000. The new list could be used to revise indexes for 2001, or could simply be applied to calculations in 2002. The second procedure is simpler, and would be satisfactory unless the possible revision of the total index for 2001 is substantial.

In either case, if the new list fails to exclude some industry that had been excluded in 2000, it will be necessary to establish, for this newly included industry, a link to the base month of January 2000, since all the indexes are equal to 100 in that month. The link could be established in at least two ways: by calculating ratios of unit values in the first included month to unit values in January 2000 for all the 9-digit products in that industry that have observations in both months, and then taking the median of those ratios; or by imputing the movement of the total index (or some appropriate sub-index) to that industry from January 2000 to the first month when it is included. Again, the second procedure is simpler; but it may be worth trying both when the problem first arises, to see if the total index is affected significantly.

D. Median Unit Value Change for Industries

The next, and probably most crucial, step is calculating the median change in unit value for each industry group that was not discarded in the previous step. Using medians rather than means drastically reduces the effect of outliers. The median of the numbers 1, 2, 3, 4, and 5 is 3; but the median of 1, 2, 3, 4, and 5000 is also 3. The only influence the "outlier" of 5000 has on the median arises from its being above rather than below the middle observation. Medians seem a simple and effective way to eliminate the influence of sporadic instances of large shifts in composition and inaccurate records.

Where there are only one or two observations, of course, an outlier will have a big effect even on a median. Even where there are three or four observations, the presence of two or more outliers can drastically affect the median. That is the reason for discarding industries with a small number of observations. Where the number of observations is substantial, outliers will have virtually no influence on the median.

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E. Weighted Average of Industries

The final step is combining the unit value changes for industry groups into overall unit value indexes for exports and for imports. Weights reflecting the relative importance of different industries are necessary for this step. Two weighting systems have been tried: a Laspeyres, or fixed-weight index, with weights based on total values for the year 2000; and a Paasche index, or a weighted harmonic mean with current-month weights for each month. The Laspeyres index is a better measure of month-to-month changes in import and export prices, since its movements depend solely on price changes and not on changes in composition. However, the Paasche indexes are the correct ones to use as deflators if the goal is a 2000-weighted index of the volume of exports and imports.⁵

An important caution in constructing weighted indexes is to adjust the index for excluded industries. For example, assume that weights for all industries add to 100, but that excluded industries account for 5 of the 100. Then it is necessary to divide the sum of weights times included indexes by 0.95 to obtain a correct index.

Indexes for groups of 2-digit industries can be constructed in exactly the same way as indexes for total exports and imports. It may be useful to show separate indexes, for example, for agricultural products or products of heavy industry together with the overall indexes.

III. RESULTS

There are numerous unit value indexes to compare. Table 1 and Chart 1 show three indexes of the dollar unit value of exports and three indexes of the dollar unit value of imports. The export indexes are available through February 2001, import indexes through December 2000. The indexes of the dollar unit value of exports shows little change, while the unit value index for imports rise by about 10 percent from January to December.

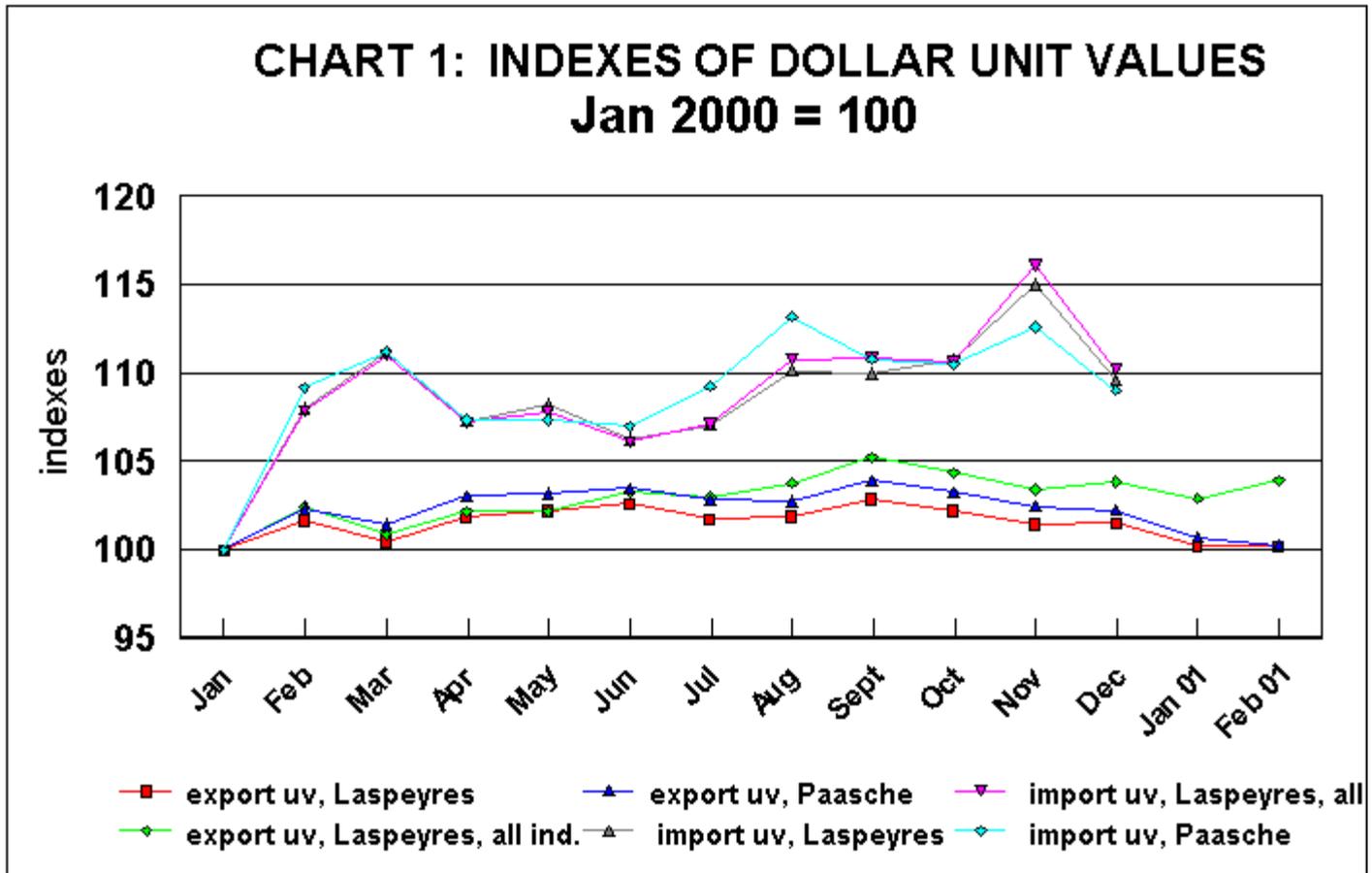
⁵ In decomposing a change in value into a price change and a quantity change, it is desirable to have consistent measures--that is, measures in which an index of quantity or real value times an index of price equals an index of value. Fixed-weight indexes for both quantity and price do not have this property. Of the various combinations of indexes that do have the property, the best known is a Laspeyres index for one component and a Paasche index for the other. That is the system in the Indonesian national accounts; the quantity measures, in 1993 prices, are Laspeyres, and the derived deflators (value in current prices divided by value in 1993 prices) are Paasche. Another consistent system is Fisher indexes--geometric means of Laspeyres and Paasche indexes--for both price and quantity. The final choice of weighting system for these export and import unit value indexes should be one that fits best with weighting plans for the national accounts.

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Table 1
Dollar Unit Value Indexes of Exports and Imports
 (January 2000 = 100)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan 01	Feb 01
A. Exports														
1. Laspeyres included industries	100.00	101.69	100.49	101.90	102.24	102.62	101.76	101.88	102.93	102.24	101.43	101.50	100.19	100.22
all industries	100.00	102.44	100.88	102.21	102.21	103.27	103.00	103.80	105.22	104.34	103.38	103.89	102.88	103.93
2. Paasche included industries	100.00	102.35	101.42	103.03	103.20	103.49	102.86	102.77	103.94	103.24	102.46	102.23	100.73	100.26
B. Imports														
1. Laspeyres included industries	100.00	108.03	111.16	107.26	108.20	106.26	107.05	110.14	109.99	110.81	115.00	109.58		
all industries	100.00	107.90	111.02	107.23	107.83	106.10	107.11	110.78	110.82	110.60	116.12	110.23		
2. Paasche included industries	100.00	109.20	111.18	107.35	107.33	106.98	109.25	113.19	110.81	110.51	112.63	109.02		



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Unit Value Indexes for Exports and Imports

The fairly smooth behavior of these indexes, especially those for exports, might suggest that the use of medians produces indexes with very little change; but detailed examination of the 2-digit indexes--the stage at which medians are applied--indicates that such is not the case. Even if the industries discarded under the fewer-than-six observations are not included, the February 2001 indexes for exports (with January 2000 equal to 100) range from 57 to 165, while the December indexes for imports range from 61 to 269. The smooth behavior of the aggregates results from weighting all these indexes together, not from lack of variability in the individual industry indexes.

Rupiah unit values of imports and exports of course rose much more than dollar prices. The rupiah-dollar exchange rate rose by 30 percent between January and December of 2000. The dollar indexes for December 2000 should therefore be multiplied by 1.3 to obtain rupiah unit value indexes. Indexes for each other month should be multiplied by the ratio of the average exchange rate for that month to the average exchange rate in the reference month.

The three lines for exports measure (1) a fixed-weight (Laspeyres) unit value index covering only the included industries, (2) a fixed-weight unit value index covering all industries, included or excluded, and (3) a current-month-weight (Paasche) unit value index covering only the included industries. Differences between the first two measure the effect of excluding industries with few observations. For exports, the effect is small at first but shows a gradual increase. Differences between the first and the third lines measure the effect of shifting from fixed weights to current-month weights. The effect is small for export unit values.

For imports, the three lines measure the same concepts as for exports. Here the effect of omitting industries matters much less than for exports--probably because a much smaller proportion of value is omitted for imports than for exports. For imports, however, the difference between fixed-weight and variable-weight unit value indexes is more variable than for exports.

Finally, Table 2 and Chart 2 show indexes of nominal and real dollar value. The real value indexes are based on deflation by Paasche unit value indexes that omit industries with fewer than six products in 3 months or more. Real exports, according to this measure, rise by more than 20 percent from January to the September period, then begins to decline. Real imports are weak for a few months; but then rise more than exports--about 45 percent between January and October-November; they then decline slightly in December.

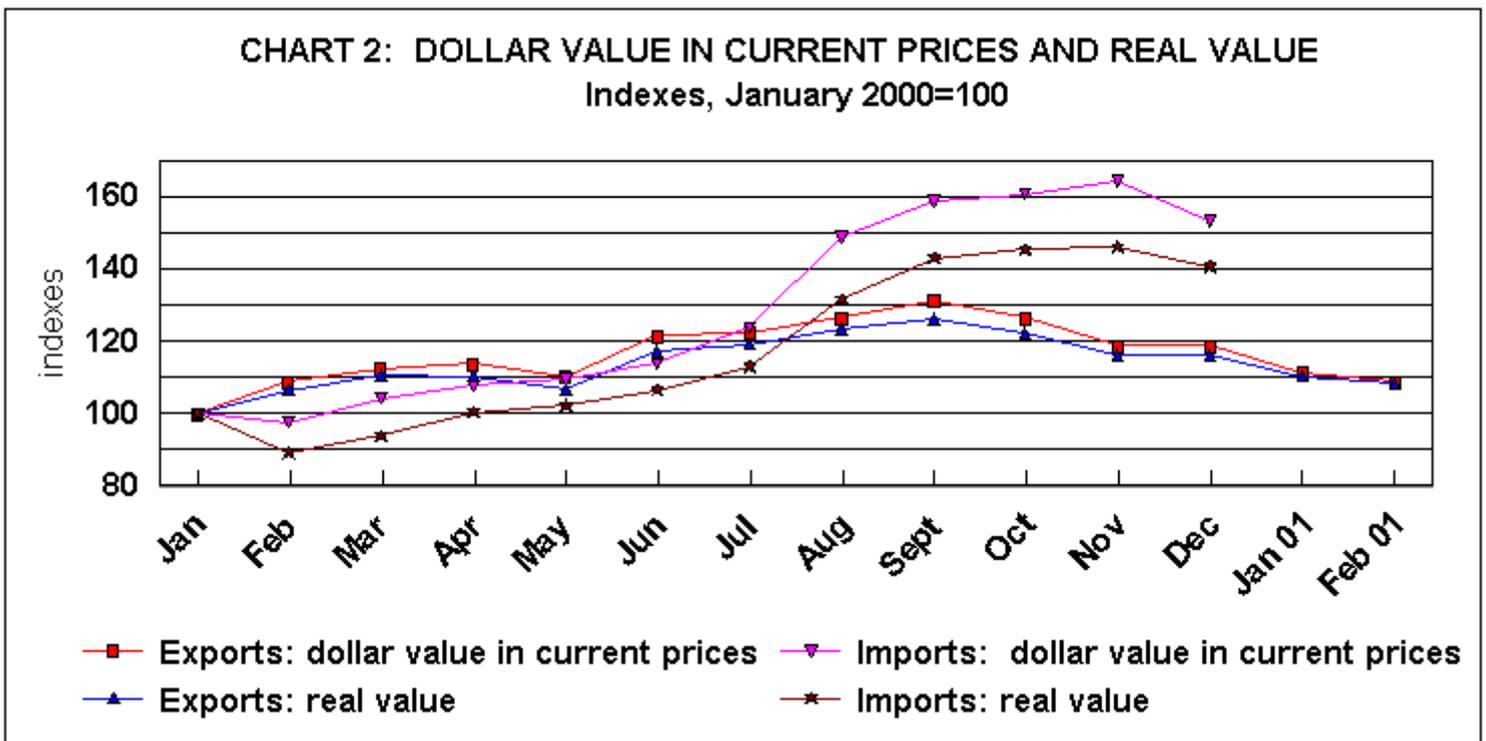
These results for real value can be compared with the national accounts in constant (1993) prices. From the first to the fourth quarter, the change in exports is almost the same in the two series. For imports, the index in this study rises more than real imports in the national accounts. Possible sources of difference include the difference in weighting formula and year, the inclusion of net imports of services in the national accounts series, and of course the different methodologies used to convert current values to real values.

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Unit Value Indexes for Exports and Imports

Table 2
Deflated Value Indexes (January 2000 = 100)
(Deflators are Paasche, included industries)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan 01	Feb 01
A. Exports														
Value	100.00	109.10	112.69	114.06	110.56	121.67	122.69	126.90	131.38	126.61	119.18	118.87	111.28	109.10
Price	100.00	102.35	101.42	103.03	103.20	103.49	102.86	102.77	103.94	103.24	102.46	102.23	100.73	100.26
Deflated Value	100.00	106.59	111.11	110.71	107.13	117.56	119.27	123.47	126.40	122.63	116.31	116.28	110.47	108.82
B. Imports														
Value	100.00	97.74	104.41	107.81	109.87	114.01	123.87	149.18	158.85	160.79	164.74	153.57		
Price	100.00	109.20	111.18	107.35	107.33	106.98	109.25	113.19	110.81	110.51	112.63	109.02		
Deflated Value	100.00	89.50	93.91	100.42	102.36	106.58	113.38	131.80	143.35	145.50	146.26	140.86		



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Unit Value Indexes for Exports and Imports

IV. RECOMMENDATIONS

It seems desirable to calculate unit value indexes for exports and imports on a regular basis, using the methodology described in this report, and make them available to users. The results seem to eliminate many of the difficulties arising from heterogeneity and inaccuracy in the underlying information. The indexes should be useful in preparing the national accounts and in analyzing Indonesian economic conditions generally.

Choices of which industries to exclude and which weighting system to use should not be made permanently at this point. Among the indexes described in this report, Paasche indexes excluding industries with 6 observations or fewer for at least three months seem the best choices. But the final choices should await final decisions on the weighting formulas and time periods that will be used in the national accounts.

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Unit Value Indexes for Exports and Imports

APPENDIX A**INDUSTRIES DISCARDED BECAUSE OF FEW OBSERVATIONS****I. EXPORTS***A. Discarded because of 0 observations*

- 43 Furskins and artificial fur
- 51 Wool horse hair yarn woven fabric
- 81 Other base metals
- 93 Arms and ammunition

B. Discarded because of 1-5 observations

- 02 Meat and edible meat offal
- 10 Cereals
- 26 Ores slag and ash
- 31 Fertilizers
- 36 Explosives matches pyrotechnic prod
- 37 Photographic and cinematogr. goods.
- 45 Cork and Articles of Cork
- 50 Silk
- 53 Other vegetable textile fibers
- 75 Nickel and articles thereof
- 78 Lead and articles thereof
- 79 Zinc and articles thereof
- 80 Tin and articles thereof
- 86 Railway loc. tramway track and part
- 88 Aircraft spacecraft and parts
- 89 Ships, boats, and floating structures
- 98 PEBT

II. IMPORTS*A. Discarded because of 0 observations*

- 43 Furskins and artificial fur

B. Discarded because of 1-5 observations

- 01 Live animals
- 06 Live trees and other plants
- 14 Veg. plaiting mat veg. products.nes
- 36 Explosives matches pyrotechnic prod
- 45 Cork and articles of cork
- 46 Manufac. of straw basketware
- 50 Silk
- 66 Umbrellas whips walking-sticks
- 67 Prepared feathers artifice. flowers
- 88 Aircraft spacecraft and parts
- 93 Arms and ammunition
- 97 Works of art antiques

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Unit Value Indexes for Exports and Imports

APPENDIX B

FORMULAS

I. Individual product formulas

These are all elementary. Unit values for each product are dollar values divided by kilograms. Ratios of unit values for each product are unit values for the current month divided by unit values for the previous month.

II. Industry index formulas

Each industry's unit value ratio for each month is the median of the unit value ratios for all of the products in that industry. In the case of an odd number of products, it is the middle one of the ratios ranked by size. In the case of an even number of products, it is the arithmetic mean of the two middle ratios.

The unit value ratios for each industry are chained together to construct an index of unit values for that industry, symbolized by $I_{i,t}$ for industry i in month t . With January 2000 equal to 100, $I_{i,t}$ for February is $100 * R_{feb}$, where R_{feb} is the unit value ratio for the industry in February. For March, $I_{i,t}$ is $100 * R_{feb} * R_{mar}$, where R_{mar} is the unit value ratio for the industry in March.

III. Indexes for groups of industries and all industries

The report shows Laspeyres and Paasche indexes. Both of them make use of the total value of each industry in the year 2000, and the index for each industry.

The Laspeyres formula for an index with the average for 2000 equal to 100 is:

$$L_{t,2000} = 100 * \sum_i \left(\frac{V_{i,2000}}{\sum_i V_{i,2000}} \right) * \left(\frac{I_{i,t}}{I_{i,2000}} \right)$$

where $L_{t,2000}$ is the index in month t , $V_{i,2000}$ is the value of industry i in 2000, the summation of values is over all industries included in the index, $I_{i,t}$ is the index for industry i in month t with January equal to 100, and $I_{2000,i}$ is the average of index $I_{i,t}$ in the year 2000.

To convert this index, in which the average for all the months of 2000 equals 100, to an index in which January 2000 is equal to 100, divide the index by the index for January 2000 and multiply by 100.

The Paasche formula for an index with the average for 2000 equal to 100 is:

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Unit Value Indexes for Exports and Imports

$$P_{t,2000} = 100 * \left[\sum_i \left(\frac{V_{i,t}}{\sum_i V_{i,t}} \right) / \left(\frac{I_{i,t}}{I_{i,2000}} \right) \right]^{-1}$$

where $P_{t,2000}$ is the index in month t, $V_{i,t}$ is the value of industry i in month t and the rest of the notation is exactly the same as in the Laspeyres index.

As in the Laspeyres case, to convert these indexes to indexes with January 2000 equal to 100, simply divide by the index for January 2000 and multiply by 100.

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Unit Value Indexes for Exports and Imports

APPENDIX C

DATA FOR INCLUDED 2-DIGIT INDUSTRIES

Table C.1
Dollar Value of Exports (000)

HS	MONTH												1	2
	1	2	3	4	5	6	7	8	9	10	11	12		
1	3396	2134	3210	3542	3225	3126	2805	3963	3178	3580	3190	3810	2438	2134
3	108875	99355	112180	110008	116892	140287	146447	138318	133002	126110	124067	124929	137010	99355
4	2920	4304	7638	9026	8123	12266	12278	10432	7552	12786	13684	10531	9865	4304
5	256	246	575	361	342	385	452	444	743	495	642	625	466	246
6	837	594	795	687	573	668	759	927	1103	1127	837	676	1388	594
7	3534	2541	3074	4016	2559	3831	2722	2980	4136	3963	3168	4151	3867	2541
8	15822	15310	12297	10187	8695	6474	8774	6878	8694	10096	12664	10893	8135	15310
9	45359	42851	41957	46324	60032	79248	101604	101213	79968	63842	44086	41987	38596	42851
11	697	519	611	999	750	2570	832	1374	1397	709	431	1226	810	519
12	3013	3480	3128	3109	3789	6120	3778	3287	3515	2704	2747	3921	2180	3480
13	1818	1875	2330	2037	2135	2625	2555	2527	2572	2473	1895	2060	1633	1875
14	1251	1469	2378	1256	1823	2559	2821	3049	2603	2740	2881	1619	1414	1469
15	100752	131582	154437	143457	133681	204511	165500	164561	184861	128133	130407	121681	80433	131582
16	5067	6569	8457	8196	8582	13388	8713	9356	11881	9330	10496	7628	7098	6569
17	3496	3787	4559	4060	5524	4830	5396	6349	6290	6582	4929	4163	4382	3787
18	19592	18984	17606	15821	36567	40153	48665	36280	20964	29265	27634	30328	18288	18984
19	4697	4575	5355	5105	4983	6243	6467	7214	6979	7628	6592	6243	6003	4575
20	8834	9021	8865	11534	11771	10427	13704	12027	11865	11586	9987	5755	9614	9021
21	2846	3018	3054	2957	4262	3247	2877	4421	2940	3320	1962	2240	3546	3018
22	1189	1220	1798	2048	1380	3361	2355	3122	2350	1875	2105	1081	1693	1220
23	8428	5996	6998	6808	7792	8001	7564	9631	8742	7710	7219	7629	5462	5996
24	8237	8615	22105	13569	20253	16608	20159	28544	24508	23242	15881	19255	17131	8615
25	18723	18538	17696	22410	25526	23406	17281	21873	17980	15702	13799	16089	24718	18538
27	1241854	1205490	1194904	1086371	1138439	1291559	1242284	1412198	1446009	1543856	1450282	1430671	1347505	1205490
28	10011	11169	8781	11280	16024	18623	18123	12139	14975	19596	27031	19150	21156	11169
29	94479	82171	109237	91178	89647	98983	80663	84077	82255	94732	81442	89551	71883	82171
30	5130	4468	6182	4012	4251	3888	6725	5098	6803	7232	5152	8383	4724	4468
32	6165	7350	8396	6831	8748	10068	10471	9933	8779	10374	8161	8449	5335	7350
33	8214	10244	8029	9871	9478	8694	12486	10399	10607	12492	9710	10273	8685	10244
34	17634	15348	19164	19710	14927	18386	17361	18939	17322	19039	16434	10541	17166	15348
35	1093	1313	962	664	965	991	544	1062	678	574	756	674	1007	1313
38	30226	22625	27378	30086	35129	33795	26981	32773	29943	25283	31426	23443	20665	22625
39	92072	97175	92579	96575	91355	98136	116876	117641	95254	108268	96343	82200	94017	97175
40	99687	112358	119826	120954	112391	102061	138497	113593	124088	123912	90141	92452	91807	112358
41	5525	6401	8964	8479	7987	8584	8853	8246	7405	8679	8893	8636	5897	6401
42	18434	22695	26693	24768	27128	29420	29409	22970	31114	21936	27974	22998	29020	22695
44	269616	298105	323937	338027	314791	331815	307481	297561	310698	318741	283283	243275	253424	298105
46	4507	5383	7936	6469	5414	5782	6062	4847	5368	6083	5623	6710	5419	5383
47	57029	69633	55164	84699	97070	80613	53906	38687	82278	39147	25644	30113	22239	69633
48	175414	183318	213170	192806	193531	209872	196549	196208	218129	195688	145938	142490	134906	183318
49	777	762	2347	1483	1859	2117	3221	3767	4170	1743	1245	1239	1432	762
52	53984	64363	65067	68711	60771	71996	61392	64259	61758	72552	65720	57631	62329	64363
54	85493	107871	105083	97144	97637	109834	115220	111951	103882	111491	98839	92860	93434	107871
55	78337	81747	83838	85779	81147	84994	98650	92191	83687	94365	79743	72724	74301	81747
56	2853	2827	4192	2495	3411	3169	3465	3554	3640	2705	3178	3171	2643	2827
57	2323	2727	2005	2265	2020	2633	2165	2325	2196	3108	2683	1852	2328	2727
58	5801	7365	7042	8571	8408	10225	7447	9843	8362	7383	7561	13086	7596	7365
59	10347	10953	13189	11365	9633	13632	13302	12329	10968	11147	9792	10156	10962	10953
60	3649	24318	7056	4502	5134	5537	4946	4102	3987	3568	4215	4834	4359	24318
61	87240	100481	109020	99325	116262	146759	193618	167905	164798	126713	121589	122241	109404	100481
62	186158	221889	217353	215945	244033	278074	336971	264591	298819	232474	246077	263483	231048	221889
63	14078	17035	20735	19034	17731	18870	20306	21091	21595	23878	18247	16219	15886	17035
64	164624	162727	131815	154351	152002	139617	149192	104802	151974	100667	126761	133580	152924	162727
65	1644	2369	2785	2378	2301	2757	3412	3183	1788	1852	2002	2919	3187	2369
66	3608	3549	2822	948	1031	368	418	275	539	700	2544	2452	3131	3549

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67	3533	4000	4642	4117	4730	4883	5014	11722	5166	4064	3614	3528	3185	4000
68	7998	6698	9277	7960	7597	10363	8059	9024	8056	6472	6545	6503	5078	6698
69	11300	14563	14658	17204	15418	18895	19538	18455	17087	23064	15604	12734	17444	14563
70	24911	36627	30151	29799	27829	27931	29518	31427	33093	28960	23827	19906	25585	36627
71	47689	48720	58217	35489	34161	37485	50874	49911	39050	49011	52163	48251	65094	48720
72	36784	36902	37735	27229	32407	43547	19759	30758	35554	37701	16558	31976	13638	36902
73	32530	26346	36214	32311	34740	50040	40575	42090	36156	42213	35631	36878	27430	26346
74	34149	33933	43257	34626	12557	31749	44287	37770	30442	38493	35017	31757	30340	33933
76	37559	36891	34362	36491	33065	46784	37417	34478	50971	34603	34915	34477	40681	36891
82	5478	7868	8307	9501	6855	6538	7895	7078	8657	8616	7362	7599	4853	7868
83	2747	2869	3793	4325	3502	3891	3869	4954	4689	4307	3840	2903	3150	2869
84	218998	318719	265403	306916	299801	308450	259211	433868	404535	357256	336923	328931	297840	318719
85	313731	547606	476733	681178	524430	521911	489441	620631	677222	552603	520169	537815	551426	547606
87	35149	38131	45251	43783	40452	45558	47894	44721	33848	46326	39338	31954	38198	38131
90	23832	23149	24325	30226	27652	26578	25941	27966	37410	23277	27964	22223	24103	23149
91	380	338	433	407	446	406	590	322	515	645	554	269	360	338
92	6908	15609	14306	18816	14500	15406	14721	16657	19200	13846	16107	12150	13340	15609
94	129749	133399	151387	143028	135104	121106	108238	104620	128787	149573	129142	125698	105959	133399
95	14717	27107	32348	47994	26207	41107	36973	41489	45149	31917	21100	15718	14788	27107
96	7140	9668	12206	10960	13165	13252	12289	12706	11383	11062	9836	9093	9048	9668
97	337	374	660	305	748	459	309	105	272	173	127	107	150	374

Total 4203266 4722334 4750418 4857257 4735280 5212528 5133916 5412061 5588933 5289163 4882068 4777444 4587683 4722334

Table C.2
Industry Export Indexes (January 2000 = 100)

HS	MONTH													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	100.00	101.14	108.42	104.58	90.29	88.32	99.97	104.74	91.07	81.00	86.42	99.54	72.82	92.01
3	100.00	105.50	99.71	97.38	100.03	87.84	92.70	92.02	89.82	94.06	97.97	92.69	105.97	106.70
4	100.00	99.73	102.81	102.72	83.56	96.27	102.51	90.27	118.09	119.95	119.95	303.83	124.50	148.24
5	100.00	63.13	98.97	178.52	146.44	135.34	187.74	169.45	159.98	151.73	128.05	231.33	124.21	78.37
6	100.00	65.36	77.46	61.21	89.93	119.23	113.75	104.76	101.60	122.35	94.91	117.62	109.78	73.02
7	100.00	93.98	95.82	101.49	97.09	94.07	114.86	105.28	99.91	109.05	113.46	100.05	109.94	106.59
8	100.00	89.43	87.68	98.00	95.21	92.63	80.96	81.11	74.34	74.02	71.78	67.52	61.70	69.98
9	100.00	103.31	102.86	103.01	109.79	110.43	105.24	104.19	99.75	103.23	95.36	100.72	89.50	117.11
11	100.00	121.01	91.96	94.43	88.70	86.27	87.39	85.71	76.34	104.19	252.43	219.70	238.51	274.39
12	100.00	122.19	97.40	90.54	83.63	95.86	111.19	103.56	94.84	114.46	72.12	177.36	73.15	93.14
13	100.00	95.87	94.27	97.21	80.38	76.90	83.20	67.67	79.77	79.36	85.05	107.86	84.48	104.99
14	100.00	83.92	84.54	92.06	110.13	101.51	92.33	89.97	89.55	95.82	107.51	111.02	109.43	112.41
15	100.00	98.76	93.33	89.35	90.24	85.54	88.25	76.89	89.48	76.81	70.71	72.60	68.56	95.61
16	100.00	110.81	105.26	90.95	98.80	98.60	89.05	96.19	98.47	110.48	104.82	90.72	104.51	147.16
17	100.00	99.75	100.17	101.28	97.82	96.02	94.39	82.28	89.32	100.03	104.77	93.01	108.46	113.05
18	100.00	100.06	106.18	110.32	108.91	105.16	103.04	102.12	105.15	111.51	106.33	112.50	110.24	97.63
19	100.00	91.20	92.29	89.32	82.83	77.41	73.83	76.72	68.72	74.86	67.28	73.52	70.49	67.08
20	100.00	92.76	90.01	96.31	94.72	100.07	100.92	108.52	114.72	108.83	109.69	115.31	101.99	107.45
21	100.00	103.73	108.69	99.74	113.83	88.07	102.05	123.77	103.37	110.08	111.58	119.84	118.61	107.99
22	100.00	110.95	117.13	120.65	108.23	111.46	98.96	100.85	98.25	105.10	90.54	103.18	108.38	83.04
23	100.00	100.00	95.09	103.43	85.52	85.12	82.47	82.05	85.59	83.57	85.84	90.59	91.46	97.62
24	100.00	104.04	115.26	128.51	109.18	112.86	100.04	101.15	99.93	93.18	128.02	141.61	139.43	136.89
25	100.00	90.12	93.81	97.08	90.37	88.53	89.00	84.83	82.71	84.63	85.15	83.03	85.30	90.86
27	100.00	101.31	106.16	108.12	110.57	112.43	111.71	114.83	117.00	121.22	114.93	109.00	103.94	94.85
28	100.00	100.52	100.12	97.65	96.69	97.80	97.57	98.46	99.41	96.09	97.05	97.29	95.14	89.65
29	100.00	99.28	101.02	104.84	100.73	100.86	99.71	99.87	99.58	102.17	101.77	101.66	101.67	101.67
30	100.00	87.85	120.54	102.42	108.92	90.78	97.74	113.68	108.71	111.55	126.26	149.49	163.81	89.11
32	100.00	107.53	109.60	106.38	109.04	106.59	108.60	106.16	95.85	93.45	80.22	79.44	75.47	82.00
33	100.00	116.37	116.01	108.34	119.35	103.42	122.01	124.95	122.94	118.93	108.46	118.45	100.57	143.79
34	100.00	105.30	97.25	94.85	93.04	100.43	99.47	98.74	100.74	100.03	95.50	89.01	90.95	99.07
35	100.00	100.84	101.06	134.79	145.91	141.13	145.01	155.66	119.01	195.72	164.78	271.47	179.64	237.30
38	100.00	108.36	105.25	104.62	105.51	99.96	95.68	95.56	99.00	98.83	101.44	98.20	97.09	105.47
39	100.00	102.74	104.11	104.79	104.78	103.75	101.79	102.69	101.52	101.64	99.40	98.91	99.37	93.69
40	100.00	101.93	101.59	101.00	99.78	100.92	99.53	98.38	100.78	99.58	100.28	96.77	96.88	100.52

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Unit Value Indexes for Exports and Imports

41	100.00	111.54	106.91	104.42	87.44	95.34	95.48	94.62	81.76	77.14	80.16	77.96	83.59	73.30
42	100.00	106.56	90.79	94.40	79.31	97.24	104.82	97.75	96.24	77.33	92.05	87.84	80.83	102.41
44	100.00	104.38	99.54	99.08	98.88	99.82	99.10	99.33	99.20	97.04	95.32	96.22	96.24	101.87
46	100.00	119.40	88.87	102.84	77.23	116.66	84.89	96.95	107.61	71.20	73.60	106.38	96.16	127.56
47	100.00	110.50	96.49	86.49	90.31	92.80	111.79	92.60	101.26	105.85	89.66	79.66	88.02	109.79
48	100.00	105.01	105.46	108.93	111.58	111.79	115.06	115.07	109.77	109.77	108.21	110.39	111.53	107.84
49	100.00	56.22	52.47	71.29	60.47	49.03	51.87	43.73	50.63	47.37	46.90	48.98	44.31	50.11
52	100.00	100.71	99.46	99.64	102.14	101.85	99.09	99.09	102.16	97.57	97.58	96.87	97.04	101.56
54	100.00	98.31	100.44	101.95	93.71	93.91	93.32	90.91	94.50	93.07	93.85	96.07	94.04	97.54
55	100.00	102.60	103.45	103.31	107.44	105.93	103.24	105.12	106.12	103.16	107.65	106.55	103.73	109.11
56	100.00	94.51	98.42	90.16	101.80	98.65	112.11	106.97	104.36	103.52	104.02	101.03	114.62	113.75
57	100.00	84.30	83.72	84.84	83.63	70.08	70.08	86.20	80.74	82.00	82.51	90.83	81.83	77.03
58	100.00	139.42	153.96	150.96	146.23	174.84	146.97	132.87	128.38	103.24	90.05	112.49	92.01	105.07
59	100.00	108.44	125.01	110.49	112.56	96.20	96.72	98.69	92.27	96.89	108.26	124.70	133.30	125.88
60	100.00	105.76	108.13	106.36	103.78	110.26	109.27	107.25	107.81	99.06	111.10	108.11	95.79	108.10
61	100.00	102.51	101.25	95.37	98.98	102.88	101.59	101.28	106.41	97.92	103.09	105.83	105.04	104.96
62	100.00	92.72	88.75	91.01	88.05	90.80	90.51	86.18	86.29	82.93	89.21	97.22	99.84	91.54
63	100.00	111.40	108.12	109.36	113.90	109.40	113.97	109.19	105.88	104.35	99.25	103.60	100.03	105.91
64	100.00	107.88	105.99	104.25	103.27	114.22	118.28	113.32	112.16	103.88	103.73	111.47	117.72	132.99
65	100.00	156.60	120.32	115.02	99.19	59.52	62.94	55.62	41.55	48.46	44.82	45.13	32.51	40.64
66	100.00	125.46	109.49	117.68	51.54	109.89	92.86	193.63	188.51	257.53	396.73	237.84	781.98	714.79
67	100.00	103.14	101.24	124.56	119.82	103.49	105.66	121.15	87.36	98.65	118.17	126.79	108.50	84.09
68	100.00	100.91	95.89	96.78	94.96	95.99	85.06	85.45	90.15	84.18	91.81	95.75	99.80	103.55
69	100.00	100.95	100.94	104.40	93.12	82.26	81.03	83.58	75.49	66.56	72.09	79.61	73.07	77.59
70	100.00	95.30	98.00	97.90	99.57	100.45	102.58	107.21	108.47	105.58	105.88	108.04	103.62	103.87
71	100.00	110.23	64.07	81.76	76.15	105.52	89.34	68.45	58.99	56.74	64.34	53.40	59.12	104.46
72	100.00	100.03	98.92	100.72	100.72	96.20	103.83	101.31	100.52	106.49	105.69	105.07	107.61	99.32
73	100.00	103.32	104.13	101.70	109.62	111.01	112.78	116.11	114.65	113.87	111.20	114.33	116.98	114.57
74	100.00	104.41	102.17	109.15	112.04	112.21	112.72	111.35	112.39	116.94	119.96	117.30	113.72	116.39
76	100.00	102.73	100.86	97.78	99.58	99.52	100.73	101.36	100.83	99.91	107.66	107.01	107.38	108.81
82	100.00	130.82	139.60	141.52	101.03	97.23	87.19	67.19	74.63	70.62	66.73	58.83	54.81	64.18
83	100.00	98.46	79.52	86.64	90.03	89.23	78.88	92.99	90.05	92.88	88.99	105.97	101.56	101.30
84	100.00	103.52	99.89	102.76	103.05	99.07	92.88	101.64	105.99	100.75	103.94	103.32	108.51	105.84
85	100.00	99.03	96.08	100.09	101.76	98.70	93.66	96.01	94.93	95.10	96.19	100.55	96.75	92.66
87	100.00	101.14	94.24	98.35	95.83	91.82	94.94	94.57	88.56	84.27	87.72	90.24	91.74	92.51
90	100.00	98.87	116.47	115.39	105.57	116.45	120.94	103.90	105.14	97.89	100.21	105.11	133.06	105.99
91	100.00	93.52	110.66	110.90	114.19	72.88	118.23	53.51	53.54	37.89	34.01	44.19	43.39	44.13
92	100.00	98.38	102.65	100.22	100.28	105.07	106.19	102.95	120.77	109.20	117.13	112.39	103.68	100.34
94	100.00	99.68	95.42	99.03	100.33	100.67	105.07	104.14	104.40	104.41	105.00	106.00	100.24	103.11
95	100.00	117.61	113.39	119.61	111.76	115.18	113.28	112.24	120.24	117.39	115.33	108.21	96.83	104.77
96	100.00	102.35	90.72	93.72	92.29	88.16	86.45	89.85	90.79	89.60	86.60	84.30	84.22	106.88
97	100.00	116.50	221.31	175.17	132.74	189.46	99.94	99.82	123.35	69.69	44.87	64.73	73.92	75.04

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Unit Value Indexes for Exports and Imports

Table C.3
Dollar Value of Imports (000)

HS	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
2	2707	2904	3356	5308	3534	4389	6971	8189	9125	6967	10169	9594
3	1833	1872	2256	2130	3106	1997	3746	3514	4277	3037	3012	4086
4	7171	9347	18801	14160	20702	17149	27300	22589	26598	31098	38695	25940
5	470	1328	836	832	890	1281	1775	1207	2374	1425	1641	2743
7	3555	2308	4692	6532	8541	5592	11119	9146	9018	8084	7894	8157
8	6680	5165	6325	8546	8918	6390	10966	15458	17867	14800	18700	20788
9	5159	4727	4688	4754	7965	7493	12962	13833	3504	4825	3376	3847
10	56336	77901	64795	60596	94172	94070	62894	73199	51280	119413	112132	115826
11	11340	15018	13219	11761	8557	9668	8996	9922	12772	12313	13492	12490
12	45026	33019	29642	31548	36144	39979	22824	7994	23713	19252	19217	27436
13	1241	2038	1388	1533	1606	1454	1359	2657	2421	2111	2380	1678
15	1896	1439	2198	2185	2734	2900	3815	4255	4224	3541	4645	4197
16	226	131	217	352	311	251	360	314	527	337	817	378
17	26606	18014	32143	31389	42660	24019	12391	23328	24750	11035	26168	42798
18	1294	1521	2951	1709	456	935	2051	1997	2037	2145	2111	2848
19	1227	779	1061	1751	1057	2592	2509	2300	2813	2553	2858	2221
20	1037	608	795	876	935	1533	1970	2106	3492	1903	2355	1634
21	2844	2241	4411	3081	3074	3296	4941	6094	6275	5452	7660	5108
22	1826	1135	1477	3091	1103	1027	1516	1028	1159	1420	2605	834
23	25567	34122	27066	26283	37068	45602	35288	58712	44750	56660	48933	47339
24	14943	16329	12638	14838	11929	13062	9647	8900	13793	13350	19061	15204
25	17397	16617	24573	20227	15883	15825	21852	23449	20273	20122	18134	16897
26	10723	20680	968	11263	6343	8514	16878	9672	8596	4295	2826	2524
27	431695	366592	482742	468815	451064	476816	501278	679998	692137	608359	613854	302278
28	23991	37014	39042	31535	38057	45051	51692	54882	52205	62549	48886	50848
29	135225	194113	192482	203365	182769	203571	213118	225807	267573	214136	250218	302786
30	4969	6124	8367	6100	7342	8026	8512	11905	7870	5159	8118	6237
31	19267	22963	20227	14965	10863	15164	10239	9485	15338	11537	15687	19365
32	21011	27624	30799	32089	27409	30687	48334	54292	55131	43436	53227	43099
33	6246	6454	11271	12279	8889	14610	17617	19978	21044	16785	20738	16234
34	12970	11294	14388	11841	11370	14846	21598	19336	20862	19464	23074	20839
35	9793	9135	8797	9512	9849	6878	10581	10663	10273	12965	12855	12804
37	5040	7108	5780	5626	5582	5415	6444	5103	6415	6939	7917	6227
38	24706	31742	31354	33104	34422	33869	47866	52379	50249	45090	51318	55386
39	48449	66810	80762	84756	69470	69251	116939	123595	141185	120649	141016	142500
40	24639	21347	22478	28019	28524	27508	32678	33838	36731	33806	40045	40524
41	9690	15802	13235	13991	9743	8027	15171	17518	27279	24756	28431	17421
42	490	478	632	357	1637	407	698	3886	468	911	447	582
44	6332	8038	6842	8139	10565	9857	13259	14500	14198	11410	12038	11955
47	51125	51320	76761	66422	74811	78938	99916	132688	114019	112635	121554	84635
48	20593	17472	17804	22925	20563	20138	28755	31452	29942	30397	38533	31813
49	2532	1082	1089	1056	1118	1480	1357	2010	3778	1199	2757	3164
51	1233	1163	1651	1958	1402	2295	4508	2383	1646	2282	3122	1831
52	49760	56403	62669	74512	70790	60253	90344	90862	109439	96939	119882	83703
53	388	696	1087	1125	495	519	481	1730	2305	1979	1946	1574
54	17636	24080	25344	24218	24711	20599	37237	41836	48621	35047	45701	31081
55	19721	23193	22825	24472	19813	21431	42618	40393	45878	36973	47105	31356
56	3404	3973	5217	4848	3376	4099	6832	5798	8336	6773	6982	6774
57	158	97	137	169	156	172	266	278	201	349	229	614
58	2951	4522	5549	4483	4493	4519	5823	6947	8950	7682	7675	6684
59	11328	11887	14697	14902	12196	10700	18647	17746	22646	19160	23551	21650
60	4893	6768	10443	9068	7679	10894	16432	13998	18341	14940	18203	14028
61	522	446	515	536	452	486	1074	1161	835	743	955	576
62	1056	822	832	1307	1688	1533	1394	1565	1642	1794	2071	1453
63	1544	620	667	505	885	764	1447	1677	1068	1160	1338	2135
64	4758	5239	7202	5861	6699	4708	7917	6677	9163	9282	10600	9277
65	48	99	137	58	54	137	318	102	111	56	110	65
68	2388	2264	2377	2654	3907	2677	3833	6247	4323	4205	5417	6087
69	3912	4206	3485	4039	5201	6114	4351	10400	7338	5585	6723	6164
70	4340	3683	6202	4541	4572	4612	6819	7042	8607	7870	9453	7426

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71	325	441	597	287	249	156	546	2253	392	1952	711	2713
72	77872	72770	103707	115813	96613	80213	109572	126839	145249	170654	146069	128830
73	147885	31462	32379	44317	49108	50768	54559	59533	45745	68609	67089	71891
74	7747	9680	6518	9301	8118	5172	10427	14250	15068	12393	22734	16456
75	208	772	1695	834	715	599	1364	645	2006	978	2125	898
76	18752	20226	24126	21847	26896	23042	28625	32868	38511	32302	42615	41474
78	1516	2065	1506	907	451	1371	2228	2545	3575	3743	3454	2888
79	5227	6140	8431	5761	9081	4510	11828	10746	11340	13307	18841	11522
80	188	350	241	851	180	872	462	69920	910	345	818	260
81	382	504	471	1384	1179	914	799	1156	1339	1513	906	916
82	6002	8062	6018	6143	5918	6812	9210	9752	8522	8035	10873	12091
83	3978	3888	4716	4834	4884	5279	8643	9533	9581	9473	11544	9977
84	268817	285003	297053	326097	294732	324814	358631	439771	498258	523926	586662	614922
85	87760	68933	90372	86376	83626	115964	112868	129781	133618	131168	135483	175964
86	1145	1338	597	1013	1501	1777	803	2238	1776	20264	2092	2173
87	81656	92465	106275	102713	121565	126905	123420	170144	203158	252595	229276	280371
89	94564	118648	28206	62578	136165	132482	7655	3996	52343	107562	34499	88479
90	106466	29098	31847	21665	19941	24641	32083	43207	41152	62875	41619	36328
91	557	356	331	274	717	587	380	590	2218	1157	597	782
92	2070	2347	2375	1775	631	2095	2967	3364	3043	4001	2357	3225
94	4094	19929	917	1906	2504	6755	2223	7736	1660	4548	1642	2088
95	2035	948	1087	1455	2044	2941	2621	2502	2765	2437	3144	3257
96	4333	5415	5592	6332	5774	6054	6897	6998	8292	7393	9685	9154
Total	2159488	2102759	2251442	2323363	2362898	2460795	2669336	3220385	3392309	3422369	3545495	3292405

Table C.4
Industry Import Indexes (January 2000 = 100)

HS	MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
2	100.00	102.34	102.52	97.54	103.62	103.28	103.30	99.62	90.57	84.94	90.25	86.17
3	100.00	100.06	72.46	80.52	86.40	84.07	85.39	83.02	80.51	80.35	88.93	83.46
4	100.00	95.57	98.05	96.91	97.75	98.76	98.89	94.08	92.31	93.79	92.99	90.51
5	100.00	104.99	108.70	76.33	64.62	75.88	75.88	53.26	59.16	50.26	66.04	53.17
7	100.00	98.38	93.76	89.62	102.61	105.05	110.13	113.36	101.28	97.96	96.33	105.23
8	100.00	103.05	105.17	102.66	99.53	101.92	96.65	92.08	94.66	94.47	95.02	92.08
9	100.00	157.73	134.85	169.33	174.19	213.51	185.50	200.90	177.48	176.74	181.65	140.94
10	100.00	93.21	87.76	84.77	88.76	77.89	78.37	80.36	80.92	76.84	68.38	78.54
11	100.00	99.94	114.66	104.36	106.98	105.68	110.70	115.52	115.90	117.01	121.08	109.38
12	100.00	104.01	104.56	108.70	104.84	104.73	121.46	113.14	114.41	112.65	110.40	114.70
13	100.00	94.01	93.00	99.30	86.39	94.15	154.16	135.23	112.04	129.24	127.75	133.39
15	100.00	101.48	107.64	111.91	111.91	117.40	109.53	104.67	102.76	99.64	104.99	105.12
16	100.00	114.73	146.93	151.50	127.00	111.39	91.81	87.59	93.63	87.93	113.64	66.50
17	100.00	91.92	98.96	96.85	106.58	106.70	108.26	105.64	102.56	111.53	111.65	109.16
18	100.00	86.95	91.21	90.90	76.91	77.60	83.92	87.92	78.27	78.62	78.80	79.56
19	100.00	111.27	115.77	118.26	100.04	88.88	104.96	88.42	105.71	89.99	90.22	97.82
20	100.00	101.37	128.18	111.94	114.40	109.25	99.30	101.99	101.38	96.14	105.85	96.21
21	100.00	129.33	154.76	139.06	116.54	89.25	116.11	125.14	136.69	142.13	121.37	130.71
22	100.00	101.33	89.35	147.35	157.70	145.73	89.60	115.27	97.25	136.00	111.49	96.29
23	100.00	102.10	101.85	104.39	97.50	104.16	106.88	103.53	110.69	107.76	107.20	109.31
24	100.00	131.24	123.40	103.64	107.52	115.49	117.51	132.13	142.81	124.63	119.11	120.53
25	100.00	99.58	100.93	97.23	96.18	99.11	102.83	98.53	98.79	96.02	104.89	108.17
26	100.00	146.36	142.54	144.50	144.50	147.01	132.88	136.33	148.78	141.20	141.81	145.61
27	100.00	104.11	111.09	105.46	110.19	110.24	112.57	123.37	120.73	121.82	116.73	121.21
28	100.00	103.36	98.79	97.91	100.39	97.05	97.40	98.38	93.97	100.12	96.71	94.64
29	100.00	101.17	104.11	104.11	105.78	104.46	103.43	101.37	102.16	102.84	99.36	98.75
30	100.00	104.84	127.34	101.82	119.71	120.11	124.20	119.55	75.43	108.52	112.52	93.90
31	100.00	113.03	98.93	98.18	99.13	97.24	114.00	108.34	103.41	100.64	91.53	92.28
32	100.00	103.22	101.14	99.90	103.50	93.14	103.53	100.63	99.24	103.81	100.75	96.26
33	100.00	91.50	104.47	103.67	93.80	71.75	78.35	81.40	90.05	85.53	95.19	89.66
34	100.00	93.03	91.85	89.49	83.21	92.88	96.32	77.70	78.64	69.47	79.50	68.35
35	100.00	136.03	123.75	127.80	117.71	123.07	122.21	121.67	120.65	132.12	118.17	115.01
37	100.00	119.35	130.97	87.30	115.26	109.40	108.51	112.02	114.50	93.09	106.62	77.37
38	100.00	103.24	105.11	96.58	102.23	98.80	91.28	91.24	86.53	86.77	91.62	88.17

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Unit Value Indexes for Exports and Imports

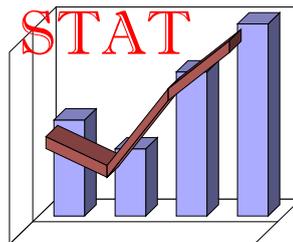
39	100.00	107.02	110.52	109.55	108.87	106.11	107.75	112.44	109.92	113.40	118.12	112.82
40	100.00	103.40	105.74	106.32	106.83	100.73	103.58	106.54	104.21	103.70	110.32	110.62
41	100.00	119.48	91.93	114.12	96.58	102.84	107.56	99.12	92.24	88.00	87.52	84.39
42	100.00	114.36	182.88	167.83	121.95	115.83	110.80	131.70	145.83	123.87	94.81	152.07
44	100.00	100.74	91.78	86.65	85.76	89.23	94.19	92.45	94.28	95.33	90.90	103.11
47	100.00	103.71	107.59	112.93	124.67	134.05	138.08	150.43	144.72	151.41	147.63	143.64
48	100.00	102.20	104.39	97.99	98.06	99.23	95.12	98.57	98.02	98.57	103.32	94.42
49	100.00	104.29	151.40	126.36	100.15	114.39	112.40	136.25	136.73	204.38	183.46	145.28
51	100.00	92.29	89.93	87.04	65.47	71.36	61.89	61.59	61.38	56.42	56.74	54.89
52	100.00	106.39	97.87	95.21	90.60	92.26	94.41	89.66	105.11	100.54	100.97	97.72
53	100.00	76.93	75.46	76.58	77.75	116.59	110.29	121.80	121.17	106.60	127.32	129.60
54	100.00	121.67	118.07	116.40	122.67	124.18	137.24	135.39	132.69	125.47	126.74	120.64
55	100.00	105.69	110.23	102.55	107.58	103.96	104.06	101.56	100.98	97.86	93.45	93.00
56	100.00	107.57	129.79	112.42	117.51	118.76	127.12	129.57	133.16	127.34	136.29	115.96
57	100.00	88.22	142.75	150.00	163.72	105.35	147.08	152.70	151.08	154.61	230.65	211.30
58	100.00	142.29	132.58	130.81	129.34	131.95	132.74	140.14	154.03	154.34	143.89	146.89
59	100.00	104.97	97.73	99.44	126.14	111.13	114.58	118.34	110.64	110.45	127.55	120.72
60	100.00	113.32	102.73	93.05	99.82	108.40	105.00	99.16	100.11	105.97	106.42	106.22
61	100.00	95.31	113.35	117.23	143.98	169.95	178.92	157.11	146.54	119.77	165.63	96.82
62	100.00	82.27	109.25	138.84	118.76	110.03	139.46	149.13	146.84	122.90	128.52	100.37
63	100.00	125.09	98.00	67.99	78.98	82.26	77.24	71.22	101.16	80.58	81.67	81.73
64	100.00	108.08	116.28	102.22	136.53	78.22	92.19	96.00	118.65	113.05	111.34	104.09
65	100.00	56.22	101.64	45.81	93.70	42.91	26.45	50.86	28.85	78.70	33.52	78.60
68	100.00	103.44	122.25	118.35	136.27	155.41	178.18	207.28	187.50	192.56	207.67	202.03
69	100.00	101.80	164.16	124.44	114.34	133.08	167.58	177.99	173.68	150.60	155.87	156.12
70	100.00	100.98	101.09	104.25	102.30	101.61	114.37	121.08	117.32	112.17	119.76	131.05
71	100.00	92.47	44.19	39.23	35.54	40.41	36.08	36.45	28.27	13.23	14.42	18.08
72	100.00	101.27	104.99	103.80	106.76	106.42	103.13	105.23	104.27	102.79	102.19	100.26
73	100.00	102.72	113.43	102.39	106.76	116.33	118.64	116.91	121.91	116.42	131.48	124.38
74	100.00	98.78	119.46	104.32	108.59	97.31	100.39	107.33	112.58	101.46	105.99	103.00
75	100.00	182.52	197.98	234.31	252.94	211.61	322.36	325.69	459.66	382.73	301.75	253.54
76	100.00	105.91	107.80	102.42	124.61	119.82	121.64	119.06	111.46	112.89	114.94	109.06
78	100.00	90.12	54.26	52.01	49.92	63.16	50.67	66.33	68.30	66.54	63.81	62.03
79	100.00	98.07	108.34	71.27	132.97	111.28	120.32	96.49	107.30	108.83	102.98	109.23
80	100.00	130.86	146.07	225.93	148.45	150.49	164.15	244.06	244.88	224.88	200.79	227.37
81	100.00	103.91	97.19	90.56	102.16	109.59	107.39	84.93	107.46	89.93	37.42	57.93
82	100.00	144.09	154.21	134.57	133.14	101.46	119.63	113.77	106.40	110.15	134.62	108.50
83	100.00	115.92	125.15	114.35	93.38	99.13	118.35	130.85	130.09	120.98	104.49	134.04
84	100.00	123.89	138.19	127.64	127.44	118.27	126.88	128.53	120.76	121.67	134.81	127.32
85	100.00	110.94	126.13	110.86	109.58	100.45	110.32	112.59	120.05	112.63	111.26	104.72
86	100.00	69.62	19.59	49.30	33.44	68.23	96.10	179.74	116.70	121.46	308.50	336.18
87	100.00	98.46	109.00	118.90	111.14	105.59	99.14	104.45	103.52	96.44	107.77	101.55
89	100.00	167.04	84.28	98.01	78.84	108.27	35.64	47.44	85.55	153.72	240.61	108.92
90	100.00	105.25	130.41	98.35	85.36	73.77	74.75	76.88	72.93	66.94	86.65	75.31
91	100.00	127.20	138.59	130.88	210.93	180.49	192.18	199.96	202.28	234.51	219.09	244.91
92	100.00	106.17	120.80	79.35	102.06	126.43	170.43	176.89	237.10	234.96	255.30	238.39
94	100.00	102.21	123.94	132.53	128.93	134.71	146.98	212.63	200.92	167.03	161.73	145.03
95	100.00	85.15	104.71	116.12	113.88	92.01	84.25	86.57	86.77	78.72	76.70	66.58
96	100.00	127.54	141.49	112.79	132.23	122.77	145.52	147.12	163.53	143.17	133.46	131.80

CLASSIFYING MANUFACTURING PRODUCTION BY COMMODITY VS BY ESTABLISHMENT: EVIDENCE USING 1998 ANNUAL SURVEY DATA

Report # 40
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by
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I. INTRODUCTION

The Annual Manufacturing Survey, which currently covers over 21,000 large and medium establishments, has been the primary data source for any analysis of the structure of manufacturing industries since 1975. Volumes have been written analyzing changes in composition, efficiency and productivity for establishments by industry, size, geography, ownership and other dimensions. All these analyses take one thing for granted: the classification of establishments by industry. Less known perhaps to many users is the method used by BPS for classifying establishments by individual industry. Although the questionnaire has by and large contained the same questions every year, data related to components of the establishment output and inputs were not coded prior to the 1998 survey. They were simply manually processed by the Industry Directorate (formerly Bureau) and published by commodity or commodity groups (in Volume III of "Survei Industri"). In the 1998 survey, however, these components were coded for the first time, and are available in computerized form, allowing a matching of individual commodities with individual establishments.¹

How are establishments classified by BPS? The answer is simple: in accordance with the United Nations recommendations which date back to the 1960s and were most recently revised in 1990. Based on these recommendations, the economic sector of activity of an establishment (according to the International Standard Industrial Classification, ISIC) is determined by the class of ISIC in which the principal activity is included.² The principal activity is defined as that which makes up the largest share of the establishment's output value. For example, if an establishment produced the following three products in a given year:

Manufactured goods which sold for Rp. 60 million;
Resale of traded goods for Rp. 15 million and
Consulting services from which revenues were Rp. 25 million,

that establishment would be classified in the manufacturing sector, despite having trading and services activities. Thus the whole output of the establishment would be attributed to manufacturing. By the same token, if a manufacturing establishment, for example, produced the following three types of goods in a particular year:

¹ Another relevant addition introduced for the first time in the 1998 Annual Survey is the new ISIC classification based on the third UN revision (*International Standard Industrial Classification of All Economic Activities. Third Revision*, UN Statistical Papers Series M No. 4, Rev. 3, 1990), which allows better coordination with other classifications such as the Harmonized Commodity Description and Coding System (HS), the Standard International Trade Classification (SITC) and the Central Product Classification (CPC). The previous ISIC classification used by BPS was based on the second revision which dates back to 1968. To maintain historical comparability, the 1998 Annual Survey data include both old and new ISIC classification codes for every establishment.

² *Ibid.*, p 27.

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Rattan products (ISIC 20104) which sold for Rp. 50 million;
Paper products (ISIC 21014) which sold for Rp. 20 million and
Batik (ISIC 17124) which sold for Rp. 10 million,

that establishment would be classified in the “rattan” industry. Its whole production, for which the value is Rp. 80 million, would be attributed to that industry. In other words, the ISIC-level aggregate for “rattan” refers not to the *value of rattan production* but to the *value of production of rattan-producing establishments*, that is establishments for which the principal economic activity is the production of rattan.

One implication of using such a procedure is that output (or employment) of rattan-manufacturing *companies*³ may be different than output (or employment) of rattan-manufacturing *establishments* because the former includes output (employment) of establishments not classified in rattan manufacturing and it excludes output (employment) of establishments that manufacture rattan but are not owned by rattan-manufacturing companies. Despite its weaknesses, this methodology, which is a practical compromise enabling countries to produce comprehensive results in a relatively timely manner, represents the standard international practice in this area.

The availability of coded commodity data in the 1998 Annual Manufacturing Survey provides an opportunity to determine whether, in the case of non-oil manufacturing sector data in Indonesia, classification based on individual commodities provides an additional useful analytical tool to users and whether results using this classification differ significantly from those currently produced at different levels of aggregation. This is the issue addressed by this paper.

II. COMMODITY CODES

A. Why Were They Added?

Demand for data on production and use of particular manufacturing commodities has always been strong among users in Indonesia. That is why BPS has historically devoted substantial resources to tabulate such data extracted from the Annual Manufacturing Survey, which culminate in the production of a separate volume of its annual “Survei Industri” publication. The procedure used in the past for extracting such data, which started with the 1975 survey, was manual. Based on past experience, BPS Industry Directorate staff would compile an arbitrary list of standardized commodity names similar to (but much shorter than) the Standard International Trade Classification (SITC) used in classifying commodities traded among countries. Commodity names reported by every establishment would be matched against this list.

³ Companies may include more than one establishment owned by the same legal entity, and they may be classified on the basis of the principal industry of all their establishments.

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Any new type of commodity listed would be added to the current year's list, which would be used as the base list for the subsequent year. Relevant data reported by an establishment would then be entered into their corresponding commodities.

Needless to say, in addition to being highly time-consuming, the manual nature of this procedure was prone not only to entry error (at every stage) but more importantly to coding error. Incomplete descriptions by the establishment left room for interpretation on the part of questionnaire editors. If an establishment reported "jackets", for example, it was up to the editor to determine to which commodity group that corresponded: "leather jackets", "sports jackets", "life jackets", "denim jackets" etc. All these categories refer to different types of commodities which feed into different classes of economic activity. Most difficult, and thus most arbitrary, was what to do with commodities reported solely with a numeric code, e.g. TK 75-1350, NBR 6850. Although the former case can be easily remedied with an exhaustive computerized commodity list, the latter inevitably requires some judgement on the part of the editor.

This manual system seemed to work in early years, despite delays in publishing data and the high likelihood of error in published estimates. But with the substantial increase in the number of establishments over the years (21,423 in 1998 vs 7,469 in 1975), and the exponential increase in corresponding commodities (44,732 in 1998 vs 1,249 in 1975), the burden for tabulating commodity data increased dramatically, forcing the Industry Directorate to find ways to produce these tabulations but with significantly less resources.

B. How Was it Done?

That opportunity came around March, 1999 when BPS published *Klasifikasi Komoditi Indonesia* (KKI) for the manufacturing sector, which produced 9-digit commodity codes based on the third ISIC revision. The timing was perfect, as it corresponded to the first stages of processing of the 1998 Annual Survey data. Despite problems discovered with the KKI classification, using such codes rather than reported commodity names was far more reliable. Moreover, while the Industry Directorate realized that, as is the case with any newly adopted procedure, initial results will not be fully satisfactory, it also believed that the benefits of using it were significant and that they outweighed any potential cost by a significant factor.

Because that was the first time that such coding was done, the procedure had to be implemented with particular care. Commodity names were first entered as they appeared in the questionnaire. The processing staff, who were assigned different industries based on their knowledge of, and experience with, particular industries, then manually entered the name and KKI code of the commodity group which corresponded most closely to the name in the questionnaire. By entering both KKI names and original names, the possibility of revising the code in the future remained open if future information dictated it. The only commodities which were left with no corresponding KKI code were those which had an indecipherable technical

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name (e.g. TK 75-1350, NBR 6850, Medium NF 1095). These names were kept as reported and tabulated with their original names in the published volumes but were not assigned any KKI code in the computerized data files.

III. RESULTS

A. Value of Production

To what extent does the value of production differ using the classification by commodity from that using the classification by establishment? The answer may be provided in what is often referred to as the “make” (or supply) table, which constitutes one of the standard Input-Output Accounts produced by various countries. Table 1 provides a modified version of the make table (by 2-digit ISIC), covering only “production” rather than all components of output (e.g. inventory changes, output of services etc.), as the standard make table does.

Column entries refer to the value of production of establishments classified in the particular 2-digit ISIC and row entries refer to the value of commodities which belong to a particular 2-digit ISIC. For example, the total value of production of establishments classified in ISIC 15 (“Food & Beverages”) is Rp. 62,486 billion (column total), and the total value of commodities which belong to ISIC 15 is Rp. 59,307 billion (row total). Thus one can see that not all the value of production assigned to ISIC 15 using the standard international practice (Rp. 62,486 billion) consisted of food and beverage items: some were items which belonged to ISIC 16 (Rp. 1 billion), others belonged to ISICs 17 (Rp. 2 billion), 19 (Rp. 30 billion), 20 (Rp. 3 billion), 24 (Rp. 940 billion) etc., and others did not belong to any of the 2-digit ISIC categories of manufacturing because they were non-manufacturing items or items which could not be classified (e.g. if they were reported by an indecipherable technical name). Since every establishment has to be classified into a particular ISIC (by at least identifying its principal commodity) whereas every commodity need not (since some may be secondary commodities), the column labeled “Other” ISICs does not contain any positive entries. It was kept in the table to produce a symmetric matrix and to enable easy identification of the diagonal cells, which show the value of production of commodities which constitute the principal activity of establishments producing them.

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Table 1
Non-Oil Manufacturing Modified Make Table of Large and Medium Establishments for 1998 (billion Rp)

ISIC	INDUSTRY																				Ot h	Total			
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34			35	36	37
15	5883		2		2	0	1	1		434	32	0	0	0								0		59307	
16	1	2381									0													23817	
17	2		4001	1681	6	6	0	4		5190	84			7			0	16				17	71	47099	
18	0		1128	1184	10		0							0	0							1		12988	
19	30		79	4	1301	5				3	58			0					1			3	0	13200	
20	3		0	0	2	2654	229	0		5	30	20	12	12	0	0	3	0				430		27296	
21	0	13	77	0	15	71	1283	146		162	31	101		26	0			910	19			3		14407	
22	0		4			5	171	7797		0	97			0					1			45		8120	
23									389	80		25	5									0		499	
24	940	0	72		58	5	46	40	42	3236	176	10	72	44	159		7	45	6	0		36		34120	
25	334		119	29	61	17	11	24		122	2362	111	72	34	3		16	163	3		10	322	2	25075	
26	1		1		11	1	2		0	85	28	1016	55	17	0		6		1		0	15		10386	
27	1		36		1		13			32	0	1	1755	385	18		85	68			3	1		18199	
28	COMMODITY		9	1	22	10	2	1		0	8	17	1734	6634	84		181	4	4	2	20	253		8985	
29	4		0	4	2	1	6	0		9	21		114	56	3586		30	13		62	1	20		3929	
30															0	4								4	
31								0			4	135	36	200	9		5814	173		61	6	1		6439	
32			0			0	4				14	11	22		131	0	17	1081		2	0	4		11017	
33			4				167	2	0	102	5		0	15	16		3		1401			18		1732	
34						1	0	0	3	4	4		0	5	35		36	35		2803	100	3		3028	
35						0				0	12	0	0	889	7		4	4		97	5625	17		6657	
36	2		7	39	5	261	65	8		18	147	2	3	130	22		4	50	361	2	4	1024		11372	
37	20									24	5											1	97	148	
Other	2313	46	2788	903	242	759	871	328	27	1313	824	611	1920	1664	636	5	529	1085	266	707	4613	871	3	44910	
Total	6248	2387	4434	1450	1345	2769	1441	8351	461	5176	2520	1120	2160	1011	4705	10	6733	2314	2061	3736	1040	1235	103	0	392734

Notes: Columns refer to the value of production by industry (summed up over establishments) and rows to the value of production by commodity. Production is valued at producer prices. Because only "production" is measured (rather than "output"), the table is not a standard make table. Given space limitations, the table did not identify sector names. Refer to Table 4 for these names. Column totals may differ slightly from published figures because of data cleaning since publication. Totals may not add up to the sum of detailed entries due to rounding.

An alternative and useful way of looking at numbers in Table 1 is in terms of coefficients, in order to capture at a glance the relative magnitude of various cells in particular columns. Table 2 provides a matrix of column ratios derived from Table 1. Note, for example, that:

- Diagonal entries constitute the largest coefficients for all but a handful of sectors, suggesting that for the majority of 2-digit ISICs, sectoral distributions using the classification by commodity vs by establishment would not differ substantially.
- The flip side is that for sectors where the diagonal entry is relatively small (ISICs 30 and 32), results would differ significantly using the two classifications.
- However, in those cases where the diagonal entry is relatively small, the reason appears to be that a large proportion of

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commodities assigned to that particular ISIC could not be classified (“Other”).

Table 2
Non-Oil Manufacturing Modified Make Table Coefficients of Large and Medium Establishments for 1998

ISIC	INDUSTRY																										
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37				
15	0.94									0.01																	
16		1.00																									
17			0.90	0.12						0.10														0.01			
18			0.03	0.82																							
19					0.97																						
20						0.96	0.02									0.02							0.03				
21							0.89	0.02				0.01						0.04	0.01								
22							0.01	0.93																			
23									0.84																		
24	0.02								0.09	0.63	0.01					0.03											
25	0.01										0.94	0.01						0.01					0.03	0.02			
26												0.91															
27													0.81	0.04				0.01									
28													0.08	0.66	0.02		0.03						0.02				
29													0.01	0.01	0.76						0.02						
30																0.43											
31												0.01		0.02				0.86	0.01		0.02						
32															0.03	0.05		0.47									
33							0.01												0.68								
34								0.01							0.01		0.01				0.75	0.01					
35														0.09							0.03	0.54					
36						0.01					0.01			0.01					0.18				0.83				
37																									0.95		
Other	0.04		0.06	0.06	0.02	0.03	0.06	0.04	0.06	0.25	0.03	0.05	0.09	0.16	0.14	0.50	0.08	0.47	0.13	0.19	0.44	0.07	0.03				
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		

Note: Columns refer to the value of production by industry (summed up over establishments) and rows to the value of production by commodity. Coefficients for a particular column are defined as the ratios of the cell content (in Table 1) and the column total (in the same table).

Having established the commodity vs industry inter-relationships, we will then try to focus on the column and row totals of Table 1 to illustrate the distributional consequences of the two classifications. The following section computes the value of production using the two classifications and compares the results at the 5-, 3- and 2-digit ISIC levels respectively.

1. 5-Digit ISIC

Because of the large number of 5-digit ISICs, detailed results are provided in Appendix A (Table A.1), but the most important results are summarized in Tables 3 and 4. The following points are worth noting:

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- The number of 5-digit sub-sectors in manufacturing (ISIC 15-37) with a positive value of production is smaller using the establishment classification (333 sub-sectors) than it is using the commodity classification (355 sub-sectors). In other words, twenty-two sub-sectors (among them, for example, ISIC 15212, 19113, 20390, 20520) consist of commodities which do not reflect the primary activity of any establishment in manufacturing.
- Five sub-sectors (ISIC 22301, 29114, 29212, 29264, 33123) have at least one establishment but show nothing produced. These establishments would have been involved in an activity which is not classified as “production”, but rather as a “service” (“makloun”). As such, these establishments do not purchase intermediate inputs for the purpose of producing their own product. Rather, they are given the inputs by another establishment, and they simply process them and deliver the final product to that other establishment. Thus, they are technically not engaged in manufacturing “production”. Their activity is simply classified as a manufacturing “service” to be considered as part of manufacturing “output” (not manufacturing “production”).
- Differences in production levels are significant (Table 3): 57% of ISICs show a difference higher than 20%, and 34% show a difference of 50% or more. Only three (out of 358) ISICs have the same level of output using both classifications.
- The distribution of the difference is naturally more heavily influenced by the high end than the low end (since there is no limit to the size of the difference on the high side but the low end is limited to 100%), giving an average difference of 60 times. However, the number of ISICs with differences on the positive side (52% of all ISICs) is comparable to that on the negative side (47% of ISICs), producing a median difference of only 1.9%.

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Table 3
Frequency Distribution of Differences in Classification for 5-Digit ISICs

Production Classified by Establishment / Production Classified by Commodity	Number of 5-Digit ISICs	Percent of 5-Digit ISICs
< 0.5	61	17.0%
0.5 - 0.599	4	1.1%
0.6 - 0.699	17	4.7%
0.7 - 0.799	16	4.5%
0.8 - 0.899	27	7.5%
0.9 - 0.999	44	12.3%
1	3	0.8%
1.01 - 1.099	53	14.8%
1.1 - 1.199	26	7.3%
1.2 - 1.299	17	4.7%
1.3 - 1.399	14	3.9%
1.4 - 1.499	12	3.4%
>=1.5	64	17.9%
Total	358	100.0%

Average difference: 60 times
 Median difference: 1.9%

- For 47% of ISICs (i.e. sub-sectors showing a ratio lower than 1 in Table 3), the reported figures for value of production are lower than the actual value of commodities produced. Actual production of “knitted socks” (ISIC 17303) and “preserved wood” (ISIC 20102), for example, was higher than reported published figures because many establishments produce these commodities as minor items rather than as their main products. By the same token, the actual value of production of “wheat flour” (ISIC 15321) and “granulated sugar” (ISIC 15421) was lower than reported published figures because reported figures include the value of other commodities produced by establishments whose primary commodities were “wheat flour” and “granulated sugar” respectively.
- The largest sub-sectors were generally little affected: of the 33 sub-sectors with a share exceeding 1% of total non-oil manufacturing (using the establishment classification), only nine showed a change in share exceeding 0.5 percentage points, and only one (ISIC 32300, “Radio, TV, sound & video recording”) showed a highly significant change in share (a decline of 2.9 percentage points). The reason for the dramatic change in the share of ISIC 32300 is presumably that many of the commodities reported by establishments were provided in a format which did not allow a clear classification into a particular 9-digit KKI (or 5-

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digit ISIC). At the commodity level, they remained “unclassified”, but at the establishment level they were assigned to the same ISIC as that of the main commodity produced by the establishment.

- The number of “unclassified” commodities (2827) is not trivial: it constituted 6% of the total number of commodities. Their production value was significant: 11% of the total. These are commodities for which the reported description could not be clearly classified into any 5-digit ISIC.

- Sub-sectors were understandably not affected evenly by the change in classification. Table 4, which shows how many 5-digit ISICs within each 2-digit ISIC were affected by more than 20%, shows that recycling (ISIC 37), wearing apparel (ISIC 18), paper (ISIC 21) and machinery and equipment (ISIC 29) had the largest percentage changes in the number of 5-digit ISICs with more than a 20% difference.

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Table 4
Distribution of Sub-Sectors With More than 20% Difference Between the Two Classifications

2-Digit ISIC	Description	Number of 5-Digit ISICs With > 20% Difference (1)	Total Number of 5-Digit ISICs in this Sector (2)	Percentage (1) / (2)
15	Food & beverages	21	61	34%
16	Tobacco	3	5	60%
17	Textiles	21	28	75%
18	Wearing apparel	4	5	80%
19	Leather tanning	6	11	55%
20	Wood	9	17	53%
21	Paper	7	9	78%
22	Printing & publishing	6	10	60%
23	Coal & refined petroleum	3	5	60%
24	Chemicals	23	35	66%
25	Rubber & plastics	4	15	27%
26	Other minerals	15	31	48%
27	Basic metals	6	9	67%
28	Fabricated metal	13	19	68%
29	Machinery & equipment	23	30	77%
30	Office machinery	2	3	67%
31	Electric machinery	9	13	69%
32	Radio/TV equipment	2	3	67%
33	Medical instruments	7	12	58%
34	Motor vehicles	2	4	50%
35	Other transport equipment	9	13	69%
36	Other manufacturing	8	18	44%
37	Recycling	2	2	100%
Total		205	358	57%

2. 3-Digit ISIC

As 5-digit sub-sectors are aggregated into 3 digits, differences between the two classifications become less pronounced: as Table ? shows, the sectoral distribution of both classifications does not change significantly, with the exception of three sub-sectors: “industrial chemicals”(241), “synthetic fiber”(243) and “radio, TV, sound & picture recording”(323). That probably reflects the fact that several of these commodities do not constitute the primary activity of many establishments.⁴ Note that the median difference remains virtually at the same level as that of the 5-digit ISICs (2% vs 1.9% in the 5-digit case).

⁴ Despite the size of the “unclassified” category of commodities, its impact on the sectoral distribution is not significant. For lack of any better assumption, if one simply distributes these commodities proportionately to the other sectors, the conclusion remains the same. The only exception is that ISIC 171 (and by extension 17) shows a significant change in share.

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3. 2-Digit ISIC

Aggregation at the 2-digit ISIC (Table 5) reflects the same phenomenon as the 3-digit aggregation, although the median difference in this case is far larger than before (7.9%). Note that the only significant differences in relative shares are in the same sectors identified in the previous section.

Table 5
Value of Production by 2-Digit ISIC Using Classification By Commodity vs By Establishment

ISIC	Description	By Commodity		By Establishment		Est/Com (3) / (1)
		Production (bn Rp) (1)	Share (2)	Production (bn Rp) (3)	Share (4)	
15	Food & beverages	59.3	15.1%	62.5	15.9%	1.054
16	Tobacco	23.8	6.1%	23.9	6.1%	1.002
17	Textiles	47.1	12.0%	44.3	11.3%	0.941
18	Wearing apparel	13.0	3.3%	14.5	3.7%	1.117
19	Leather tanning	13.2	3.4%	13.5	3.4%	1.019
20	Wood	27.3	7.0%	27.7	7.1%	1.014
21	Paper	14.4	3.7%	14.4	3.7%	1.001
22	Printing & publishing	8.1	2.1%	8.4	2.1%	1.028
23	Coal & refined petroleum	0.5	0.1%	0.5	0.1%	0.925
24	Chemicals	34.1	8.7%	51.8	13.2%	1.517
25	Rubber & plastics	25.1	6.4%	25.2	6.4%	1.005
26	Other minerals	10.4	2.6%	11.2	2.9%	1.079
27	Basic metals	18.2	4.6%	21.6	5.5%	1.187
28	Fabricated metal	9.0	2.3%	10.1	2.6%	1.126
29	Machinery & equipment	3.9	1.0%	4.7	1.2%	1.197
30	Office machinery	0.0	0.0%	0.0	0.0%	2.277
31	Electric machinery	6.4	1.6%	6.7	1.7%	1.046
32	Radio/TV equipment	11.0	2.8%	23.1	5.9%	2.101
33	Medical instruments	1.7	0.4%	2.1	0.5%	1.190
34	Motor vehicles	3.0	0.8%	3.7	1.0%	1.234
35	Other transport equipment	6.7	1.7%	10.4	2.6%	1.562
36	Other manufacturing	11.4	2.9%	12.4	3.1%	1.087
37	Recycling	0.1	0.0%	0.1	0.0%	0.695
	Unclassified	44.9	11.4%	0.0	0.0%	0.000
	Non-manufacturing	0.0	0.0%	0.0	0.0%	0.000
Total	Non-oil manufacturing	392.7	100%	392.7	100%	1.000
	Average ratio estab./commodity					1.192
	Median ratio estab./commodity					1.079

Figures may differ slightly from published ones because of data cleaning since publication.

B. Output vs Intermediates

Coding of individual commodities used as intermediate inputs allows users to analyze the structure of production of various industries. Table 6 provides an example of the type of tool that

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can be produced: a cross-tabulation of intermediate inputs by origin (row) and destination (industry). The table covers a subset, rather than the full range, of the standard input-output “use” table. More specifically:

- It only covers the non-oil manufacturing sector, rather than all sectors of the economy.
- It only covers input use by large and medium establishments, whereas the comparable portion of the standard use table covers establishments of all sizes.
- It only covers intermediate inputs, whereas the standard use table covers primary inputs as well.

Despite its more limited coverage, Table 6 provides a substantial amount of valuable information for analytical use. As was done in the previous section, coefficients derived from Table 6 are provided in a separate matrix (Table 7).

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Table 6
Non-Oil Manufacturing Intermediate Input Use by Large and Medium Establishments for 1998 (billion Rp)

ISIC	INDUSTRY																							Oth.	Total
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
15	1825	71	586	55	21	639	331	25	57	1470	11	4	102	9	0	1		0	0	8	16		28	21692	
16	1	5950					84			0	0													6035	
17	93	1	1680	5040	947	182	387	5	1	1300	851	4	0	12	1	16	102	9	65	19	499		63	26396	
18	0		1	4	3	0	0	1			2								1	9	10			31	
19			210	444	2170	4	1	0		15	58	1		4	5	14	7	496	34	2	35	0		3500	
20	2	0	0	0	14	4670	9	0	11	125	104	0	1	116	2	0	9	0	1	18	1570		0	6653	
21	419	1310	224	76	154	302	1500	2900	4	210	79	111	1	7	16	30	221	8	6	4	163		1	7745	
22	10	54	2	2	0	0	22	4		42	26	2		1	0	0	1	26		2	0	5		199	
23	22		140	2	43	12	23	8	20	1800	276	17	11	10	5	0	32	4	0	100	31	6	1	2563	
24	5225	182	6760	393	1120	5600	3080	520	16	1110	5200	730	2370	850	95	0	626	383	119	274	1160	1780	24	299	47906
25	50	1	151	375	600	53	70	17	1	138	8080	4	498	35	18	0	110	61	4	30	16	131	1	1	10445
26	205		1	1	1	1640	35	0	7	109	27	992	140	110	6	31	10	5	19	22	283	0	6	3650	
27	61	65	1	3	3	6	64	3	0	115	105	72	6960	2300	277	1	992	126	108	228	2820	285	27	14621	
28	6		69	288	28	73	34	15	1	148	631	17	159	657	45	0	324	339	47	19	193	302	0	25	3419
29	0		1	0	2	33	2	7		17	11	1	19	47	456		9	223	11	5	11	9		2	866
30	INTERMEDIATE INPUTS																								3
31			0	10	0	0		1		1	2	0	7	6	6	0	477	601	1	15	40	19		1	1186
32			0		0	0					4	3		14	10	1	140	4810	0	36	0	1		3	5024
33	16	65	17		0		2	0		419	2	20	7	0	2		1	0	29	1	0	82		1	664
34	0				7					9	39		1	0	2		1	0	0	159	68	5	0		291
35					0		0	0	3	68	0	327	17	7		10	200		11	1560	18	0	4	2225	
36	0		491	973	51	27	4	0		220	79	15	1	5	0	116	0	12	0	14	751		88	2850	
37	602	2	22	0	11	0	621	7		539	136	2	3	77	0	0	7	16	0	21	14	26	0	2108	
Othe	1068	34	87	6	141	173	58	0	8	222	354	271	62	7	1	12	66	0	15	4	22	0	1	12226	
Total	3565	7734	2556	7671	5315	1341	6327	3514	125	1800	1614	2267	1066	4284	954	3	2943	7195	867	1023	6020	6006	52	553	182296
Product.	6248	2387	4434	1450	1345	2769	1441	8351	461	5176	2520	1120	2160	1011	4705	10	6733	2314	2061	3736	1040	1235	103		392734
Inp./Pro	57%	32%	58%	53%	40%	48%	44%	42%	27%	35%	64%	20%	49%	42%	20%	26	44%	31%	42%	27%	58%	49%	50%		46%

Note: Cells refer to the value of intermediate inputs belonging to a particular ISIC (rows) and used by establishments belonging to a particular ISIC (column). Intermediate inputs are valued at purchaser prices. Totals may not add up to the sum of detailed entries due to rounding.

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Table 7
Non-Oil Manufacturing Intermediate Input Coefficients of Large and Medium Establishments for 1998

	INDUSTRY																												
ISIC	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	Other					
15	0.51	0.01	0.02	0.01		0.05	0.05	0.01	0.45	0.08			0.01											0.05					
16		0.77					0.01																						
17			0.66	0.66	0.18	0.01	0.06		0.01	0.07	0.05						0.01	0.01	0.01	0.06			0.08		0.11				
18				0.00																									
19			0.01	0.06	0.41										0.01					0.57	0.03		0.01						
20	0.01					0.35			0.09	0.01	0.01			0.03									0.26						
21		0.17	0.01	0.01	0.03	0.02	0.24	0.83	0.03	0.01		0.05			0.02		0.01	0.03	0.01	0.01			0.03						
22		0.01						0.00																					
23	0.15		0.01		0.01				0.16	0.10	0.02	0.01			0.01		0.01				0.10	0.01							
24		0.02	0.26	0.05	0.21	0.42	0.49	0.15	0.13	0.62	0.32	0.32	0.22	0.20	0.10	0.05	0.21	0.05	0.14	0.27	0.19	0.30	0.47	0.54					
25	0.01		0.01	0.05	0.11		0.01		0.01	0.01	0.50		0.05	0.01	0.02	0.01	0.04	0.01		0.03		0.02	0.01						
26						0.12	0.01		0.05	0.01		0.44	0.01	0.03	0.01		0.01		0.01	0.02		0.05		0.01					
27		0.01		0.04		0.01			0.01	0.01	0.03	0.65	0.54	0.29	0.44	0.34	0.02	0.12	0.22	0.47	0.05			0.05					
28					0.01	0.01	0.01		0.01	0.01	0.04	0.01	0.01	0.15	0.05		0.11	0.05	0.05	0.02	0.03	0.05			0.05				
29														0.01	0.48			0.03	0.01										
30	INTERMEDIATE INPUTS																0.12												0.01
31															0.01		0.16	0.08		0.01	0.01								
32		0.01													0.01	0.38	0.05	0.67		0.04					0.01				
33										0.02		0.01								0.03			0.01						
34																				0.16	0.01		0.01						
35													0.03		0.01			0.03		0.01	0.26				0.01				
36			0.02	0.13	0.01					0.01		0.01					0.04		0.01			0.13			0.16				
37	0.02						0.10			0.03	0.01			0.02					0.02					0.51					
Other	0.30				0.03	0.01	0.01		0.06	0.01	0.02	0.12	0.01					0.01		0.01					0.00				
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				

Note: Input coefficients for a particular column are defined as the ratios of the cell content (in Table 6) and the column total for intermediate inputs (in the same table).

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IV. CONCLUSIONS

The above discussion points to a number of interesting conclusions for users of manufacturing sector data:

- First, by allowing matching of individual commodities produced and used, the coded commodity data provide users with primary data on various aspects of an establishment's production and cost structure. This allows the user to minimize the use of proxies and guesswork and therefore improve the quality of the resulting analyses.
- Different types of analysis require different types of aggregation. Analyses which require commodity-based classifications could not be done in the past without resort to assumptions regarding correspondences of commodities to ISICs. Now they can be done based on data rather than assumptions.
- Users interested in analyzing structural changes in manufacturing can now obtain on an annual basis subsets of non-oil manufacturing make tables and intermediate input-output tables (similar to Tables 1 and 6 above) rather than wait for the full input-output table to be produced by BPS once every five years. These tables may be also produced at different ISIC levels.
- One implication is that BPS may want to publish additional tabulations similar to those produced in this paper and possibly at different levels of aggregation (e.g. 2-, 3- or 5-digit ISIC). An evaluation of the costs and benefits of such an activity can determine whether it is worthwhile to pursue on a regular basis. But if these tabulations are published, one must stress that they should be done as a supplement to, not a substitute for, the current establishment-based calculations.

In any case, even if such tabulations are not published, users with access to the computerized files can use these data in any way they see fit.

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APPENDIX A
5-DIGIT ISIC TABULATION

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APPENDIX B
QUESTIONNAIRE FOR 1998 ANNUAL SURVEY

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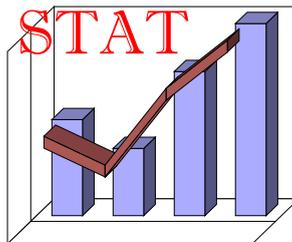
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MEASURING CHANGES IN INVENTORIES IN INDONESIA

Report # 42
Statistical Paper # 11

by
Frank de Leeuw

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I. INTRODUCTION

Direct measurement of changes in inventories, wherever possible, is preferable to the procedure followed in many countries (including Indonesia) of deriving inventory changes as a residual between total production and final sales. One advantage of direct measurement is that the inventory change estimates themselves should improve. When they are residuals, they reflect not only actual inventory change, but also errors in measuring production and final sales. Improved estimates based on direct measurement should enable a better understanding of the magnitude and the timing of inventory change in economic fluctuations.

Perhaps even more important, at least in Indonesia, is the potential advantage of improving estimates of private consumption, the largest component of final expenditures. If direct estimates are available for fixed investment, net exports, government consumption, and inventory change, then private consumption can be estimated as a residual between value added and these non-consumption components of final demand--the so-called "commodity flow" approach. The commodity flow approach can be applied selectively; some categories of consumption can be estimated using commodity flow, and others can retain the present methodology of interpolating consumption estimates between household surveys conducted every three years. The commodity flow approach should be more accurate for many categories, especially for goods and services for which fixed investment and net exports are of little importance.

But how can BPS measure changes in inventories directly? Three sources of information should prove useful: (1) data on inventories in physical units (kilograms, barrels) for selected commodities; (2) data on the value of inventories on the balance sheets of enterprises; and (3) short-run indicators related to inventory investment, such as responses to business tendency survey questions about the direction of change in inventories. The first two sources ought to account for a large proportion of total inventory changes in the economy from year to year. The third source should be helpful in interpolating quarterly estimates between annual benchmarks.

The next three sections of this report will focus on these three sources. For each source, the report will discuss (1) what *basic information* seems to be available; (2) the *methodology* of converting that information into inventory change estimates for the national accounts (including what supplementary data and assumptions are necessary for such conversion); and (3) what *next steps* would seem most useful in improving the basic information and improving the methodology.

Following these three sections is a section on coverage. It mentions the possibility of overlap between the first two sources. It then focuses on areas of inventory change that are not covered by existing sources and what next steps could help to fill this gap.

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The final section summarizes the main points of the report, presents a table (Table 4) listing all of the “next steps” of the earlier sections, and discusses priorities.

II. PHYSICAL INVENTORY DATA

A. Basic Data

Inventories in physical units such as tons or barrels or kilograms are available for petroleum products, other minerals, major crops, and livestock. The annual change in inventories for these commodities in physical units is simply the difference between successive year-end levels.

Table 1 shows data on physical inventories for selected time periods for 17 products. That so many products have stock data is encouraging; but there are important gaps in the information. Data are shown for only three agricultural commodities (rice, wheat, sugar); and even for these three there are only a few entries in the table. The table does not include any entries since 1998, though quite possibly such data do exist.

The table does not include data on livestock and other farm animals. Inventories of farm animals, however, do fall within the scope of the national accounts.¹ If data on populations of livestock and other farm animals are available, population change multiplied by average unit value should be included as a component of in-process inventory change.

¹ Treatment of livestock may be somewhat confusing (and was explained incorrectly at a meeting at BPS in July 2001). Some may believe that livestock, like natural forests, falls outside the scope of the national accounts until conversion to consumable products. That view is incorrect; according to *System of National Accounts 1993*, “the natural growth of plants, trees, and livestock, including farmed fish, is included within the production boundary *when it is carried out under the direct control, responsibility, and management of an institutional unit....* Any ... livestock that have not yet been ... slaughtered at the end of the accounting period constitute work-in-progress [inventories]....” (SNA 1993, 10.106-10.107; italics added).

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B. Methodology

One advantage of using data on physical inventories is that the methodology for converting the data to national accounts estimates is very simple. All that is necessary is to multiply the change in units from the beginning to the end of a year by the annual average unit value. For inventory change in current prices, the unit value should be the average for the current year. For inventory change in constant prices, the unit value should be the average for a base period--for example, the average unit value for the year 2000 in order to measure inventory change in 2000 prices. Thus, unit values are the only additional data needed besides the inventory data themselves. Table 1 illustrates the methodology for products where the necessary data are available.

This simple procedure--change in physical units times average unit value--does not take account of changes in quality or composition. If the number of tons of a mineral--coal, for example--is the same at the beginning and the end of a year, the procedure will show no change in inventories even if the coal at the end of the year is of a higher average grade than the coal at the beginning of the year. For livestock as well, the average animal at the end of a year may represent more real value than the average animal at the beginning. Where it is possible, disaggregation of a product into two or more classes, with separate unit values for each class, will reduce the importance of the problem.

However, at this stage of statistical development, problems of change in composition can safely be ignored. They are almost certainly of minor importance in measuring the overall change in inventories. For livestock, even *SNA 1993* recommends that "changes in work-in-progress [inventories] for livestock ... may be approximated by changes in the number of such livestock between the beginning and the end of the accounting period multiplied by the average price of the animals or poultry concerned." (*SNA 1993*, 10.108).

C. Next Steps

The next steps in making use of physical inventory data is to fill in, as far as possible, all of the information missing from Table 1, add to the table any additional inventory data available (including livestock and other farm animals), and extend the information beyond 1998. Table 4 in the final section of this report lists these tasks.

III. BALANCE SHEET DATA

A. Basic Data

The value of end-of-year inventories is one item on the balance sheet of an enterprise. In Indonesia, there are at least two sources for such information: values reported in BPS' Annual

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Survey of Manufacturing and balance sheets published by publicly listed corporations, available from stock exchange records. Balance sheet information may be available from other organizations or government agencies besides stock exchanges. A search for such other records could be fruitful.

The coverage of these data centers on manufacturing. The Annual Survey is of course restricted to manufacturing (actually, to medium and large manufacturing establishments). Corporate balance sheets extend beyond manufacturing; however, the data BPS has gathered from the Surabaya stock market seem to cover mainly manufacturing and finance. Since inventory holdings of financial corporations are very small, the Surabaya inventory data reflect mainly manufacturing. They contain very little representation of the trade sector, which has large inventory holdings.

The top part of Table 2 shows inventory data reported in BPS' Annual Survey of Manufacturing, covering the years 1997 through 1999 (the bottom part of the table is discussed below). The first two columns show the number of establishments and their production, in billions of rupiahs. The remainder of the top part of the table shows inventory book values, also in billions of rupiahs.

Inventories are separated into three types; materials inventories, inventories of goods in process, and finished goods inventories. These distinctions will prove important because the methodology of converting balance sheet or book values to national accounts concepts requires price indexes for each category of inventory, and the appropriate price index for the three types could be quite different. For example, for a shoe manufacturer the price of leather might be the principal component of the price index for materials inventories, while the price of shoes would be the principal component of the price index for finished goods inventories. If information is available only for total inventories, an index based on prices of leather and of shoes would be appropriate; but deflation of total inventories by such a price index would be less accurate than separate deflation of each type.

Examination of the table raises questions about some of the entries. Throughout the table there are large differences between closing estimates for one year and opening estimates for the next. For example, the closing estimates for materials inventories in 1997 is 42,279 billion rupiahs, but the opening estimate for the same category in 1998 is only 32,541 billion rupiahs. Furthermore, all of the estimates include values for some establishments that did not report inventories and for which BPS made estimates based on other reported data. There were many more such establishments in 1999 than in earlier years, and examination of individual records reveals that estimates of zero were entered for some establishments. In short, there is need for further work on the basic data.

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B. Methodology

Deriving inventory change estimates for national accounts is far more complex for balance sheet data than for physical inventory data. Unlike physical inventory data, the change in the balance sheet value from year-end to year-end is NOT a useful number, even for measuring inventory change in current prices. The reason it is not useful is that such a change represents *holding gains* (capital gains) as well as *changes in actual production stored in the form of inventories*. The latter is the concept required for the national accounts. Holding gains are excluded from GDP and other production measures because they do not reflect actual production.

A simple example may help explain this important point. Suppose a shoe manufacturing establishment holds exactly the same physical inventories at the end of year "t+1" as at the end of year "t"--the same number of pairs of shoes of each type, the same quantity of leather, etc. The contribution of the establishment to inventory change in the national accounts should clearly be zero, both in current and in constant prices, since the amount of production stored in the form of inventories has not changed. But suppose that prices of shoes and leather have gone up during the year. Then the value of such inventories on a company balance sheet will have increased, according to most commonly used accounting systems.² The increase--a holding gain--will be due solely to price change, and cannot be reduced to zero even if it is deflated by a large price index. Taking the change in balance sheet value is simply the wrong way to start deriving the national accounts concept of inventory change.³

Instead, the basic methodology consists of three tasks:

- *first* (and most complex), express end-of-year inventories for each pair of years in terms of a common price level--that is, prices of 1993, prices of 2000, or prices of some other base year;
- *second*, calculate the change in these deflated inventories, thus estimating inventory change in prices of whatever base year was selected in the first step; and
- *third*, multiply these step 2 estimates (a) by ratios of current-year to base-year price indexes to convert them to estimates in current prices and (b) by ratios of prices in some desired base year to prices in the base year chosen in step 1 (if the two are not the same) to convert them to estimates in constant prices. The following paragraphs explain each step in more detail.

² The LIFO accounting system is the one exception.

³ There is one method of estimating inventory change according to national accounts concepts which does involve taking the change in balance sheet values. In that method, a direct estimate of holding gains is made and subtracted from the balance sheet change. The procedure for estimating holding gains directly is highly complex and will not be explained here, since it seems most unlikely that Indonesia will make use of this method.

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The *first* task requires information, to begin with, on the accounting system underlying the balance sheet values and information on the age distribution of inventories. With respect to the accounting system, the most common rule is to enter each item of inventory at the cost of production or (in the case of materials inventories) the purchase price at the time of entry, and to keep that valuation unchanged until the item is removed from inventory. The exposition that follows will be based on that so-called FIFO accounting rule. For other accounting rules the procedures below would need some modification.

To obtain information on which accounting systems Indonesian firms use, the best procedure would be a representative survey of enterprises every few years. A satisfactory initial procedure, however, would be to interview accounting departments of a few large enterprises and accounting firms, asking the enterprises not only about the valuation rules they follow but also about their impression of the rules that firms in general follow.

With respect to age distribution, the reason such information is necessary is that it determines which price indexes should be used to deflate the level of inventories. If all of the end-of-year inventories were acquired in December, price indexes for December are appropriate; but if one third of end-of-year inventories date back to each of the preceding three months, then averages of price indexes for October, November, and December are appropriate. Again, the best procedure for obtaining such information is a representative survey every few years. Interviews with a few enterprises is an alternative procedure to use initially, but this informal approach is less satisfactory for determining age distribution than it is for determining accounting rules.

A third approach to estimating the age distribution of inventories is to base estimates on the average size of inventory-to-sales ratios. The logic of this approach is as follows: if every finished good stays in inventory half a month, then the ratio of finished goods inventories to monthly sales will be 0.5; if every item stays in inventory for one month, the ratio will be 1.0; etc. (for in-process and materials inventories, the analogous logic will be slightly more complex, involving ratios of raw materials cost to final product value). The problem with the approach is that if different items stay in inventory for different lengths of time, there is no longer any fixed relation between inventory-sales ratios and age distribution. At best, it is possible to derive a number of plausible age distributions from a single inventory-sales ratio. Deriving a few such distributions, however, might be a useful check on the results of the other approaches.

Once information or assumptions about accounting system and age distribution are completed, the next step is to select price indexes for each industry and each category of inventory. The base year of all price indexes selected (i.e. the year in which they are equal to 100) should be the same; any price index that does not have the selected base year should be converted to the selected base year before being used.

For materials inventories, the deflators will generally be components of the wholesale price index. The most recently available input-output tables will provide guidance as to which

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indexes are appropriate and what their weights should be. For finished goods inventories, the appropriate price indexes are either wholesale price indexes or unit value indexes from BPS' quarterly survey of manufacturers. For in-process inventories, a weighted average of indexes for the other two types is appropriate. If total inventories are not separated into materials, in-process, and finished goods, then a weighted average of the appropriate materials price indexes and finished goods price indexes is appropriate.

To complete task one, book values are divided by price indexes, expressing inventories at the end of year "t" and inventories at the end of year "t-1" in prices of the same base year.

Balance sheet data thus require substantial additional information for conversion to the national accounts concept of inventory investment. Information is necessary on (a) the accounting rules businesses follow in entering inventories on their balance sheets, (b) the lag distribution of inventories in the stock at a given time, and (c) price indexes for deflation. If available, separate book values for materials, in-process, and finished inventories are useful.

The *second* task is much simpler than the first. It consists simply of subtracting estimates for year "t-1" from estimates for year "t", with both estimates in prices of the base year selected in step one. The result is a set of estimates of inventory change in constant prices of the base year selected in the first task.

The *third* task is converting the results of the second task into estimates in current and constant prices. For conversion to estimates in current prices, the estimates in constant prices--the results of the second task--should be multiplied by the deflator for the current year (with deflators for the constant-price year equal to 100). No conversion is necessary for estimates in constant prices if the constant-price year desired in this step is the same as the base year selected in task one. If the two years are not the same, then it is necessary to multiply the results of the second task by deflators for the desired constant-price year. For example, if the base year selected in step one is 1993, but it is desired to express the results in prices of 2000, then the results of the second task must be multiplied by deflators for 2000 relative to 1993.

The bottom part of Table 2 shows a set of calculations illustrating the methodology. They are not based on actual information about accounting rules or age distribution or appropriate price indexes, and therefore are of no value as actual estimates of inventory change. They are useful *only* as a simple guide to the methodology.

The first three columns at the bottom of the table show end-of-year inventories in prices of 2000. The columns are based on the simplifying assumptions that (a) businesses record inventories at cost or purchase price at the time they enter the stock and do not subsequently revise these values; (b) end of year inventories were entered in equal amounts in the preceding three months; and (c) the appropriate deflator for all stages is the unit value index for all manufacturing. The first three rows at the bottom of the table thus represent the closing book values at the end of 1997 divided by the ratio of the unit value index for all manufacturing in the

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fourth quarter of 1996 to the average unit value index for all manufacturing in 2000. This ratio is .49768; the corresponding ratios for 1998 and 1999 are .90705 and .91201.

The fourth column at the bottom of the table is the sum of the first three columns. The final column is the year-end to year-end change in the preceding column. The result of the calculation--again, based on unrealistic assumptions--is inventory liquidation during 1998 of 64642 billion rupiahs, and further liquidation during 1999 of 12155 billion rupiahs.

C. Next Steps

Plausible next steps for making use of balance sheet data are listed in Table 4. The first three steps involve collecting basic data and examining them critically. The next two steps are gathering some preliminary rough information about accounting rules and lag distributions. The following step is gathering price data for deflating inventories, and the last step is making some initial pilot calculations based on the work in the previous steps. All in all, the steps add up to a formidable amount of work; accomplishing them will require significant resources and dedication.

IV. SHORT-RUN INDICATORS

A. Availability

The simplest way to produce quarterly estimates of inventory investment is to use the same data sources and methodologies as are used for the year-end estimates. Wherever quarterly data on physical inventories are available, they should be the primary data source for quarterly estimates. The same is true of any quarterly balance sheet data.

Quarterly physical inventory data are probably available promptly for petroleum, and may be available for some major agricultural products. Quarterly balance sheet data are probably not available for most enterprises. It will therefore be necessary to use other data sources to interpolate. One possible source is discussed in this section: business tendency surveys that include a question on whether inventories are increasing, decreasing, or staying the same.

B. Methodology

Quarterly data on physical inventories and quarterly balance-sheet data can be treated in the same way as annual data from these two sources. Data from business tendency surveys on the direction of inventory change, however, require a separate, complex methodology. The

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following paragraphs outline this methodology.⁴ It should be noted that this data source has not been used, at least in major industrial economies. If there is interest in using it in Indonesia, a small pilot study applying the methodology below would be a useful first step.

Two basic assumptions about the properties of the survey data are necessary: the frequency distribution of actual percent changes underlying the plus-minus-no-change responses, and the meaning of "no change." For frequency distribution, a natural choice would be a normal distribution of percent changes. For the meaning of no change, a plausible assumption is that firms report changes between minus "x" and plus "x" percent of the stock as no change, with x equal to half a percent or one or two percent or some other fairly small value. For the typical value of "x", as well as for the frequency distribution of changes, it would be desirable to get empirically-based estimates at some point by surveying a small sample of firms.

Given the form of the distribution and the meaning of no change, it is possible to derive the mean change from information on the percentage of firms reporting increases, decreases, and no change. Suppose, for example, that in a particular quarter 35 percent of respondents report inventories increasing, 40 percent report no change, and 25 percent report inventories decreasing. Assume that responses are normally distributed and that no change represents any value between -1 percent and +1 percent of the initial stock. The use of cumulative normal distribution tables then leads to a distribution with a mean of 0.273 percent and a standard deviation of 1.885 percent (if no change represents values between -2 and +2 percent, the mean would be 0.545). The results indicate that the stock increased by .00273 times the initial stock (in constant prices). Table 3 presents this example.

⁴ This discussion is adapted from "National Accounts and Prompt Indicators: Progress and Future Priorities," STAT Project Report #19, February 2001, pp.11-12.

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Table 3
Using Business Tendency Survey Results to Estimate Inventory Investment:
Hypothetical Illustration

1. STOCK, END OF PREVIOUS QUARTER (constant prices) 10,000
2. RESULTS OF BUSINESS TENDENCY SURVEY:

Inventories decreasing	25 percent
No change	40 percent
Inventories increasing	35 percent
3. ASSUMPTIONS:
 - Normal distribution of percent changes
 - “No change” means -1 to +1 percent
4. CALCULATED NORMAL DISTRIBUTION WITH CUMULATIVE VALUE TO -1=.25
 CUMULATIVE VALUE TO +1 = .65
 - Mean = .273 percent
 - Standard deviation = 1.885
5. CALCULATED INVENTORY INVESTMENT DURING QUARTER:
 $.00273 * 10,000 = +27.3$

C. Next Steps

The first three steps listed under the heading of short-run indicators in Table 4 are determining the availability of three data sources on a quarterly or monthly basis: physical inventory data, balance sheet data, and business tendency surveys including a question on the direction of inventory change. If business tendency survey data are available, then it is possible to take the fourth step, a preliminary investigation or pilot study of the usefulness of the tendency survey data.

V. COVERAGE

This section takes up the twin problems of (1) possible overlapping coverage of existing sources, and (2) industries whose inventories are not covered by existing sources.

A. Overlapping Coverage

Overlapping coverage--that is, duplication of inventories measured by physical inventory data and by balance sheets--is probably a minor problem. Physical inventory data cover agricultural crops, petroleum, other minerals, and perhaps livestock. Balance sheet data from the annual survey of manufacturing cover only manufacturing industries, and data from the Surabaya stock exchange seem to cover largely manufacturing and finance. The main area of potential overlap would be minerals or agricultural products that are included in the physical product data

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and also in the materials component of the balance sheet data. Probably, however, the physical product data include only inventories owned by minerals producers or farmers, not inventories that have been sold to manufacturers and not yet processed. For the moment, it seems safe to ignore the overlap problem.

B. Undercoverage

The problem of undercoverage--inventories not measured by existing sources--is a serious one. Existing sources cover agriculture, minerals (including petroleum), and manufacturing. Some of the uncovered industries, such as finance or communications or service industries, account for only minor shares of the economy's total inventories. Very important exceptions, however, are the wholesale and retail trade industries, which have large inventory holdings and in most countries account for a significant portion of the short-run swings in inventory investment.

Another area of undercoverage is construction. Using definitions prior to the 1993 SNA, inventories held by construction establishments were not of great importance. But the 1993 SNA reclassified uncompleted construction projects--buildings, roads, bridges, etc., that have been started but are not yet in operation--as inventories. Adoption of the 1993 SNA will thus entail a large addition to construction inventories (formerly they had been classified as fixed capital).. The data sources discussed in this report will not cover these inventories of uncompleted construction projects; additional data on projects starts and completions will be necessary.

A comment on inventories held by households is appropriate at this point. Households do hold large stocks of inventories, especially inventories of food between the time crops are harvested and the time food is finally consumed. However, the official national accounts ignore these inventories. Households are considered to consume products at the time of purchase (or, in the case of food for farm households, at the time of harvest), not at the time of actual final use. This treatment is a matter of convenience; it would be difficult to obtain information on inventories held by households. The treatment occasionally raises problems in the interpretation of national accounts; but as long as Indonesia follows the official concepts, it need not undertake the measurement of household inventories.

At present, then, the main areas of undercoverage are retail and wholesale trade. Possibly some untapped source of balance sheet data will cover some firms in this sector. Even if they do, however, the represented firms will be large trading enterprises; and much of the trade sector's inventory holdings in Indonesia are probably in small, unincorporated enterprises.

C. Next Steps

A representative sample survey of retail establishments is the logical way to remedy this data gap. Experience in other countries, however, suggests that it is very difficult to design a

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survey that will accurately measure *levels* of inventories or sales for wholesale and retail trade, in which small establishments with wide geographic distribution play a major role. It may be better to design a survey of *ratios* of inventories to sales, and then apply these ratios to national accounts estimates of the appropriate categories of private consumption. The accuracy of such a survey will benefit from any tendency for cyclical swings in these ratios to be similar across many establishments.

Reported inventory-sales ratios will of course reflect the accounting rules that firms use to enter inventories on their balance sheets. If firms use FIFO accounting, valuing inventories at the time of acquisition, then inventory-sales ratios need to be multiplied by price relatives to convert them to inventory-sales ratios in current prices--the same adjustment described earlier for levels of inventories. Other accounting rules would require different adjustments.

The final next step listed in Table 4 is a pilot study of the availability of inventory-sales ratios for a small sample of wholesale and retail establishments. If the pilot study indicates that such a survey could yield prompt responses from an acceptable proportion of firms, then BPS can move ahead to developing a continuing survey.

VI. SUMMARY & PRIORITIES

A. Summary

The previous sections of this report have made it clear that measuring inventory change in Indonesia is a challenging task. It is a task, furthermore, that draws on a wide variety of data sources, some of them within BPS and others from outside sources. There are three principal sources of inventory data: (1) annual physical inventory data; (2) annual balance sheet data; and (3) short-run (quarterly) indicators of inventory change. These must be supplemented by other information--on prices, on accounting practices, etc. For each source, there is a series of "next steps" needed to develop national accounts estimates. Table 4 brings together the next steps recommended in each section of the report.

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Table 4: Next Steps

<i>Next step</i>	<i>Comment</i>
A. Physical Inventory Data	
1. Collect annual data for 1995-2000 (Use Table 1 as a starting point)	End of year inventories and annual average unit values for petroleum, minerals, crops, livestock, etc.
2. Gather information on release schedule of annual data, and create a table of expected release dates by commodity	Note availability of preliminary estimates and forecasts as well as final estimates. Note timing of revisions.
3. Design and fill worksheets for calculating inventory change in current and constant prices.	See Table 1.
B. Balance Sheet Inventory Data	
1. Collect and review Annual Survey of Manufacturing Data for 1995-2000	Review estimates for nonreporting establishments and discrepancies between closing inventories and next-year opening inventories. Make recommendations for improvement.
2. Collect and review stock exchange data	Approach the Jakarta as well as the Surabaya exchange. Find out about promptness of balance sheet reports.
3. Investigate other sources of balance sheet data.	Possibly some ministries or regulatory bodies collect balance sheet data.
4. Find out about accounting rules	Initially, interview a few enterprises and accounting firms about general practice with respect to entering balance sheet values of inventories. Eventually, design a small sample survey of firms' accounting practices.
5. Find out about age distribution	Follow the same two-step procedure as recommended for step 4.
6. Select price deflators for each 2-digit industry.	Choose deflators from either the wholesale price index or unit value indexes for manufacturing industries.
7. Calculate weights for the deflators within each industry.	Weights should ideally reflect the relative importance of different products in total inventories; in practice, weights will have to be based mainly on proportions of total production and purchases, based on input-output tables.
8. Plan for initial, experimental calculations of inventory change based on balance sheet data.	Initial calculations will be only crude approximations, but will be useful to compare with the present residual estimates of inventory change.
C. Short-run indicators	
1. Investigate the availability of quarterly physical inventory data.	
2. Investigate the availability of quarterly balance sheet data.	
3. Investigate the availability of quarterly tendency survey data on the direction of inventory change	
4. If tendency survey data are available, conduct a small pilot study to see if they give plausible results.	Results over 4 quarters should be compared with annual data from other sources.
D. Coverage	
1. Conduct a pilot study of the availability of inventory-sales ratios for wholesale and retail establishments.	

Inventories in physical units such as tons or barrels or kilograms are available annually for petroleum products, other minerals, major crops, and perhaps livestock. The methodology of converting these data to national accounts concepts is straightforward; the only additional information needed is average unit values in rupiahs corresponding to each physical unit. The

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next steps in making use of this data source, listed in Table 4, are collecting all available data, noting schedules of data availability and revisions, and designing worksheets for conversion to national accounts concepts.

Balance sheet information on inventories seem to be available annually mainly for manufacturing enterprises, although further investigation of possible data sources might uncover information about other sectors with important inventory holdings. The methodology of converting balance sheet data to national accounts concepts is complex. It requires not only information about prices, but also about accounting practices and the age distribution of inventories. There are, as Table 4 shows, many next steps needed to make use of this data source. They include tabulation and careful investigation of existing data sources; a search for additional sources of balance sheet data; collection of information about accounting practices and age distribution; selection of price indexes or unit values corresponding to inventory categories; and experimental calculations of inventory change following national accounts concepts.

Short-run indicators of inventory change include any available quarterly physical inventory data, any available quarterly balance sheet data, and questions about the direction of change of inventories in business tendency surveys. For physical inventory and balance sheet data, the methodology is the same for quarterly as for the annual data; the next steps in utilizing such information are simply to determine whether the information exists, and if it does, how promptly it becomes available. For business tendency data the methodology is complex, requiring information or assumptions about the form of the frequency distribution of percent changes and about the definition of "no change." Next steps here include determining the availability of tendency survey data (and, where possible, strongly encouraging the inclusion of questions on the direction of inventory change), and conducting a pilot study of converting such information to estimates of quarterly inventory change.

Even if these data sources are fully utilized, undercoverage remains a problem, principally because the wholesale and retail trade sectors are not represented by either physical inventory data or balance sheet data (at least in sources investigated to date). The report suggests that a survey of the inventory-sales ratios of wholesalers and retailers might be the best way to gain information about this sector; accordingly, the next step to remedy undercoverage is a pilot study of the availability of such information from a sample of trading enterprises.

B. Priorities

Making plans for taking the "next steps" listed in Table 4 is itself a difficult step. These plans need to be made within BPS, because they must take into account budget and personnel resources and all the other obligations that BPS needs to fulfill. To conclude this report, however, it may be helpful to suggest some *groups* of steps that (a) logically belong together and (b) in some cases, will themselves produce useful indicators.

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An initial group of steps that meet these criteria consists of the three steps under "Physical Inventory Data" in Table 4; collection of physical inventory data, establishing a schedule for expected revisions and updates, and preparing worksheets. These steps could be accomplished in one or two months and could, if enough data are available, produce an aggregate indicator of *inventory change of primary products*--minerals, crops, and perhaps livestock. The aggregate could be subdivided into petroleum, rice, and all other. At the same time as these steps were taken, it would be convenient to take the first step under "Short-Run Indicators" in Table 4, investigating the availability of quarterly physical inventory data.

A possible second group of steps consists of the first five steps under "Balance Sheet Inventory Data" in Table 4; collecting and reviewing Annual Survey of Manufacturing data, stock exchange data, other possible sources of balance sheet data, and investigating accounting rules and lag distributions. At the same time, it would be convenient to take the second step under "Short-Run Indicators," investigating the availability of quarterly balance sheet data. This would be a very time-consuming group of steps--it could easily take a year--and it would not produce an immediately useful result. But this group would prepare the ground for converting balance sheet data to national accounts concepts, and is therefore a necessary preliminary to useful estimates of inventory change derived from balance sheet data.

The next logical group of steps consists of steps 6 and 7 under "Balance Sheet Inventory Data" in Table 4; selecting price deflators and making initial calculations of inventory change. This group would incorporate the results of the second group of steps, but would nevertheless require additional time, because the selection of deflators and appropriate weights is a complex task. At the end, it would produce an aggregate measure of *inventory change in manufacturing* and perhaps in some other sectors as well.

As this third group of steps is proceeding, it would be helpful to begin work on the pilot study recommended in Table 4 under "Coverage". Once BPS has some indication of inventory change for primary products and for manufacturing, the main missing sector will be trade. The pilot study would provide guidance about how to proceed in estimating inventory change for trade, though additional steps would be required to produce actual estimates.

A final group of steps that belong together are the ones listed under "Short-run Indicators" in Table 4; three having to do with data availability, and the fourth consisting of a pilot study of the use of tendency survey data on the direction of change in inventories. The first two of these steps were recommended for inclusion in the work on annual physical inventory data and annual balance sheet data. If the third step, availability of tendency survey data, yields positive results, then it should not be too time-consuming to complete this group of steps. Again, however, additional steps would be required to produce actual quarterly estimates.

This discussion of priorities makes it clear once more that the development of direct estimates of inventory change is a time-consuming and difficult process. Fortunately, some

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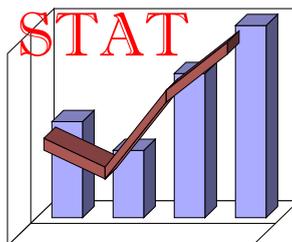
useful indicators--measures of inventory change for primary products and for manufacturing--should emerge long before the end of the process. But even apart from these indicators, it is worth pursuing the process to the end because direct investment of overall inventory change can substantially improve the expenditure side of the national accounts.

AN EXPANDED INDUSTRIAL PRODUCTION INDEX FOR INDONESIA

Report # 47
Statistical Paper # 12

by
Frank de Leeuw

February, 2002



Statistical Assistance to the Government of Indonesia (STAT) Project
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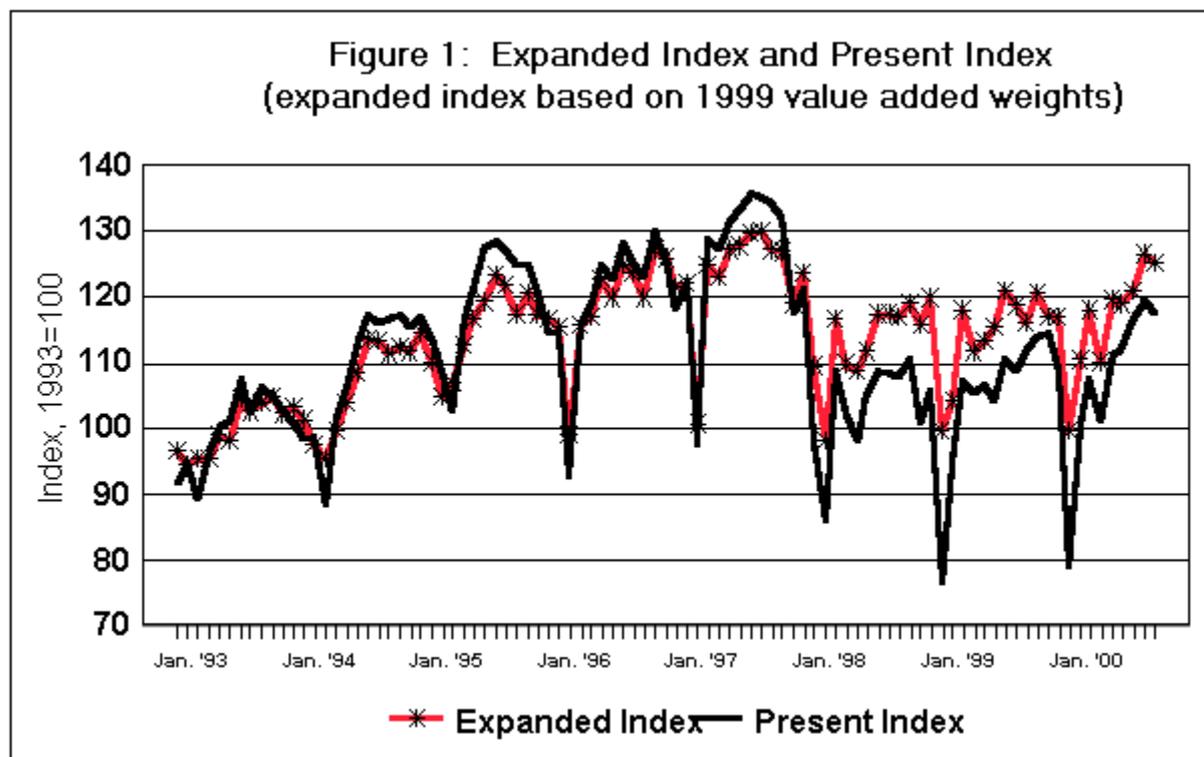
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An Expanded Industrial Production Index for Indonesia

I. INTRODUCTION¹

This report introduces an expanded index of industrial production for Indonesia. The present Indonesian industrial production index covers non-oil medium- and large-scale manufacturing. The expanded index includes oil, gas, other minerals, and electricity as well as non-oil manufacturing. Non-oil manufacturing in 1999 accounted for 54 to 70 percent of the expanded index, depending on the weighting scheme used. Figure 1 compares the present index and one version of the expanded index.



The biggest advantage of the expanded index is that it is a more complete indicator of non-farm goods activity than the present index. Furthermore, the coverage of the expanded index is the same as that of industrial production indexes in many other countries, so that international comparisons are more valid using the expanded index. On the disadvantage side, the expanded index may at times reflect special, transient factors in world markets for petroleum and minerals, and therefore be a poorer indicator of the business climate in Indonesia than the present index. But even if some version of the expanded index is adopted and published regularly, there would be no need to give up the present index. The present index, which would be the largest

¹ Sri Andayani of the Industry Directorate of BPS supplied most of the data used in this report and patiently answered numerous questions about data sources and characteristics.

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component of the expanded index, would continue to be published separately. Users could emphasize the present index whenever they felt that it was appropriate to do so.

Following this introduction is a section on *coverage*, presenting the available data for the four groups of activities to be added to non-oil manufacturing--oil and gas extraction, other minerals, petroleum refining, and electricity. Then comes a section presenting four sets of *weights* for the expanded index, based on values in two years (1993 and 1999) and two concepts (value of production and value added). The next section summarizes the *results* for the period January 1993 to December 2000, and includes a comparison with the non-agricultural goods sector of the national accounts. The final section offers some *recommendations*. Individual data series are shown in an appendix.

II. COVERAGE OF THE EXPANDED INDEX

The expanded index is a weighted average of the present non-oil manufacturing index and 14 additional indexes. For description and presentation, it is helpful to classify the additional indexes into four groups: oil and gas extraction (4 indexes), non-oil minerals (8 indexes), petroleum refining (one index) and electricity (one index). Table 1 summarizes the data sources for these groups. The paragraphs below supply some additional details.

Table 1
Indexes and Data Sources

Description	Oil and Gas (crude oil, natural gas, LPG, geothermal)	Non-Oil Minerals (tin, nickel, bauxite, iron sand, coal, copper, gold, silver)	Petroleum Refining	Electricity
Number of indexes	4	8	1	1
Data Sources				
Production (physical units, monthly)	Department of Energy	Department of Energy	Department of Energy	PLN electricity sales (total since '96, industrial linked to total before '96)
Value of Production (1993 and 1999)	BPS yearbooks, production times value per unit of domestic sales	BPS yearbooks, value of production for each product	BPS yearbooks	PLN value of production (BPS report)
Value Added (1993 and 1999)	BPS yearbooks, ratio of value added to value of production applied to value of production	BPS yearbooks, ratio of value added to value of production applied to value of production	BPS yearbooks	PLN value added (BPS report)

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A. Non-Oil Manufacturing

The present non-oil manufacturing index, based on monthly, quarterly and annual establishment surveys by BPS, has been described in detail in other reports.² It covers medium-sized and large establishments, and it employs a Divisia formula in which weights are recalculated every month. These two features are retained in the expanded index.

The expanded index, accordingly, does not include small manufacturing establishments and incorporates the Divisia formula within manufacturing. Outside of manufacturing (and for combining manufacturing with the other sectors) the expanded index does not employ the Divisia formula, which requires detailed monthly value information in addition to monthly production. The section on weights describes the alternative weighting schemes used in the expanded index in detail.

B. Oil and Gas Extraction

The four series in this group are crude oil, natural gas, Liquefied Petroleum Gas (LPG), and geothermal. Crude oil is by far the most important. Natural gas is next, and the other two account for much less than 1 percent of the group weight.

Monthly production totals for these products are compiled by the Department of Energy, which then transmits them to BPS. The promptness of this monthly information (and also information on non-oil minerals and petroleum refining) is thus in the hands of the Department of Energy.

Annual information on total value and unit value, used to derive weights for these series, come from the annual reports *Mining Statistics of Petroleum and Natural Gas*, compiled and published by BPS. The latest report is for 1999.

C. Non-Oil Minerals

The eight series in this group are tin, nickel, bauxite, iron sand, coal, copper, gold, and silver. In 1993 copper and coal were the most important, together accounting for nearly two thirds of the total value of this group. Since then copper production has increased rapidly, so that copper alone accounted for nearly two-thirds of the total value of the group in 1999.

The sources of monthly and annual data for this group are the same as for oil and gas extraction--Department of Energy for the monthly data and BPS yearbooks for the annual value data. The latest BPS annual report is *Mining Statistics of Non Petroleum and Natural Gas* for 1999.

² The latest report is Yahya Jammal and Vijay Verma, *Monthly Manufacturing Production and Employment Indices*, STAT Project, Report #30, April 2001.

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D. Petroleum Refining

Monthly data on petroleum refining is once again supplied by the Department of Energy. The much less important gas refining is omitted. The specific time series used to represent refinery production is output of fuels, in barrels. Output of non-fuels (products such as asphalt) is not represented, partly because it is much less important and partly because a single quantity series for these products might mask significant changes in composition.

Annual data for petroleum refineries comes from the same source as for oil and gas extraction; namely BPS' annual reports *Mining Statistics of Petroleum and Natural Gas*.

E. Electricity

The monthly series used to represent electricity production is electricity sales by the public electricity company PLN. Weights for this sector also refer to PLN. Non-PLN production is reflected to the extent that it is bought and re-sold by PLN. But non-PLN production not bought by PLN--principally electricity generated for own use by manufacturing establishments--is omitted. Production by the utilities sector other than electricity is also incomplete; gas production is included as part of oil and gas extraction, but water production is omitted. These omissions of own-use electricity and water, probably the most important gaps in coverage of the expanded index, are due to absence of monthly data. Before 1996, furthermore, even total PLN monthly sales are not available, and have been estimated in this report by linking a series on sales to industry to the total in January 1996.

Annually, value of production and value added for electricity are reported in the BPS annual report *PLN Electricity Statistics*. The 1999 value added is unusually low, only 13 percent of the value of output, compared with a range of 25 to 59 percent in the preceding four years. These widely fluctuating ratios probably merit a review for presence of any special factors that might not be appropriate to incorporate into a weighting scheme.

III. WEIGHTS

Weights for combining production indexes should reflect the relative values of goods in an economy. Generally speaking, a good that accounts for a lot of value in one year will also do so in the next year; and an industry that accounts for a large proportion of value of production will also account for a large proportion of value added. But since there are exceptions, it is useful to compare results under several weighting schemes.

The expanded production index in this report has been calculated using four weighting schemes, representing two years and two concepts of value. The two years are 1993, the year that is the present weighting year for the national accounts, and 1999, the latest year for which value data are available for all the components of the index. The two value concepts are *value of*

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production and value added. Thus, indexes have been calculated based on 1993 value of production, 1993 value added, 1999 value of production and 1999 value added. The section on results will show that the four expanded indexes based on these four schemes all show remarkably similar behavior. Consequently, it does not seem worth experimenting with other alternatives such as chain weights, Fisher or Tomqvist formulas, and other complexities.

Table 2 shows weights for the major components of the expanded index under the four schemes tested. Notes and comments on each of the four follow.

Table 2
Weight Data

(Value figures in billion rupiahs)	Non-oil manufacturing	Oil and Gas Extraction	Non-oil minerals	Petroleum refining	Electricity
<i>Value</i>					
Value of production, 1993	135864	28329	6542	13451	5841
Value added, 1993	49821	25678	4283	6506	2604
Value of production, 1999	498144	91920	57400	37926	17676
Value added, 1999	177399	84285	46688	20186	2299
Value of prod., 1993 in 1999 prices	462931	93481	21837	30337	9601
Value added, 1993 in 1999 prices	168236	85717	17761	16147	1249
<i>Proportions of Total</i>					
Value of production, 1993	<i>.715</i>	<i>.149</i>	<i>.034</i>	<i>.071</i>	<i>.031</i>
Value added, 1993	<i>.560</i>	<i>.289</i>	<i>.048</i>	<i>.073</i>	<i>.030</i>
Value of production, 1999	<i>.704</i>	<i>.133</i>	<i>.083</i>	<i>.055</i>	<i>.026</i>
Value added, 1999	<i>.536</i>	<i>.255</i>	<i>.141</i>	<i>.061</i>	<i>.007</i>
Value of prod., 1993 in 1999 prices	<i>.749</i>	<i>.151</i>	<i>.035</i>	<i>.049</i>	<i>.016</i>
Value added, 1993 in 1999 prices	<i>.582</i>	<i>.296</i>	<i>.061</i>	<i>.056</i>	<i>.004</i>

A. Based on Value of Production in 1993

Value of production is the value concept normally used to combine production indexes, and 1993 is the weighting year currently used for Indonesia's national accounts and price indexes. Consequently, a weighting scheme based on value of production in 1993 is one obvious choice for the expanded production index. Whether it is the best choice is a separate issue, to be discussed below.

Procedures for implementing this scheme varied from group to group. For manufacturing, there was no re-weighting of individual components. The entire manufacturing index (with its Divisia weights) was treated as a single series, its weight based on the total value of production in manufacturing. For oil and gas, separate weights for each of the four items were calculated based on the value of production in 1993 and value per unit of domestic sales in 1993. For non-oil minerals weights for individual items were based on total value of production published in

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BPS yearbooks (except that for gold and silver, only a total value of production for the two was available, and was split based on price and production data). Finally, petroleum refining and electricity were each represented by a single series weighted by the total value of production.

As Table 2 shows, manufacturing receives a high weight under this scheme--71.5 percent of the total. The next most important group, oil and gas extraction, has a weight of only 14.9 percent.

B. Based on Value Added in 1993

A drawback of using weights based on value of production is double counting. The value of coal, oil, or electricity that is used by manufacturing establishments is reflected once in the value of production for these products and once in the value of production for manufacturing. An alternative procedure is to use weights based on value added, which equals the value of production minus the value of intermediate goods used. With value added weights, the value of energy products used in manufacturing, for example, will be reflected only in their own weights, not in the weight for manufacturing. The US monthly index of industrial production uses value added weights; perhaps other countries do so as well.

Conceptually, a so-called "double deflated" index for each product in which the quantity of output has a positive weight based on value of production and quantities of inputs (energy and other materials and services) have negative weights based on value of intermediate goods has important advantages. Such indexes, summed over all industries, will add to GDP; and they are appropriate for measuring productivity. Computation of such indexes on a monthly basis is not feasible, however; they require far more data than is available in Indonesia and in almost every other country.

The feasible alternative to weights based on value of production, at least for a monthly index, is weights based on value added. In the calculations, a single ratio of value added to value of production was used for the four oil and gas extraction series, and a single ratio was used for each of the eight non-oil minerals.

Proportions of total based on value added tend to be smaller than proportions based on value of production for industries that rely heavily on raw materials, such as many manufacturing industries. Conversely, proportions based on value added tend to be higher for primary industries, such as oil or many mining products. Table 2 shows these effects; the manufacturing proportion falls from .715 based on value of production in 1993 to .560 based on value added in 1993. The proportion for oil and gas extraction rises from .149 to .289.

C. Based on Value of Production in 1999

A weighting scheme should reflect the relative prices actually confronting enterprises and purchasers when they make their economic decisions. For recent years, then, 1999 should be a

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better weighting year than 1993. Table 2 shows value of production and proportions for 1999. The principal difference between these 1999 proportions and the 1993 proportions is that the proportion for non-oil minerals is much higher in 1999--.083 as compared to .034 in 1993.

These 1999 proportions, however, are not suitable for combining indexes in which 1993 equals 100. Either the indexes need to be re-based to 1999, or the proportions need to be adjusted so that they value production in 1993 *at 1999 prices*. The table shows the results of the latter approach, which is accomplished by dividing 1999 values by production indexes for 1999 and then calculating proportions of these amounts. These adjusted proportions are shown in the next to last set line of Table 2. The proportion for non-oil minerals is no longer high, because the production index used to divide into the 1999 value is very high. The proportions for manufacturing and for oil and gas, in contrast, are higher after dividing by their 1999 indexes.

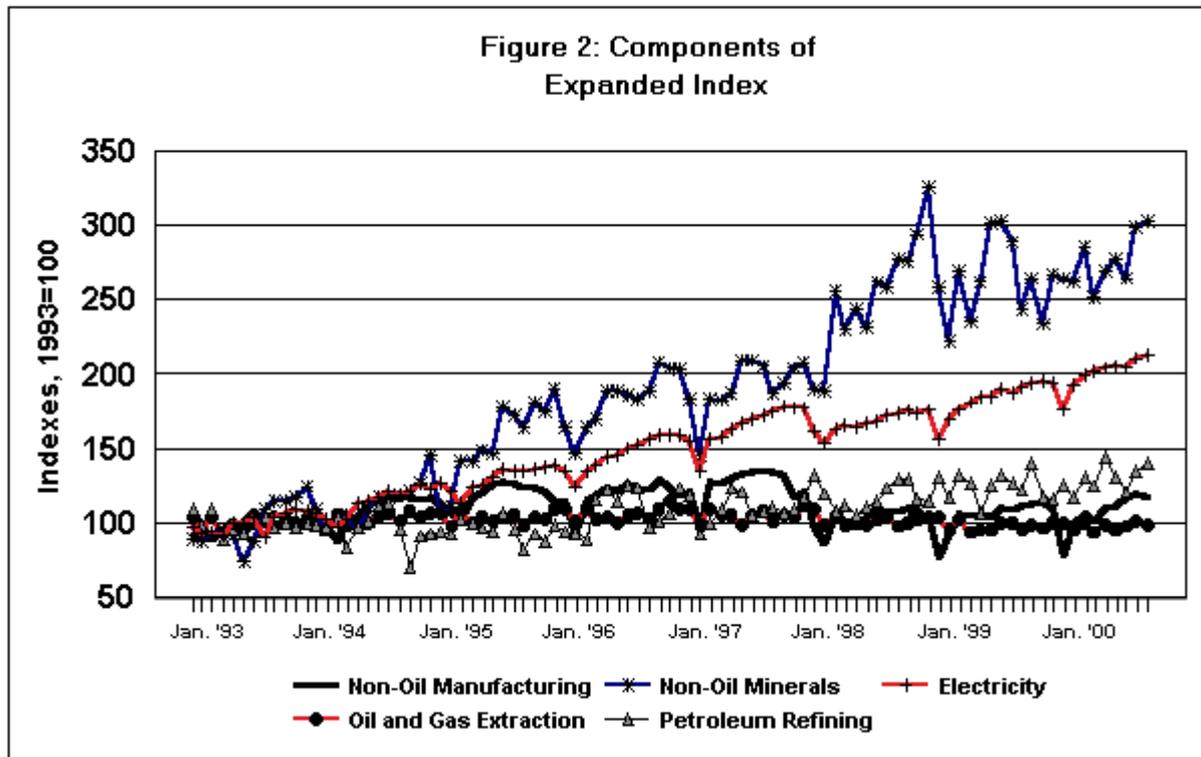
D. Based on Value Added in 1999

The final weighting scheme used for calculating the expanded index is based on value added in 1999. This scheme has the two advantages of being based on a recent year and of avoiding double counting. As explained in the preceding section, value added proportions in 1999 need to be adjusted before being used to combine indexes on a 1993 base. The final row of Table 2 shows these adjusted value-added proportions. They are for the most part quite similar to proportions based on value added in 1993. One exception is the proportion for electricity, which falls from .030 (based on 1993 value added) to only .004 (based on adjusted 1999 value added). As noted in the section on coverage, the 1999 ratio of value added to value of production for PLN, on which this weight is based, was exceptionally low, perhaps due to some special circumstances which would make it unrepresentative of other recent years.

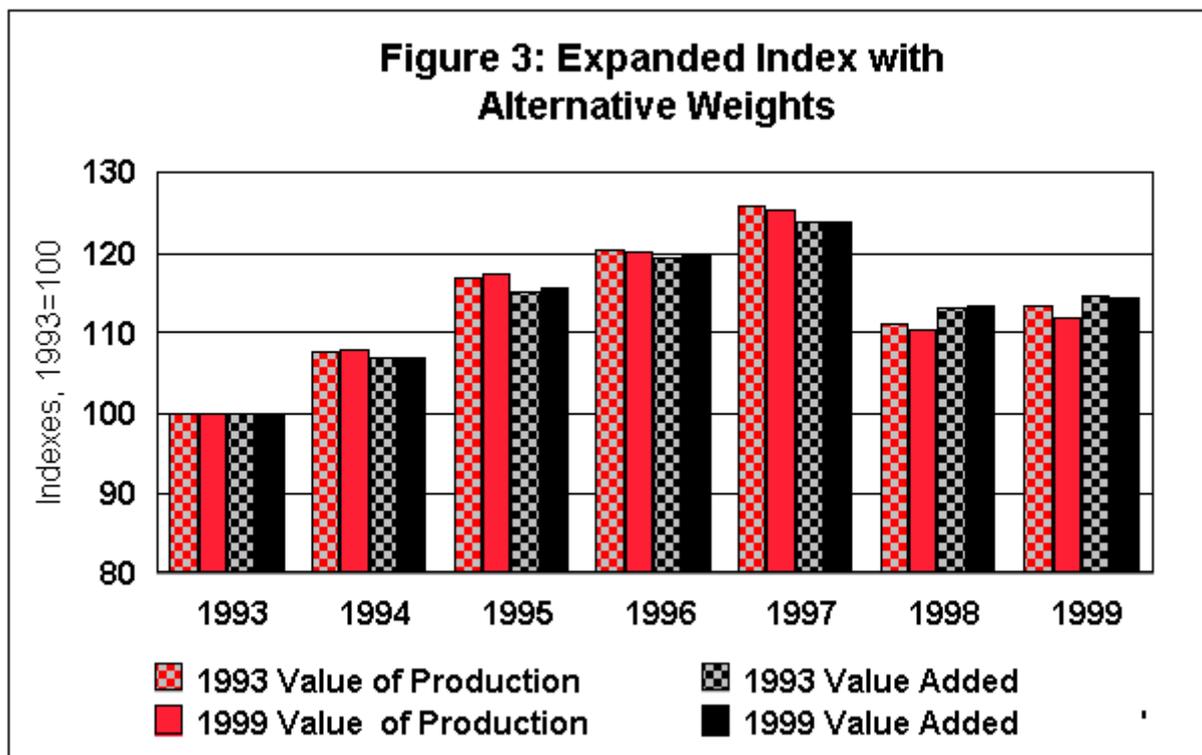
IV. RESULTS

Figure 1 at the beginning of this report compares the present non-oil manufacturing index with the expanded index based on 1999 value-added weights. Since the present index accounts for more than half the weight of the expanded index, it is not surprising that the two display broadly similar movements. There are, however, some persistent differences. The expanded index tends to fluctuate less than the present index; it rises less rapidly in 1993-95 and drops much less rapidly in 1997-98. Over the entire period, the expanded index shows more growth than the present index. Average annual growth rates from the year 1993 through the third quarter of 2000 are 2.9 percent for the expanded index and 2.2 percent for the present index.

Figure 2, showing major components of the expanded index, makes clear the reasons for these differences. The smaller fluctuation in the expanded index is due to the relatively narrow fluctuation in oil and gas extraction. The higher overall growth rate is due to the extremely rapid

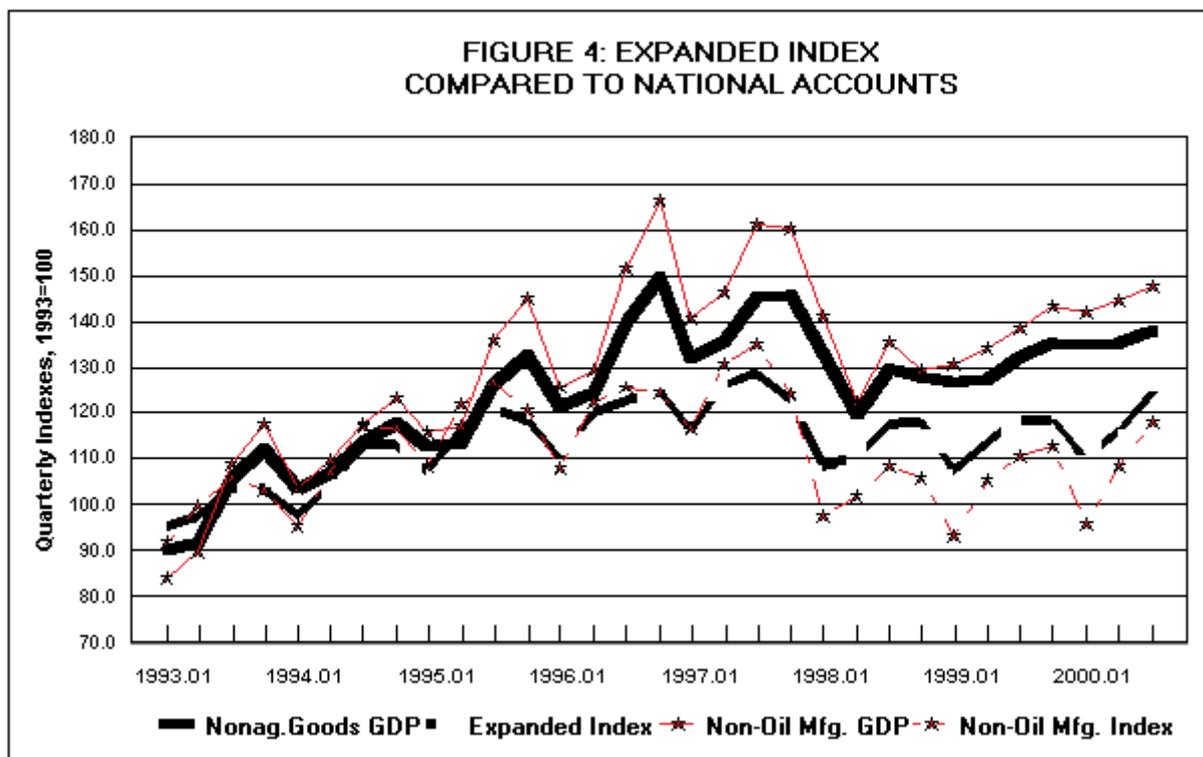


growth of non-oil minerals. From 1993 through the third quarter of 2000, this group grows at an average annual rate of 15.2 percent, far more than the 2.2 percent for non-oil manufacturing and the 0.0 percent for oil and gas extraction.



The foregoing results are all based on the version of the expanded index that uses 1999 value added weights. As Figure 3 shows, however, it makes very little difference which of the four versions of the expanded index is used. The Figure presents annual averages because lines showing monthly indexes would overlap so closely as to be impossible to follow. In 1999, the two 1993-weighted indexes are very slightly above the two 1999-weighted indexes, and the two value-added-weighted indexes are slightly above the two value-of-production-weighted indexes. But the differences are very small; the four indexes are 113.6, 112.1, 114.7, and 114.4.

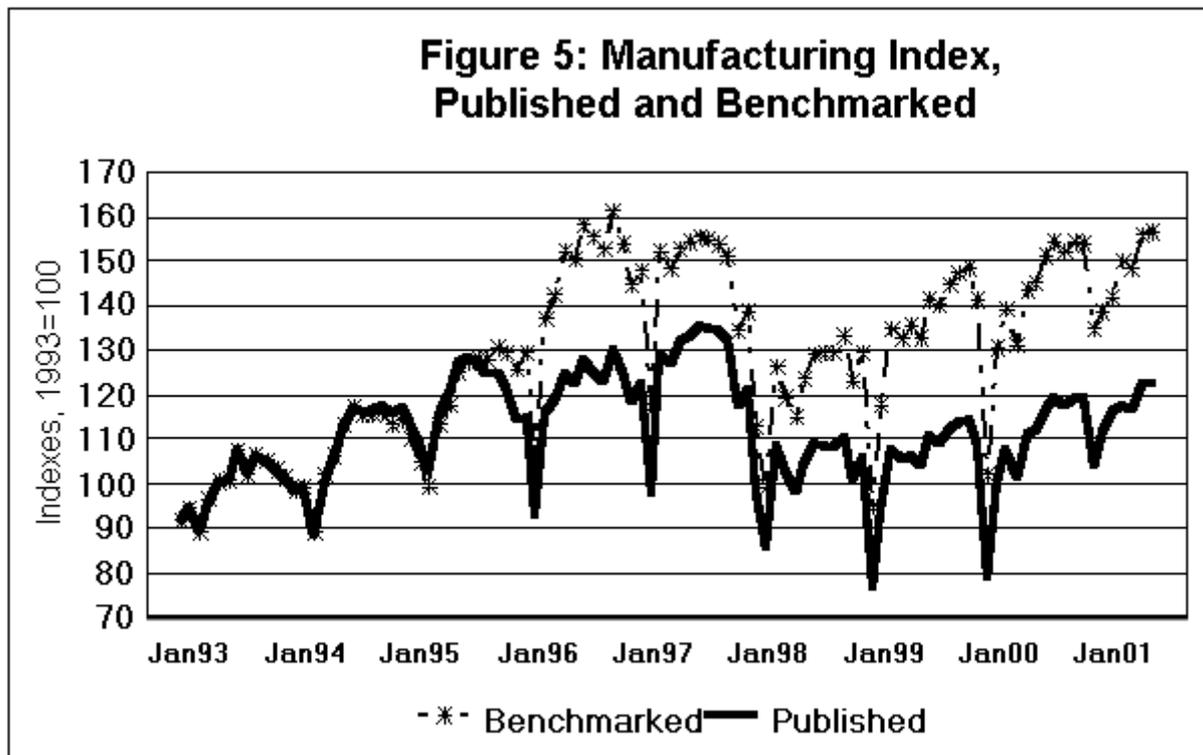
More substantial differences emerge between the expanded index and the nonagricultural goods components (mining, manufacturing, and utilities) of GDP in constant prices. The comparison is shown in Figure 4. In 1995 and 1996, an index of GDP for non-agricultural goods (the thick solid line in the Figure) rises above the expanded index (the thick dashed line in the Figure) and stays above for the rest through the last quarter of 2000. Examination of major components reveals the surprising result that this difference is entirely due to non-oil manufacturing. The Figure shows non-oil manufacturing constant-price GDP (the thin starred line) and the present non-oil manufacturing index (the dashed starred line), the latter being the major component of the expanded index. Like the two more comprehensive indexes, these two diverge in 1995 and 1996 and never draw closer together. Furthermore, there are some large seasonal differences between these two in the first quarters of 1999 and 2000.



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Some evidence suggests that with respect to general levels, the national accounts are more accurate. The evidence comes from the annual surveys of manufacturing establishments. The published manufacturing index is not adjusted to these annual benchmarks; but BPS has recently constructed a benchmarked series (to be published in the near future). Figure 5 compares these two series. Like the two in Figure 4, they draw apart in 1995 and 1996 and stay apart.



V. RECOMMENDATIONS

The main recommendation of this report is that BPS begin compiling an expanded monthly production index that includes not only non-oil manufacturing but also oil and gas extraction, other mining activity, petroleum refining, and electricity production. The present index of non-oil manufacturing production will (at least in the foreseeable future) be the principal component of the expanded index, and will of course be shown separately.

Adoption of this recommendation, however, does not mean that publication would begin immediately. The new index would be circulated within BPS initially; but there are a number of difficulties that should be investigated and preferably resolved before general distribution and publication.

The most severe difficulty is lack of promptness. At present (February, 2002) the eight non-oil mineral series are available only through October 2001, with some series estimated beginning in June or July of that year; and the four monthly series on oil and gas exploration are

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available only through May 2001, with crude oil estimated through October. A production index that is available only after a lag of four months is of little use in indicating current business trends. The reason for the lags need to be investigated; perhaps the Department of Energy, which collects the monthly figures, has only limited interest in making them available on a current basis. Somehow it will be necessary to make arrangements for more prompt compilation. Wherever possible, furthermore, the quality of the production data—especially of any preliminary estimates—should be monitored as well as its promptness.

Another category of difficulty is statistical puzzles. The most important of these is the discrepancy between changes in non-oil manufacturing GDP (in constant prices) as measured in the national accounts and changes in the present index of non-oil manufacturing (see Figure 4). Annual surveys of manufacturing, not incorporated in the published monthly index, suggest that the published index is understated (see Figure 5); but they do not shed any light on the quarterly discrepancies in 1999 and 2000. Another puzzle is the surprisingly small ratio of value added to value of production in 1999 for PLN, resulting in a minuscule weight for electricity based on 1999 value added (see Table 2). These puzzles should be investigated. They may lead to some changes in methodology, such as benchmarking the present production index, before finalizing the expanded index.

A less important difficulty is the omission of certain industrial activities from the expanded index presented in this report. Probably the biggest of these is electricity generated for own use by manufacturing (and perhaps other) establishments. If monthly information is available for own-use electricity, it should be incorporated. Other omissions that are probably more difficult to remedy (and should not stand in the way of publication of an expanded index) are the monthly output of small manufacturing establishments and the monthly supply of clean water.

Finally, there is the matter of weights. Since different weighting schemes seem to yield similar results (see Figure 3), this is not a matter of great substantive importance. It does, however, need to be resolved before publication. With respect to the value concept, value added seems preferable to value of production, because of the double-counting problem. With respect to the weighting year, 1999 seems preferable to 1993. Weights based on 2000, when they become available, would be still better both because 2000 is a more recent year and because it is farther removed from the short-run impacts of the 1998 crisis. However, these are not the only possible choices. It would be desirable to have the expanded index conform as closely as possible to whatever weighting year (or series of weighting years) is planned for the national accounts and price indexes.

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APPENDIX

DATA SERIES

A. OIL AND GAS EXTRACTION

1. Production in physical units

	Crude Oil and Condensate (Barrel)	Natural Gas (MSCF)	ING (MMBU)	LPG (MI)	Geo- thermal (ton)
1993	547,430,213	2,663,856,316	1,268,772,086	2826,880	9,717,608
Jan.	47,888,209	231,217,814	113,504,125	258,669	888,374
Feb.	43,339,154	208,020,509	101,357,616	219,603	792,067
Mar.	47,700,932	231,322,311	111,920,128	246,443	873,635
Apr.	44,223,122	194,814,104	85,740,693	236,493	809,615
May	45,894,326	210,799,581	95,810,870	227,501	887,095
June	44,588,342	214,717,792	101,601,584	230,375	610,533
July	46,308,634	222,953,635	108,183,922	249,146	883,372
August	46,289,415	224,167,090	105,112,856	185,833	780,754
Sept.	44,760,745	216,211,470	99,378,858	260,613	795,693
Oct.	46,640,574	233,192,714	110,677,212	245,203	866,131
Nov.	44,123,473	229,991,112	112,031,444	217,376	674,264
Dec.	45,673,287	246,448,184	123,452,778	249,625	856,075
1994	551,147,167	2,944,978,077	1,377,371,175	3,926,435	9,358,494
Jan.	47,108,627	247,087,776	127,618,392	254,807	864,905
Feb.	42,511,319	226,392,469	114,376,323	234,020	816,450
Mar.	46,938,240	251,247,239	123,084,758	259,973	957,241
Apr.	44,875,192	215,540,969	93,377,037	226,805	816,047
May	46,170,792	227,396,015	96,776,927	469,991	833,070
June	45,031,300	238,466,831	102,138,550	239,130	795,358
July	47,188,282	250,484,259	113,573,048	238,226	580,134
August	46,714,508	261,376,622	121,743,385	761,004	841,769
Sept.	45,091,689	245,888,872	111,575,793	543,245	777,549
Oct.	47,469,795	260,266,801	118,557,404	226,163	797,143
Nov.	45,337,462	260,452,354	124,948,899	234,680	710,696
Dec.	46,709,961	260,377,870	129,600,659	238,391	568,132
1995	546,976,193	3,005,358,399	1,282,878,230	3,936,035	17,558,900
Jan.	46,463,688	259,981,965	113,573,048	238,226	1,714,846
Feb.	42,372,734	244,992,560	121,743,385	761,004	1,550,196
Mar.	46,853,296	268,422,607	111,575,793	543,245	1,686,757
Apr.	44,632,630	236,294,375	101,591,459	221,441	1,622,614
May	46,172,989	251,439,051	105,808,247	245,597	1,598,067
June	44,663,256	244,756,441	103,637,298	243,217	1,302,950
July	46,334,100	246,630,900	99,546,000	250,689	1,233,406
August	46,648,900	254,749,100	108,744,000	332,512	1,567,304
Sept.	44,761,000	228,903,100	93,441,000	241,873	1,320,658
Oct.	46,172,500	245,213,100	97,769,000	256,073	1,474,188
Nov.	45,000,800	250,123,500	105,411,000	315,651	1,295,331
Dec.	46,900,300	273,851,700	120,038,000	286,507	1,192,583
1996	553,923,146	3,166,620,604	1,357,425,987	3,273,700	18,684,313
Jan.	47,126,450	278,524,868	126,686,724	301,313	1,613,619
Feb.	43,861,942	259,589,014	120,279,472	341,271	1,427,507
Mar.	46,826,904	274,530,363	124,212,876	285,885	1,939,338
Apr.	44,922,470	250,170,635	106,047,364	269,624	1,525,611
May	46,039,070	248,523,433	98,709,741	257,220	1,490,849
June	44,477,290	238,480,871	92,965,970	252,828	1,476,525
July	46,333,170	256,075,543	105,699,921	275,801	1,488,023

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August	46441,270	267292,489	114923,744	284491	1,622,542
Sept	44386,940	255963,455	106439,512	240583	1,406,874
Oct	46472,130	280988,490	112080,363	258685	1,682,777
Nov.	50316,250	273244,635	122464,495	247038	1,344,007
Dec.	46719,260	283236,808	126915,805	258961	1,666,641
1997	544741,320	3,166,034,892	1,402,621,549	2,786,652	22,487,274
Jan.	46626,160	276438,552	127861,524	267,141	1,539,650
Feb.	41992,760	253504,992	114974,034	223016	1,355,091
Mar.	46555,890	278306,129	125345,333	226821	1,587,781
Apr.	44864,550	268242,086	117622,945	224238	1,489,921
May	45973,960	263570,073	112806,875	206665	1,722,456
June	43981,060	238530,705	93231,789	207834	1,681,263
July	45943,210	263282,600	110728,729	238364	1,789,882
August	46148,460	273099,873	121668,094	213619	2,035,745
Sept	44384,620	250000,600	107079,217	224118	1,891,419
Oct	45643,080	257919,656	113407,760	215471	2,229,277
Nov.	44769,550	263111,914	122672,793	260507	2,412,961
Dec.	47858,020	280027,712	135222,456	278858	2,751,828
1998	537500,168	2979,459,565	1,384,699,847	2,324,274	30,187,120
Jan.	47569,306	267784,723	128254,468	235602	2,591,506
Feb.	43077,034	239332,710	124355,074	191064	2,135,646
Mar.	45786,272	250492,179	114111,361	195718	2,393,505
Apr.	44089,560	230830,123	98828,047	194595	2,106,835
May	45456,819	236124,412	96954,395	175322	2,217,386
June	44120,520	229838,179	94425,253	164896	2,556,205
July	45024,848	252718,324	121640,907	176649	2,775,227
August	44542,773	262068,996	128640,992	221040	2,682,869
Sept	42470,507	241951,861	118680,200	191873	2,535,197
Oct	43829,992	241919,728	115176,578	184414	2,734,199
Nov.	47035,642	257449,926	128455,994	200583	2,654,285
Dec.	44496,895	268948,404	115176,578	192518	2,804,260
1999	495524,803	3,067,820,739	1,540,783,773	2,258,213	30,807,564
Jan.	44320,442	266805,983	137505,860	217646	2,855,406
Feb.	40042,485	248443,380	124312,100	186453	2,568,657
Mar.	44086,097	260774,458	128317,420	213677	2,723,927
Apr.	40430,752	238938,378	111500,404	194780	2,360,192
May	40572,527	240911,321	105889,765	177221	2,462,799
June	40055,107	249130,416	120857,939	187692	2,439,737
July	41433,285	266215,860	133595,527	209222	2,709,454
August	41466,217	265988,164	128844,761	182329	2,742,077
Sept	39850,472	247748,982	121880,684	153722	2,253,060
Oct	41552,711	255508,991	128504,541	176702	3,166,678
Nov.	40171,717	255138,911	155578,574	173843	2,208,418
Dec.	41542,991	272215,895	143996,198	184926	2,317,159
2000	516503,455	2,908,438,356	1,402,788,527	1,406,210	36,523,844
Jan.	41741,368	267318,404	136121,010	142518	2,516,349
Feb.	39128,273	259744,093	124312,100	139488	2,344,166
Mar.	41788,438	265021,850	136444,044	141638	2,570,350
Apr.	42127,580	212876,653	96819,484	124036	2,530,771
May	43484,776	237225,885	101259,138	74608	2,900,917
June	42444,997	224410,189	102102,272	81672	2,786,056
July	43390,128	228232,520	111629,136	126784	3,468,566
August	45044,801	238843,815	114913,450	106186	3,357,122
Sept	42661,863	246656,530	117622,161	111016	3,397,856
Oct	46208,210	241080,237	113870,123	119540	3,528,364
Nov.	44943,207	234752,054	116247,099	117162	3,433,646
Dec.	43539,814	252276,126	131448,510	121562	3,689,681

2. Oil and Gas Extraction Indexes, 1993 average = 100

Cude Oil and Natural LNG LPG Geo-

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	Condensate	Gas			thermal
1993	1000	1000	1000	100.0	1000
Jan.	1050	1042	1074	109.8	1097
Feb.	950	937	959	932	978
Mar.	1046	1042	1059	104.6	1079
Apr.	969	878	81.1	100.4	1000
May	1006	950	906	966	1095
June	977	967	96.1	978	754
July	1015	1004	1023	105.8	1091
August	1015	101.0	994	789	964
Sept.	98.1	974	940	110.6	983
Oct.	1022	1050	1047	104.1	1070
Nov.	967	1036	1060	923	833
Dec.	1001	1110	1168	106.0	1057
1994	1007	1106	1086	138.9	963
Jan.	1033	1113	1207	108.2	1068
Feb.	932	1020	1082	993	1008
Mar.	1029	1132	1164	110.4	1182
Apr.	984	97.1	883	963	1008
May	1012	1024	915	199.5	1029
June	987	1074	966	101.5	982
July	1034	1128	1074	101.1	716
August	1024	1177	115.1	323.0	1039
Sept.	988	1108	1055	230.6	960
Oct.	1041	1172	1121	960	984
Nov.	994	1173	1182	996	878
Dec.	1024	1173	1226	101.2	702
1995	999	1128	101.1	139.2	1807
Jan.	1019	117.1	1074	101.1	2118
Feb.	929	1104	115.1	323.0	1914
Mar.	1027	1209	1055	230.6	2083
Apr.	978	1064	96.1	940	2004
May	1012	1133	100.1	104.3	1973
June	979	1103	980	103.2	1609
July	1016	111.1	942	106.4	1523
August	1023	1148	1028	141.2	1935
Sept.	98.1	103.1	884	102.7	163.1
Oct.	1012	1105	925	108.7	1820
Nov.	986	1127	997	134.0	1600
Dec.	1028	1234	1135	121.6	1473
1996	1012	1189	1070	115.8	1923
Jan.	1033	1255	1198	127.9	1993
Feb.	96.1	1169	1138	144.9	1763
Mar.	1026	123.7	1175	121.4	2395
Apr.	985	1127	1003	114.5	1884
May	1009	1120	934	109.2	184.1
June	975	1074	879	107.3	1823
July	1016	1154	1000	117.1	1838
August	1018	1204	1087	120.8	2004
Sept.	973	1153	1007	102.1	173.7
Oct.	1019	1266	1060	109.8	2078
Nov.	1103	123.1	1158	104.9	1660
Dec.	1024	1276	1200	109.9	2058
1997	995	1189	1105	986	2314
Jan.	1022	1245	1209	113.4	190.1
Feb.	92.1	1142	1087	947	1673
Mar.	102.1	1254	1186	963	196.1
Apr.	983	1208	1112	952	1840
May	1008	118.7	1067	87.7	2127
June	964	1075	882	882	2076
July	1007	1186	1047	101.2	2210

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August	1012	1230	1151	907	2514
Sept	973	1126	1013	951	2336
Oct.	1001	1162	1073	915	2753
Nov.	981	1185	1160	110.6	2980
Dec.	1049	1261	1279	118.4	3398
1998	982	1118	1091	822	3106
Jan.	1043	1206	1213	100.0	3200
Feb.	944	1078	1176	81.1	2637
Mar.	1004	1128	1079	83.1	2956
Apr.	966	1040	935	82.6	2602
May	996	1064	91.7	744	2738
June	967	1035	893	700	3157
July	987	1138	1150	750	3427
August	976	1181	121.7	938	3313
Sept	93.1	1090	1122	81.4	313.1
Oct.	96.1	1090	1089	783	337.6
Nov.	103.1	1160	1215	85.1	327.8
Dec.	975	1212	1089	81.7	3463
1999	905	1152	1214	799	3170
Jan.	972	1202	1301	924	3526
Feb.	878	1119	1176	791	3172
Mar.	966	1175	1214	907	3364
Apr.	886	1076	1055	827	2915
May	889	1085	1002	752	3041
June	878	1122	1143	797	3013
July	908	1199	1264	888	3346
August	909	1198	1219	774	3386
Sept	874	111.6	1153	653	2782
Oct.	91.1	115.1	1215	750	3910
Nov.	88.1	1149	147.1	738	2727
Dec.	91.1	122.6	1362	785	286.1
2000	944	1092	1106	497	3759
Jan.	91.5	1204	1287	605	3107
Feb.	858	1170	1176	592	2895
Mar.	91.6	1194	1290	601	3174
Apr.	923	959	91.6	527	3125
May	953	1069	958	31.7	3582
June	930	101.1	966	34.7	3440
July	95.1	1028	1056	538	4283
August	98.7	1076	1087	45.1	4146
Sept	935	111.1	1112	47.1	4196
Oct.	101.3	1086	1077	50.7	4357
Nov.	985	1057	1099	49.7	4240
Dec.	95.4	1136	1243	51.6	4556

3. Oil and Gas Extraction Values and Proportions, 1993 and 1999

	Crude Oil and Condensate	Natural Gas	LNG	LPG	Geo- thermal	Total Oil and Gas
production in 1993:	5474302	26639	1268772086	28269	97176	
unit value						
1993	3400	331186		0.14	623	
1999	17955	1549095		61.24	3589	
gross val. in 1993						
1993 pr.	1861325	882246		38	6055	2749665
1999 pr.	9829109	4126634		17313	34878	14007934
proportion in 1993:						
1993 pr.	0.677	0.321		0.000014	0.002	1.000
1999 pr.	0.702	0.295		0.001	0.002	1.000

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B. NON-OIL MINERALS**1. Production in physical units**

	Tin (metr. tons)	Nickel (metr. tons)	Bauxite (metr. tons)	Iron Sand (metr. tons)	Coal (metr. tons)	Copper (metr. tons)	Gold (kg.)	Silver (kg.)
1993	28636	1975,813	1320,418	341,335	27584,418	928,189	41,576	90285
Jan.	28586	1975,813	1320,418	341,335	27569,435	928,189	42,084	90285
Feb.	1800	227,894	109,796	24,729	1,954,809	66,958	2,700	7,494
Mar.	1800	207,473	107,542	22,334	1,957,382	65,540	2,834	6,699
Apr.	1890	154,516	112,405	21,728	1,916,643	77,509	3,258	7,072
May	2775	221,105	117,575	28,637	2,061,365	68,239	2,893	6,640
June	2850	175,211	104,273	34,873	2,344,591	65,006	2,801	7,457
July	2645	204,224	103,873	29,314	2,200,731	45,389	2,383	7,282
August	2450	216,064	105,146	25,672	2,550,772	55,905	2,715	8,482
Sept.	2560	143,297	101,892	27,923	2,450,507	88,181	3,873	6,250
Oct.	2570	103,088	105,914	28,197	2,521,934	95,193	4,093	9,054
Nov.	2435	79,522	118,388	32,274	2,549,249	95,563	4,594	8,436
Dec.	2390	162,722	114,251	34,583	2,490,434	94,937	4,946	7,256
1994	2471	80,697	119,363	31,071	2,586,001	109,769	4,486	8,163
Jan.	30,610	2311,510	1342,402	334,895	31,012,115	1,065,468	42,597	07,026
Feb.	1,825	190,225	103,747	31,695	2,410,185	87,923	3,735	7,052
Mar.	1,825	180,226	120,319	27,950	1,963,894	76,928	3,460	5,840
Apr.	2,380	179,566	123,929	24,171	2,324,280	76,935	3,405	6,973
May	2,770	211,482	139,069	26,183	2,450,111	76,456	5,277	5,703
June	2,800	162,150	126,630	27,006	2,460,368	70,557	2,695	7,374
July	2,650	201,603	124,174	32,190	2,478,831	82,289	3,447	9,265
August	2,775	221,145	91,993	26,772	2,665,602	90,535	3,541	9,309
Sept.	2,950	194,661	129,131	25,522	2,521,871	92,800	3,544	10,821
Oct.	2,895	191,398	128,749	23,972	2,823,134	92,941	3,390	11,389
Nov.	2,940	178,974	127,273	27,950	3,115,369	93,723	3,680	11,352
Dec.	2,670	186,863	64,522	29,699	2,876,824	103,626	3,752	10,490
1995	2,620	213,217	62,866	31,785	3,147,989	120,755	4,672	11,459
Jan.	38,378	2513,394	899,035	352,371	41,421,699	1,516,605	62,818	265,212
Feb.	2,305	131,472	21,186	25,615	2,323,613	90,412	3,790	16,821
Mar.	2,340	167,318	38,481	26,077	3,294,786	78,352	3,782	19,270
Apr.	2,460	183,433	68,438	29,728	3,092,435	116,850	5,483	29,524
May	2,470	175,449	72,918	38,952	3,200,186	116,044	4,935	20,415
June	2,740	145,296	69,836	32,807	3,370,392	126,727	4,490	19,715
July	2,750	234,724	84,446	30,364	2,484,291	128,103	5,438	24,183
August	2,860	225,802	113,270	29,192	3,792,744	150,806	6,039	23,632
Sept.	4,509	231,723	103,737	26,341	3,840,048	140,009	4,757	18,698
Oct.	4,408	230,251	89,286	26,263	3,499,982	132,322	5,337	23,238
Nov.	4,139	221,298	85,720	25,721	3,929,701	149,703	6,111	25,169
Dec.	3,644	264,729	78,254	31,806	3,906,834	140,400	6,509	23,076
1996	3,753	301,899	73,463	29,505	4,781,710	146,877	6,147	21,471
Jan.	51,024	3426,863	841,976	425,101	50,332,047	1,758,905	83,564	25,404
Feb.	3,984	311,084	78,468	31,581	3,458,501	130,340	5,625	29,156
Mar.	3,263	239,377	43,421	27,109	3,131,423	118,685	4,874	16,972
Apr.	3,999	272,062	67,561	26,293	3,735,031	128,670	5,610	17,384
May	3,397	205,611	53,879	31,646	3,619,228	142,060	6,439	19,005
June	4,245	227,662	66,297	36,627	4,266,190	153,050	7,463	18,233
July	4,493	218,016	51,453	35,078	4,334,955	152,910	6,841	17,720
August	4,598	212,692	50,270	36,817	4,253,094	147,920	7,706	20,341
Sept.	5,004	301,686	59,053	37,911	4,093,942	143,310	6,606	20,595
Oct.	4,530	351,725	81,740	33,049	4,168,811	153,580	2,668	15,257
Nov.	5,503	301,727	80,280	28,946	4,171,073	169,080	8,139	24,190
Dec.	4,845	360,943	73,287	38,811	4,216,828	161,550	8,669	22,178
1997	3,163	424,278	136,267	61,233	3,889,533	157,750	13,020	33,862
Jan.	55,175	2829,936	808,749	487,444	54,608,396	1,840,702	89,979	29,160
Feb.	4,476	298,813	76,749	43,784	4,004,531	144,540	7,245	21,482

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Feb.	3803	217,778	51,458	23360	3,463,033	110,700	5,715	23,467
Mar.	4,564	266,497	68,660	39,608	4,433,742	143,330	6,003	18,399
Apr.	4,054	229,804	60,906	37,186	4,855,026	138,740	6,275	17,481
May	4,428	221,181	68,326	39,451	5,063,075	142,870	6,150	16,533
June	4,666	244,305	62,481	38,498	4,865,350	169,650	7,363	17,079
July	4,748	175,168	74,977	39,615	4,917,455	170,620	7,972	18,562
August	5,096	278,606	65,322	43,839	4,610,343	162,980	8,372	22,607
Sept.	5,330	274,625	47,358	37,584	3,937,577	148,910	6,897	23,166
Oct.	4,734	269,169	72,287	46,099	3,245,208	166,090	8,726	28,024
Nov.	4,416	195,247	72,874	51,299	4,195,404	169,760	10,026	32,241
Dec.	4,859	158,743	87,351	47,121	4,483,539	172,512	9,235	31,351
1998	53,959	2,736,640	1,055,647	560,524	60,320,952	2,640,040	124,019	34,974
Jan.	4,039	183,993	49,293	51,694	4,760,792	150,190	8,121	29,204
Feb.	3,531	182,604	54,068	41,440	4,460,332	157,900	5,582	16,625
Mar.	4,165	193,965	65,999	48,005	5,006,974	225,980	11,005	25,593
Apr.	4,497	186,064	53,992	47,063	4,708,504	196,480	10,159	27,205
May	4,887	234,793	67,439	47,840	5,201,069	208,090	8,520	26,532
June	4,940	238,113	57,933	46,786	4,890,128	195,730	8,206	28,831
July	5,212	184,102	67,634	43,503	5,173,545	233,620	8,248	28,409
August	5,558	238,480	97,038	38,551	5,000,874	223,210	10,879	25,255
Sept.	4,646	244,014	107,086	41,282	5,182,265	249,160	9,976	26,801
Oct.	4,805	263,456	132,364	49,221	5,286,442	244,970	9,664	33,355
Nov.	4,010	278,463	158,681	50,244	5,219,145	261,960	14,382	38,773
Dec.	3,669	308,593	144,120	54,895	5,430,878	292,750	19,277	42,391
1999	47,753	3,235,286	1,142,544	562,312	70,702,680	2,645,180	129,032	29,231
Jan.	3,369	223,724	91,277	34,897	5,138,355	226,230	12,162	29,319
Feb.	3,571	231,105	101,226	44,484	5,082,359	186,950	7,596	22,700
Mar.	3,571	222,150	128,880	54,650	5,877,209	234,330	10,544	28,504
Apr.	4,110	314,316	100,153	54,345	5,716,374	189,000	7,708	24,864
May	4,287	215,143	94,193	37,543	5,892,653	222,910	10,466	23,723
June	4,294	240,075	86,046	40,302	6,134,369	266,960	12,044	28,088
July	4,446	232,122	93,504	47,519	6,391,238	266,900	10,969	28,303
August	3,556	257,358	91,960	43,389	6,930,090	241,310	12,266	24,288
Sept.	4,425	285,624	99,116	46,966	6,394,658	188,570	10,264	20,131
Oct.	4,505	345,048	84,358	52,493	6,230,832	210,640	12,063	20,690
Nov.	3,817	316,158	81,880	52,250	4,813,913	196,010	9,690	17,854
Dec.	3,802	352,463	89,951	53,474	6,100,630	215,370	13,260	23,917
2000								
Jan.	2,966	197,838	96,509	39,153	5,250,358	240,460	10,012	19,406
Feb.	3,056	253,717	104,936	43,274	5,302,332	230,639	10,900	24,613
Mar.	3,378	243,255	110,991	44,979	5,436,511	259,431	10,790	26,551
Apr.	3,591	202,023	96,647	42,167	4,539,291	232,798	8,294	20,471
May	4,742	243,882	96,270	43,575	5,831,615	235,094	7,198	23,204
June	4,490	175,077	80,853	42,372	5,668,557	250,949	8,363	25,166
July	4,628	287,825	88,571	43,397	3,609,743	251,270	9,135	26,828
August	4,756	278,231	102,249	43,153	4,530,113	284,180	9,597	31,820
Sept.	5,058	381,934	88,792	43,929	4,511,502	285,717	8,209	29,930
Oct.								
Nov.								
Dec.								

2. Non-Oil Mineral Indexes, 1993 average = 100

	Tin	Nickel	Bauxite	Iron Sand	Coal	Copper	Gold	Silver
1993	1000	1000	1000	100.0	1000	1000	1000	1000
Jan.	756	1384	998	869	85.1	866	770	996
Feb.	756	1260	977	785	85.2	847	808	890
Mar.	793	938	1022	764	83.4	1002	929	940
Apr.	1165	1343	1069	100.7	89.7	882	825	882
May	1196	1064	948	122.6	102.1	840	799	99.1

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June	1110	1240	944	103.1	958	587	679	968
July	1028	1312	956	903	1110	723	774	1127
August	1075	870	926	982	1067	1140	1104	83.1
Sept	1079	626	963	991	1098	123.1	1167	1203
Oct.	1022	483	1076	113.5	1110	1235	131.0	112.1
Nov.	1003	988	1038	121.6	1084	1227	141.0	964
Dec.	1037	490	1085	109.2	1126	141.9	127.9	1085
1994	107.1	1170	101.7	98.1	1125	1148	101.2	1185
Jan.	766	1155	943	111.4	1049	113.7	1065	93.7
Feb.	766	1095	1093	983	855	995	986	776
Mar.	999	109.1	1126	850	1012	995	97.1	927
Apr.	1163	1284	1264	920	1066	988	1505	758
May	1175	985	1151	949	107.1	912	768	980
June	1112	1224	1128	113.2	1079	1064	983	123.1
July	1165	1343	836	941	1160	1170	101.0	123.7
August	1238	1182	1174	897	1098	1200	101.1	143.8
Sept	1215	1162	1170	843	1229	1202	96.7	151.4
Oct.	1234	1087	115.7	983	1356	121.2	1049	150.9
Nov.	1121	1135	586	104.4	1252	1340	107.0	139.4
Dec.	1100	1295	57.1	111.7	1370	156.1	133.2	152.3
1995	1343	1272	68.1	103.2	1502	1634	1493	293.7
Jan.	968	798	193	90.1	101.1	1169	108.1	223.6
Feb.	982	101.6	350	91.7	1434	101.3	107.8	256.1
Mar.	1033	1114	622	104.5	1346	151.1	156.3	392.4
Apr.	1037	1066	663	136.9	1393	1500	140.7	271.3
May	1150	882	635	115.3	1467	1638	128.0	262.0
June	1154	1426	767	106.7	1081	1656	155.1	321.4
July	1201	1371	1029	102.6	165.1	1950	172.2	314.1
August	1893	140.7	943	92.6	167.1	181.0	135.6	248.5
Sept	1850	1398	81.1	92.3	152.3	171.1	152.2	308.9
Oct.	173.7	1344	779	90.4	171.0	193.5	174.3	334.5
Nov.	1530	1608	71.1	111.8	170.1	181.5	185.6	306.7
Dec.	1575	1834	668	103.7	208.1	189.9	175.3	285.4
1996	1785	1734	638	124.5	182.6	189.5	198.6	282.9
Jan.	1672	1889	713	111.0	150.5	168.5	160.4	387.5
Feb.	1370	1454	395	95.3	136.3	153.4	139.0	225.6
Mar.	1679	1652	614	92.4	162.6	166.3	160.0	231.1
Apr.	1426	1249	490	111.3	157.5	183.7	183.6	252.6
May	1782	1383	603	128.8	185.7	197.9	212.8	242.3
June	1886	1324	468	123.3	188.7	197.7	195.1	235.5
July	1930	1292	457	129.4	185.1	191.2	219.7	270.4
August	2101	1832	537	133.3	178.2	185.3	188.4	273.7
Sept	1902	2136	743	116.2	181.5	198.6	76.1	202.8
Oct.	231.0	1833	730	101.8	181.6	218.6	232.1	321.5
Nov.	203.4	2192	666	136.4	183.5	208.9	247.2	294.8
Dec.	1328	257.7	1238	215.3	169.3	208.9	371.3	450.1
1997	1930	1432	612	142.8	198.1	198.3	213.8	309.2
Jan.	1879	181.5	697	153.9	174.3	186.9	206.6	285.5
Feb.	1596	1323	468	82.1	150.7	143.1	163.0	311.9
Mar.	1916	161.9	624	139.2	193.0	185.3	171.2	244.5
Apr.	1702	1396	554	130.7	211.3	179.4	178.9	232.3
May	1859	1343	621	138.7	220.4	184.7	175.4	219.7
June	1959	1484	568	135.3	211.8	219.3	210.0	227.0
July	1993	1064	681	139.3	214.0	220.6	227.3	246.7
August	2139	1692	594	154.1	200.7	210.7	238.7	300.5
Sept	223.7	1668	430	132.1	171.4	192.5	196.7	307.9
Oct.	1987	1635	657	162.1	141.3	214.7	248.8	372.5
Nov.	1854	1186	662	180.3	182.6	219.5	285.9	428.5
Dec.	2040	964	794	165.7	195.2	223.0	263.3	416.7
1998	1888	1385	799	164.2	218.8	284.4	294.7	386.5
Jan.	1696	111.7	448	181.7	207.2	194.2	231.6	388.2
Feb.	1482	1109	491	145.7	194.1	204.1	159.2	221.0

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Mar.	1748	1178	600	168.8	2179	2922	3138	3402
Apr.	1888	1130	491	165.5	2049	2540	2897	3616
May	2051	1426	613	168.2	2264	2690	2429	3526
June	2074	1446	526	164.5	2128	2530	2340	3832
July	2188	1118	615	152.9	2252	3020	2352	3776
August	2333	1448	882	135.5	2177	2886	3102	3357
Sept	1950	1482	973	145.1	2256	3221	2845	3562
Oct.	201.7	1600	1203	173.0	2301	3167	2756	4433
Nov.	1683	1691	1442	176.6	2272	3387	4101	5153
Dec.	1540	1874	1310	193.0	2364	3785	5497	5634
1999	167.1	163.7	865	164.7	2565	2850	3066	3238
Jan.	141.4	1359	830	122.7	223.7	2925	3468	389.7
Feb.	1499	1404	920	156.4	221.2	241.7	2166	301.7
Mar.	1499	1349	1171	192.1	2558	3030	3007	3789
Apr.	1725	1909	910	191.1	2488	2443	2198	3305
May	1800	1307	856	132.0	2565	2882	2984	3153
June	1803	1458	782	141.7	2670	345.1	3434	3727
July	1866	1410	850	167.1	2782	345.1	3128	3762
August	1493	1563	836	152.5	3016	3120	3498	3228
Sept.	1858	1735	901	165.1	2783	2438	2927	2676
Oct.	1891	2096	767	184.5	2712	2723	3440	2750
Nov.	1602	1920	744	183.7	2095	2534	2763	2373
Dec.	1596	2141	817	188.0	2655	2784	3781	3179
2000								
Jan.	1245	1202	877	137.6	2285	3109	2855	2579
Feb.	1283	1541	954	152.1	2308	2982	3108	327.1
Mar.	1418	1477	1009	158.1	2366	3354	307.7	3529
Apr.	1507	1227	878	148.2	197.6	301.0	2365	272.1
May	199.1	148.1	875	153.2	2538	3039	2052	3084
June	1885	1063	735	149.0	2467	3244	2385	3345
July	1943	1748	805	152.6	157.1	3249	2605	3566
August	199.7	1690	929	151.7	197.2	3674	273.7	4229
Sept.	2123	2320	807	154.4	1964	3694	234.1	3978
Oct.								
Nov.								
Dec.								

3. Non-Oil Mineral Values and Proportions, 1993 and 1999

	Tin	Nickel	Bauxite	IronSand	Coal	Copper	Gold	Silver
Value of Production:								
1993	465	628	35	69	1964	2272	1084	28
1999	2101	2588	99	18	12443	36435	3107	129
Gross Val. Proportion in 1993:								
'93 prices	0.072	0.097	0.005	0.001	0.303	0.350	0.167	0.004
'99 prices	0.058	0.073	0.005	0.001	0.224	0.590	0.047	0.002

C. OIL AND NON-OIL WEIGHTED PRODUCTION INDEXES 1993 AND 1999 WEIGHTS

	Oil and Gas Extraction		Non-Oil Minerals	
	'93 weights (value of production or value added)	'99 weights	'93 weights (value of production or value added)	'99 weights
1993	100000	100000	1000	1000
Jan.	104722	104751	889	890
Feb.	94593	94626	876	872
Mar.	104456	104466	917	944
Apr.	94001	94247	943	934

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May	98812	98958	937	91.7
June	97365	97386	820	75.5
July	101.183	101.218	93.1	87.5
August	101.301	101.285	107.8	109.7
Sept	97888	97922	110.8	114.3
Oct.	103.150	103.080	112.0	114.2
Nov.	98900	98710	117.3	117.2
Dec.	103.628	103.351	118.6	125.4
1994	103.838	103.624	111.4	113.3
Jan.	105.853	105.649	107.1	109.2
Feb.	96.027	95.805	94.4	95.7
Mar.	106.227	105.970	100.6	100.5
Apr.	97.966	97.997	114.0	106.3
May	101.608	101.696	96.4	96.3
June	101.506	101.280	107.5	107.9
July	106.385	106.126	115.5	117.1
August	107.330	107.197	113.9	116.9
Sept	102.665	102.512	116.9	119.5
Oct.	108.275	107.917	121.9	122.9
Nov.	105.115	104.640	122.8	127.6
Dec.	107.102	106.700	140.0	145.6
1995	104.235	103.968	151.4	155.2
Jan.	106.991	106.621	105.5	108.7
Feb.	98.712	98.563	115.3	110.8
Mar.	108.783	108.491	140.2	141.9
Apr.	100.825	100.624	137.7	141.1
May	105.293	105.008	141.7	149.6
June	102.007	101.707	140.7	147.4
July	104.738	104.508	171.1	178.3
August	106.470	106.215	165.6	172.9
Sept	99.865	99.758	160.2	164.3
Oct.	104.359	104.148	176.2	181.7
Nov.	103.282	102.974	174.5	175.6
Dec.	109.502	108.998	189.7	190.4
1996	107.062	106.642	186.2	186.0
Jan.	110.627	110.103	164.0	165.4
Feb.	102.996	102.532	143.5	146.9
Mar.	109.694	109.204	163.8	164.7
Apr.	103.234	102.906	166.6	170.5
May	104.644	104.388	188.9	189.7
June	100.871	100.646	186.8	189.5
July	106.171	105.851	187.8	186.1
August	107.989	107.552	184.8	184.6
Sept	103.245	102.800	173.0	188.9
Oct.	110.031	109.422	206.6	208.4
Nov.	114.524	114.197	207.7	204.8
Dec.	110.718	110.096	222.2	203.8
1997	106.005	105.534	194.8	194.1
Jan.	109.563	109.016	185.7	184.2
Feb.	99.322	98.766	149.0	145.7
Mar.	109.742	109.149	183.0	184.5
Apr.	105.751	105.181	184.0	182.5
May	106.785	106.329	188.6	188.0
June	100.197	99.929	206.0	209.8
July	106.716	106.281	206.3	209.1
August	108.506	107.962	208.1	206.3
Sept	102.511	102.145	186.2	187.3
Oct.	105.615	105.231	191.9	194.7
Nov.	105.119	104.657	207.2	204.5
Dec.	112.239	111.766	207.7	207.9
1998	103.037	102.720	244.5	253.0
Jan.	109.998	109.625	194.6	191.0

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Feb.	99095	98776	179.7	1889
Mar.	104798	104506	246.8	2558
Apr.	99361	99198	226.0	2297
May	102185	102027	234.1	2443
June	99385	99237	223.3	231.7
July	104094	103737	242.0	2618
August	104705	104232	251.8	2589
Sept.	98682	98314	259.4	2774
Oct.	100749	100458	259.5	2764
Nov.	107729	107433	287.7	2940
Dec.	105664	105096	328.7	3266
1999	98925	98330	258.7	2629
Jan.	105107	104570	253.8	2584
Feb.	96027	95448	214.3	2225
Mar.	103852	103366	260.2	2702
Apr.	95172	94724	230.8	2354
May	95696	95226	256.1	2627
June	96110	95520	288.5	3020
July	100698	100001	286.8	303.1
August	100722	100017	287.1	2893
Sept.	95555	94946	250.6	2445
Oct.	99451	98887	270.8	2649
Nov.	97088	96418	230.2	233.7
Dec.	101621	100833	275.4	2676
2000	99728	99365		
Jan.	101261	100527	248.2	265.1
Feb.	96242	95448	252.6	2622
Mar.	101014	100311	267.4	285.7
Apr.	93969	93891	229.4	251.8
May	99603	99298	248.3	2694
June	96176	95966	254.1	2778
July	98317	98161	238.0	2644
August	102276	102069	267.4	2992
Sept.	99880	99455	268.1	3035
Oct.	104372	104215		
Nov.	101555	101399		
Dec.	102075	101647		

D. OTHER PRODUCTION AND INDEXE COMPONENTS

	Indexes, 1993=100		PLN Electricity Sales		Index, 1993=100
	Non-Oil Manufact.	Petroleum Refining	sales in industry	total	
1993	10000	1000	18,173		1000100.0
1994	10895	969	20,748		1142114.2
1995	11933	957	23,706		1304130.4
1996	12004	109.1	26,721	56,928	1469146.9
1997	12654	1105	29,357	57,609	1660166.0
1998	10346	1185	27,985	57,951	1682168.2
1999	10545	1250	31,338	58,662	1841184.1
2000	10908	129.1	28,273	59,272	203.7203.7
Jan. '93	91.96	109.1	1,479		97.7
Feb.	94.80	99.7	1,407		92.997.7
Mar.	89.26	110.1	1,388		91.792.9
Apr.	96.66	89.6	1,397		92.291.7
May	100.46	95.1	1,517		100.292.2
June	101.30	93.5	1,532		101.1100.2
July	107.81	104.3	1,578		104.2101.1
August	102.29	103.9	1,369		90.4104.2

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Sept	10656	970	1,579		104390.4
Oct	10500	1007	1,622		107,1104.3
Nov.	10292	969	1,665		1100107.1
Dec.	10099	1002	1,639		1082110.0
Jan. '94	9852	994	1,618		1069108.2
Feb.	9882	984	1,558		1029106.9
Mar.	8845	1044	1,489		983102.9
Apr.	10161	841	1,561		103,198.3
May	10607	986	1,710		1129103.1
June	11321	1014	1,742		1150112.9
July	11749	1123	1,784		1178115.0
August	11626	1129	1,848		122,1117.8
Sept	11671	959	1,794		1185122.1
Oct.	11759	713	1,859		1227118.5
Nov.	11553	913	1,904		1257122.7
Dec.	11712	932	1,881		1242125.7
Jan. '95	11371	944	1,923		1270124.2
Feb.	10852	929	1,831		1209127.0
Mar.	10264	1038	1,711		1130120.9
Apr.	11695	1004	1,885		1245113.0
May	12107	965	1,919		1267124.5
June	12753	942	1,998		1319126.7
July	12860	1074	2,064		1363131.9
August	12711	951	2,050		1353136.3
Sept	12489	825	2,057		1358135.3
Oct.	12510	934	2,074		1370135.8
Nov.	12125	876	2,089		1379137.0
Dec.	11455	1000	2,106		1391137.9
Jan. '96	11493	948	2,043	4358	1350139.1
Feb.	9276	934	1,781	4033	1249135.0
Mar.	11627	892	2,014	4352	1348124.9
Apr.	11865	1157	2,131	4488	1390134.8
May	12505	1230	2,197	4676	1448139.0
June	12278	1149	2,188	4714	1460144.8
July	12805	1258	2,330	4845	1500146.0
August	12518	1238	2,361	4957	1535150.0
Sept	12315	967	2,398	5080	1573153.5
Oct.	13005	1019	2,453	5,138	1591157.3
Nov.	12505	1070	2,439	5,152	1596159.1
Dec.	11850	1232	2,386	5,135	1590159.6
Jan. '97	12255	1188		5,039	1561159.0
Feb.	9774	932		4375	1355156.1
Mar.	12892	1012		5,063	1568135.5
Apr.	12711	1102		5,098	1579156.8
May	13180	1234		5,294	1640157.9
June	13366	1208		5,418	1678164.0
July	13561	1054		5,498	1703167.8
August	13527	1084		5,569	1725170.3
Sept	13462	1109		5,668	1755172.5
Oct.	13221	1067		5,795	1795175.5
Nov.	11776	1096		5,745	1779179.5
Dec.	12118	1173		5,747	1780177.9
Jan. '98	9833	1325		5,251	1626178.0
Feb.	8595	1199		4,977	1541162.6
Mar.	10882	1089		5,269	1632154.1
Apr.	10226	1127		5,376	1665163.2
May	9829	1062		5,326	1649166.5
June	10512	1108		5,382	1667164.9
July	10909	1153		5,454	1689166.7
August	10855	1232		5,560	1722168.9
Sept	10787	1304		5,591	173,1172.2
Oct.	11045	1306		5,674	175,7173.1

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Nov.	10094	1163	5604	1736175.7
Dec.	10586	1147	5709	1768173.6
Jan. '99	7693	131.7	5090	1576176.8
Feb.	9463	117.7	5477	1696157.6
Mar.	10746	133.2	5710	1768169.6
Apr.	10535	127.3	5847	181.1176.8
May	10672	107.1	5981	1852181.1
June	10428	126.4	5968	1848185.2
July	11067	132.1	6143	1903184.8
August	109.10	127.9	6063	1878190.3
Sept.	11220	122.7	6170	191.1187.8
Oct.	11403	140.9	6273	1943191.1
Nov.	11474	117.2	6324	1959194.3
Dec.	10925	115.9	6292	1949195.9
Jan. '00	7888	126.2	5712	1769194.9
Feb.	101.01	117.5	6249	1935176.9
Mar.	10761	131.0	6418	1988193.5
Apr.	101.36	124.7	6514	201.7198.8
May	111.10	144.4	6600	2044201.7
June	112.17	130.9	6624	205.1204.4
July	11688	121.6	6612	2048205.1
August	11930	135.3	6804	210.7204.8
Sept.	117.72	140.1	6907	213.9210.7
Oct.	11951	130.5	7022	217.5213.9
Nov.	11921	123.6	6953	215.3217.5
Dec.	10425	123.6	6504	201.4215.3
Jan. '01	111.17	137.8	6509	201.6201.4
Feb.	11647	108.3	6535	202.4201.6
Mar.	11806	122.4	6770	209.6202.4
Apr.	11700	137.1	7034	217.8209.6
May	12247	136.0	7178	222.3217.8
June	12285	134.1	7269	225.1222.3
			7376	228.4225.1
			7259	224.8228.4
				2248

E. EXPANDED PRODUCTION INDEXES

	Value of Prod. Wts.		Value Added Wts.	
	1993	1999	1993	1999
1993	1000	1000	1000	100.0
1994	107.6	107.8	106.9	107.0
1995	116.9	117.3	115.1	115.7
1996	120.4	120.2	119.5	119.6
1997	125.9	125.6	123.9	123.7
1998	111.3	110.4	113.1	113.5
1999	113.6	112.1	114.7	114.4
2000				
Jan. '93	95.1	94.7	96.9	96.6
Feb.	94.8	94.7	94.7	94.5
Mar.	93.2	92.8	95.4	95.3
Apr.	95.5	95.8	95.1	95.3
May	99.6	99.7	99.3	99.2
June	99.5	99.4	98.7	98.1
July	105.9	105.9	104.8	104.4
August	102.1	102.3	102.0	102.5
Sept.	104.7	105.0	103.5	103.9
Oct.	104.7	104.9	104.5	104.8
Nov.	102.6	102.6	102.2	102.2

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Dec.	1022	1023	1028	103.2
Jan. '94	1002	1001	1014	101.4
Feb.	983	983	979	97.7
Mar.	929	925	956	95.3
Apr.	1003	1004	999	99.9
May	1048	1048	1040	103.8
June	1105	1107	1087	108.7
July	1154	1155	1138	113.8
August	1148	1148	1135	113.4
Sept.	1132	1137	1112	111.5
Oct.	1132	1141	1119	112.5
Nov.	1128	1133	1114	111.7
Dec.	1149	1155	1138	114.5
Jan. '95	1115	1117	1104	110.3
Feb.	1066	1065	1052	104.9
Mar.	1053	1051	1066	106.9
Apr.	1143	1146	1123	112.7
May	1179	1185	1159	116.7
June	1220	1228	1185	119.3
July	1252	1258	1224	123.4
August	1233	1241	1209	122.0
Sept.	1197	1206	1166	117.5
Oct.	1219	1226	1196	120.7
Nov.	1185	1190	1167	117.4
Dec.	1161	1161	1164	116.9
Jan. '96	1152	1153	1152	115.6
Feb.	971	967	992	99.2
Mar.	1156	1159	1152	115.7
Apr.	1184	1183	1169	117.1
May	1247	1244	1227	122.9
June	1219	1218	1196	120.0
July	1274	1270	1251	125.0
August	1254	1250	1238	123.6
Sept.	121.1	121.6	1189	119.8
Oct.	1286	1288	1268	127.3
Nov.	1261	1259	1257	125.9
Dec.	1225	121.1	1228	121.7
Jan. '97	1236	1230	1226	122.3
Feb.	1006	1000	1015	100.9
Mar.	1268	1270	1248	125.0
Apr.	1256	1254	1234	123.2
May	1304	1300	1276	127.4
June	1313	131.1	1275	127.8
July	1327	1328	1295	129.9
August	1330	1329	1302	130.2
Sept.	1312	131.0	1273	127.1
Oct.	1300	1298	1269	126.8
Nov.	1202	1194	1196	119.0
Dec.	1243	1235	1242	123.7
Jan. '98	1078	1060	1107	109.6
Feb.	956	942	988	98.3
Mar.	1147	1142	1159	116.8
Apr.	1088	1078	1100	110.0
May	1062	1054	1085	109.1
June	1106	1099	1114	111.7
July	1152	1149	1163	117.5
August	1159	1149	1173	117.6
Sept.	1153	1145	1161	117.0
Oct.	1176	1168	1182	119.1
Nov.	111.7	1106	1152	115.9
Dec.	1163	115.1	1193	120.0
Jan. '99	936	915	1000	99.7

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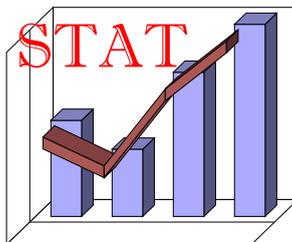
Feb.	1029	101.6	104.7	104.3
Mar.	1161	114.9	117.7	118.0
Apr.	1120	110.6	112.3	111.7
May	1127	111.7	113.1	113.3
June	1134	112.3	114.8	115.4
July	1192	118.1	120.2	120.9
August	1177	116.2	119.0	118.9
Sept.	1177	116.0	117.2	116.1
Oct.	1216	119.6	121.7	120.7
Nov.	1188	117.6	117.8	117.1
Dec.	1169	115.2	118.1	117.2
Jan. '00	944	92.6	99.9	99.8
Feb.	1095	108.1	110.9	110.6
Mar.	1166	115.4	117.8	118.1
Apr.	1094	108.3	110.1	110.1
May	1193	118.0	119.6	119.6
June	1189	117.9	118.5	119.0
July	1213	120.9	120.3	121.0
August	1258	125.3	125.4	126.5
Sept.	1248	124.1	124.3	125.4
Oct.				
Nov.				
Dec.				

AGGREGATE RICE DATA IN INDONESIA: A BRIEF OVERVIEW

Report # 48
Statistical Paper # 13

by
Suwandhi Sastrotaruno
Choiril Maksum

February, 2002



Statistical Assistance to the Government of Indonesia (STAT) Project
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February 26, 200

Aggregate Rice Data in Indonesia: A Brief Overview

I. INTRODUCTION

Rice is the single most important agricultural commodity in Indonesia and one of the most critical barometers watched by policy makers. For years, observers of the Indonesian economy have debated developments involving this commodity and its consequences with regards to the poverty situation in the country. Data related to rice production and consumption have been analyzed and subjected to consistency and plausibility checks. Many observers outside BPS have tended to believe that the gap between aggregate rice production and consumption was probably due to an under-statement of consumption. Some micro household studies in urban areas, which looked at caloric intake or nutritional status of specific household members, may have supported such a conclusion.

This report provides a brief documentation of how aggregate rice consumption and production data have been computed by BPS over the past decades. It argues that the discrepancy between the two measures is due more to an over-statement of production rather than an under-statement of consumption.

II. PRODUCTION

Rice data collection in Indonesia is based on the Minister of Agriculture Decree Number 527/Kpts/DP/11/1970 of November 9, 1970, followed by the Memorandum of Understanding between the Director General of Food Crops and the Director General of BPS Number SK. 47/DDP/XI/1972 of November 20, 1970. Based on these decisions, data collection covers two types of data:

- data collected by sub-district offices for Agricultural Extension Services (AES). Officials are referred to as “mantri tani”. Data on area harvested are collected monthly by these offices and reported to BPS and the Ministry of Agriculture.
- data collected by both “mantri tani” and BPS officials (“mantri statistik”). Fifty percent of data on yield are collected by BPS officials and the other fifty percent by AES sub-district offices.

Production of paddy for a particular time period (t) would then be calculated as:

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$$Q_t = A_t y_t$$

where

Q_t	is paddy production, normally measured in thousand tons of dry paddy ready for milling,
A_t	is area harvested, measured in thousand hectares and
y_t	is yield, measured in tons per hectare.

Production of rice is then calculated by multiplying Q_t by a paddy-to-rice conversion factor: until 1986 that factor was 68 percent, between 1987 and 1995 it was 65 percent (based on a post-harvest survey in 1986), and since 1996 it was 63.2%.

A. Area Harvested

The area harvested is calculated based on an “*eye estimate*” by AES officials. They would report every month on their estimate of the previous month’s area of standing crops, area harvested, area damaged (by pests or other causes) and new planting by type of intensification. They are also required to report their estimate of the current month’s standing crops (although this is only used as a plausibility check). This method of estimation was designed to produce reliable indicators of *change* in the size of areas harvested, rather than their *levels*.

B. Yield

Until 1994, the following methodology was used. Based on a survey of areas harvested, provinces were classified into two categories: “potential” and “non-potential”. Provinces were then arranged by declining size of areas harvested. Provinces covering cumulatively about 90 percent of areas harvested were then considered as “potential” areas, and the others as “non-potential.” The distinction between the two types of province was important, as the allocation of enumeration areas for “potential” provinces was done by the BPS head office whereas that of “non-potential” provinces was done by provincial offices themselves.

Starting in 1994, selection of enumeration areas was simplified. Instead of classifying provinces into “potential” and “non-potential”, only enumeration areas in what was deemed the most “normal” preceding year would be used to determine the number of enumeration areas to be selected, and a sample of enumeration areas would be selected using the Probability Proportional to Size (PPS) method. From a sampling perspective, this method was preferable

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because it produced a sample which was proportional to the size of areas harvested, unlike the previous method.

The yield per hectare is computed in several steps:

- Once enumeration areas are selected (using PPS), each selected enumeration area is enumerated to identify people engaged in paddy planting and to ask them when he/she will be harvesting.
- The enumerator then selects around five fields for harvesting.
- The enumerator brings with him to the harvested field a 10.5 kg measurement tool, which consists of: an iron (or copper) rectangle, a tripod and a weighing scale. In that field, the enumerator selects randomly a plot of 2.5 m x 2.5 m and puts the rectangle over the selected paddy plot.
- The paddy within the rectangle is then harvested, shed and the paddy grain is placed in a plastic bag, weighed and reported on a special form as the estimated yield of that plot. Around 110,000 reports are usually received by BPS.
- The average yield in the reports is then multiplied by 1600 to obtain the yield per hectare.

These steps are applied to two types of land: irrigated (wet land paddy, “sawah”) and non-irrigated (dry land paddy, “ladang”).

The estimate of yield at the district level in period t (y_{dt}) is calculated as an average¹ of yields for various plots in that district. That is,

$$y_{dt} = \sum y_{dit} / n_{dt}$$

where:

y_{dit} is the yield of the i -th plot in the district in period t and

n_{dt} is the number of plots selected in the district in period t .

Yield per province is calculated as a weighted average of district-level yields, using area harvested as the weight. Reported “yield per hectare” refers to harvested paddy, which will then be converted to dry paddy ready for milling.

¹ Since the PPS design is self-weighting, there is no need for further weighting.

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C. Accuracy

Production of paddy of wet land and dry land in Indonesia for the last thirty years, which has been published annually by BPS, is provided in Table 1.

Table 1
Area Harvested, Yield per Hectare and Paddy Production in Indonesia, 1969-2000

Year	Wet land paddy			Dry land paddy			Total		
	Area ¹⁾	Yield ²⁾	Prod ³⁾	Area ¹⁾	Yield ²⁾	Prod ³⁾	Area ¹⁾	Yield ²⁾	Prod ³⁾
1969	6544	3.28	21474	1470	1.42	2082	8014	2.94	23556
1970	6679	3.47	23149	1456	1.46	2121	8135	3.11	25270
1971	6893	3.53	24308	1432	1.46	2084	8325	3.17	26392
1972	6602	3.54	23402	1296	1.50	1949	7898	3.21	25351
1973	7064	3.67	25902	1340	1.63	2189	8404	3.34	28091
1974	7340	3.75	27531	1168	1.58	1846	8508	3.45	29377
1975	7334	3.72	27265	1161	1.67	1936	8495	3.44	29201
1976	7229	3.02	21852	1139	1.27	1449	8368	2.78	23301
1977	7202	3.03	21808	1157	1.33	1539	8359	2.79	23347
1978	7698	3.14	24172	1231	1.30	1599	8929	2.89	25771
1979	7675	3.22	24732	1128	1.38	1551	8803	2.99	26283
1980	7824	3.58	27993	1181	1.40	1659	9005	3.29	29652
1981	8191	3.78	30989	1191	1.50	1785	9382	3.49	32774
1982	7873	4.04	31776	1116	1.62	1808	8989	3.74	33584
1983	7987	4.17	33294	1176	1.71	2009	9163	3.85	35303
1984	8547	4.21	36017	1216	1.74	2119	9763	3.91	38136
1985	8756	4.23	37027	1147	1.75	2006	9903	3.94	39033
1986	8888	4.25	37740	1100	1.81	1987	9988	3.98	39727
1987	8796	4.32	37970	1126	1.87	2109	9922	4.04	40079
1988	8925	4.41	39316	1213	1.95	2360	10138	4.11	41676
1989	9375	4.52	42371	1156	2.04	2354	10531	4.25	44725
1990	9378	4.57	42825	1125	2.09	2353	10503	4.30	45178
1991	9169	4.62	42331	1113	2.12	2357	10282	4.35	44688
1992	9799	4.63	45414	1304	2.17	2826	11103	4.34	48240
1993	9807	4.65	45559	1206	2.17	2622	11013	4.37	48181
1994	9494	4.63	43959	1240	2.16	2682	10734	4.35	46641
1995	10081	4.64	46806	1358	2.16	2938	11439	4.35	49744
1996	10251	4.70	48188	1318	2.21	2913	11569	4.42	51101
1997	9882	4.71	46591	1259	2.21	2785	11141	4.43	49376
1998	10476	4.44	46483	1255	2.19	2754	11731	4.20	49237
1999	10794	4.47	48201	1169	2.28	2665	11963	4.25	50866
2000	10618	4.63	49207	1176	2.29	2692	11793	4.40	51899

1) Area in thousand hectares

2) Yield per hectare in tons of dry paddy ready for milling

3) Production in thousand tons of dry paddy ready for milling

How accurate are these estimates? To answer this question one needs to evaluate the quality of the underlying components:

1. Area Harvested

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The use of *eye estimates* for this variable is admittedly subject to some margin of error, at times significant. However, unless the error in these estimates is systematic, the estimated levels may not diverge significantly from the true levels over time. Unfortunately, we believe that the error in these estimates has been systematic, and thus some bias has been introduced into the figures used for computing the series. Two BPS studies, one in North Sumatera and one in Java found a significant over-estimation of area harvested:

- the first survey was conducted between October 1989 and June 1990 in 11 districts of North Sumatera.² An integrated two-stage systematic random sampling design was used. In the first stage, fifty villages were selected with probability proportional to size of households engaged in farming. In the second stage, ten households were randomly selected within each village. The survey found that areas harvested had been over-estimated by an average 7.1%.³
- the second survey was conducted in 1996 covering all of Java except DKI Jakarta.⁴ Unlike the North Sumatera survey, this one was designed specifically for evaluating the accuracy of estimates based on the crop-cutting approach and comparing them with the statistically more reliable (but more expensive) household approach. The same two-stage sampling method used in the previous survey was applied, but coverage was far bigger: 6000 enumeration areas were included and over 262,000 households were enumerated. Thus, results of this survey are believed to be far more reliable than those of any previous one as far as paddy areas harvested are concerned. The survey found that areas harvested had been over-estimated by an average 17.1% (ranging from 13.1% in West Java to 22.9% in Yogyakarta).

That a bias exists in the estimation of areas harvested is, in our judgement, certain. The extent of that bias and its causes, however, are not quite clear. One possible cause may be the

² "Department of Agriculture Pilot Study on Agricultural Survey: Executive Summary," Bureau of Planning Ministry of Agriculture, National Planning Board and BPS, September, 1990. The survey was not limited to paddy production. It covered several crops. However, this report only includes results relevant to paddy.

³ Results by district varied widely: from an over-estimation of 57.6% (in North Tapanuli) to an under-estimation of 68.8% (in Labuhan Batu).

⁴ "Survei Luas Tanaman Padi Dengan Pendekatan Rumahtangga Di Jawa Tahun 1996/1997," BPS, October, 1998.

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difficulty of accurately measuring the rice producing portion of areas used for growing other seasonal crops. A further complicating factor may be the fact that information collected by sub-districts is based on outdated arable land data, which does not take into consideration reduction of arable land for new housing, roads or other conversions. Another cause of the bias may be the attitude of staff doing the estimation: showing an increase (or at least no change) in the size of the area would meet the boss's expectations, whereas a decrease would not make him happy. Since rice is considered a strategic commodity, success of a particular region may have been measured by the growth in its rice production. Also the performance of AES officials may also have been measured by their success in bringing increasing numbers of farmers to plant rice. All these factors may have contributed to what we consider to be a significant over-statement of the level of harvested areas in the official figures.

2. Yield per Hectare

We believe that yield per hectare at the plot level is generally accurate, since it is a very simple activity and there is very little incentive to mis-report. Selection of the particular plot by the mantri tani or mantri statistik may be subject to some bias: since a heavy tool needs to be carried, the mantri may choose a plot closer to the road than one farther from the road. Earlier internal BPS studies comparing yields obtained from the mantri tani and those obtained from the mantri statistik suggested that the mantri tani tended to report higher yields than the mantri statistik, but the difference was statistically not significant. Thus, we believe that yield per hectare at the district level is also more or less accurate. Yields per hectare at the provincial level, by weighting areas harvested at the district level, and by being subject to an estimated sampling error of only five percent, should provide an accurate representation of that variable.

3. Summary

Overall then, we believe that while yield estimates have been more or less accurate, estimates of area harvested have been over-stated. If the BPS findings for Java can be applied to the rest of Indonesia, then the overstatement of area harvested, at least in the mid 1990's, has been about 17%, which means that rice production had been over-estimated by the same order of magnitude. The BPS Directorate of Agriculture is currently studying this issue in depth, using the extensive work planned under the 2003 Agriculture Census to provide a more

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accurate figure for this variable and a possible revision of the historical series.

III. CONSUMPTION

A. Computation

Data on consumption of rice in Indonesia are primarily based on per capita household consumption derived from the National Socio-Economic Survey (Susenas) expenditure module conducted once every three years since 1981; the latest one was conducted in 1999. Total per capita rice consumption is calculated as the sum of two components:

- per capita rice consumption by household members at home: i.e. rice obtained by the household in raw form and cooked and consumed within the household premises. This component is obtained directly once every three years from the Susenas survey.
- per capita rice consumption by household members outside its premises: i.e. rice consumed in restaurants, food stalls etc. Since a direct measure for this variable does not exist, this component is estimated by applying to the first component the share of prepared foods expenditure outside the household in total household food expenditure, which is obtained from the same Susenas module every three years. For example, if 10% of total food expenditure is found to take place outside the household, then rice consumption outside the household is also assumed to be 10% of total rice consumption, and the figure obtained for the first component (rice consumption within the household) would be inflated by dividing it by (1-10%).

Algebraically, this can be written as:

$$C_t = HC_t / (1 - p_t)$$

where:

C_t is per capita household consumption of rice in period t

HC_t is per capita household consumption of rice at home in period t, and

p_t is the share of prepared food expenditure outside the household in total food expenditure in period t.

One way of computing aggregate household rice consumption in Indonesia, which is the

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methodology used by BPS and documented in this report, would then be to multiply C_t by the estimated population in the country. Another way, which was not attempted in this report but which may provide different results,⁵ is to do the above computations at the district level, and separately for urban and rural households, then aggregate by province then for the whole nation. The strength of the latter method would be that it would allow differentiation of results by urban/rural and by geographic attribute. Whatever method one uses, such figures can only be computed once every three years. Between survey years, figures can be interpolated. BPS published figures apply a geometric interpolation.

Total household rice consumption is then added to estimates of rice consumed as a raw material in manufacturing obtained from input-output tables (NHC)⁶ to produce the BPS estimate for total rice consumption in Indonesia in a particular year (TC). Estimates for the last 30 years are provided in Table 2.

⁵ This may be attempted in the future and results could be compared with those in this report.

⁶ For years other than input-output table years, a constant ratio is used based on the previous input-output table.

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Table 2
Total Rice Consumption in Indonesia

Year	HC ¹⁾	p ²⁾	Pop ³⁾	C ⁴⁾	NHC ⁵⁾	TC ⁶⁾
1969	106.34	5.13	115261	12920	6	12926
1970	107.85	5.16	117567	13369	10	13379
1971	109.37	5.19	119930	13835	14	13849
1972	110.92	5.22	122621	14350	28	14378
1973	112.49	5.25	125372	14885	57	14942
1974	114.09	5.29	128184	15441	118	15559
1975	115.70	5.32	131060	16016	228	16244
1976	113.77	5.35	134000	16107	209	16316
1977	113.77	5.82	137007	16551	241	16792
1978	113.78	6.34	140080	17017	308	17325
1979	113.78	6.90	143223	17504	361	17865
1980	113.79	7.51	146436	18016	470	18486
1981	114.20	8.10	149335	18557	493	19050
1982	114.78	8.44	152291	19091	477	19568
1983	115.45	8.80	155308	19660	475	20135
1984	116.12	9.17	158383	20248	488	20736
1985	116.19	9.62	161520	20765	472	21237
1986	116.25	10.09	164718	21297	467	21764
1987	116.32	10.59	167980	21854	455	22309
1988	116.76	9.80	171306	22175	445	22620
1989	117.24	9.07	174698	22525	459	22984
1990	117.68	8.40	178157	22888	449	23337
1991	117.16	9.84	178797	23234	503	23737
1992	116.64	11.53	180461	23792	615	24407
1993	116.12	13.51	183491	24635	695	25330
1994	114.23	14.10	186510	24802	761	25563
1995	112.37	14.71	189522	24970	918	25888
1996	111.18	15.35	192451	25277	970	26247
1997	108.57	15.26	195300	25022	963	25985
1998	106.02	15.17	197856	24728	986	25714
1999	103.53	15.07	200353	24423	1045	25468
2000	101.10	14.98	203456	24194	1078	25272

Notes:

- 1) Per capita consumption of rice in the household (kg/year)
- 2) Percentage of prepared food expenditure outside the household, derived from Susenas. Between Susenas years, percentages were interpolated.
- 3) Total population in thousands
- 4) Total household consumption of rice (thousand tons)
- 5) Non-household rice consumption (thousand tons)
- 6) Total Consumption of rice (thousand tons)

B. Accuracy

How accurate are aggregate rice consumption data estimated using the above methodology? Short of conducting special surveys for this particular purpose, the best that one can do is to evaluate the plausibility of the most critical underlying data, namely those obtained from the Susenas module. Table 3 provides the weekly per capita household rice consumption,

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both the quantity and value, used in the computations provided earlier in Table 2. The average per capita household consumption figures, both the value and quantity, are highly plausible. The fact that the average quantity consumed remained more or less around the same realistic level (2.2 kg) increases our confidence in these figures.

Table 3
Per Capita Household Rice Consumption in Susenas
(1981-1999)

Year	Weekly Consumption (Rp)	Weekly Consumption (kg)	Implicit Rice Price (Rp/kg)	Average Rice Price in Indonesia (Rp/kg) ¹⁾
1981	539	2.25	240	261
1984	728	2.049	355	344
1987	904	2.240	404	403
1990	1274	2.263	563	549
1993	1404	2.233	629	644
1996	2090	2.138	978	983
1999	5382	1.991	2703	2809

1) Average consumer price in 27 provincial capital cities, BPS.

These results suggest that in the aggregate, while there may be some under-statement of rice consumption in Susenas because of the exclusion of rice consumed outside the household, that under-statement is probably not very high.

IV. CONSISTENCY OF AGGREGATES

The above sections dealt with BPS estimates of aggregate production and of aggregate consumption of rice in Indonesia and some of the weaknesses of these measures. One useful way to check plausibility of these figures is to compare totals for consistency, not for exact matching, but to see whether they suggest the same order of magnitude.

Consumption and production of rice are not directly comparable: not all production is consumed domestically and some consumed products may be imported. In attempting to evaluate consistency of aggregate figures, it is useful to start with the following identity:

$$Q_t + (M_t - X_t) = C_t + S_t$$

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where:

- Q_t is domestic production of rice in period t
- M_t import of rice
- X_t export
- C_t domestic consumption
- S_t change in stocks from $t-1$ to t .

What the identity says is basically that the domestic supply of rice (the left-hand side of the equation) is either consumed domestically or added to warehouses for future consumption (the right-hand side of the equation). Data on the stock of rice at the National Logistics Agency (Badan Urusan Logistik - BULOG) are available monthly, but data on the stock of rice at the farmer level, which are believed to constitute the bigger share, are not: to our knowledge, these data were only collected once in the 1986-87 post-harvest survey. Furthermore, although the level of stocks may fluctuate from year to year, over time it should theoretically average out to zero. That is why in our estimate of the total rice supply in the last 30 years (in Table 4), we have assumed that it was zero.

Table 4 provides a comparison of aggregate production, supply and consumption of rice over the past three decades.

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Table 4
Supply vs Consumption of Rice in Indonesia
(in thousand tons)

Year	Production	Net Imports ¹⁾	Supply	Consumption
1969	16018	238	16256	12926
1970	17184	324	17508	13379
1971	17947	120	18066	13849
1972	17239	335	17573	14378
1973	19102	1863	20965	14942
1974	19976	1132	21109	15559
1975	19857	693	20549	16244
1976	15845	1301	17146	16316
1977	15876	1973	17849	16792
1978	17524	1842	19366	17325
1979	17879	1922	19794	17872
1980	20163	2012	22175	18486
1981	22286	538	22825	19050
1982	22837	310	23147	19614
1983	24006	1169	25175	20226
1984	25933	414	26347	20736
1985	26542	34	26576	21200
1986	27014	28	27042	21682
1987	26051	55	26106	22309
1988	27089	33	27122	22620
1989	29071	268	29339	22984
1990	29366	49	29415	23337
1991	29047	171	29218	23737
1992	31356	608	31964	24407
1993	31318	23	31340	25330
1994	30317	630	30946	25563
1995	32334	1799	34132	25888
1996	33296	2143	34439	26247
1997	31206	285	31491	25985
1998	31118	2885	34002	25714
1999	32147	4503	36650	25468
2000	32800	1266	34066	25272

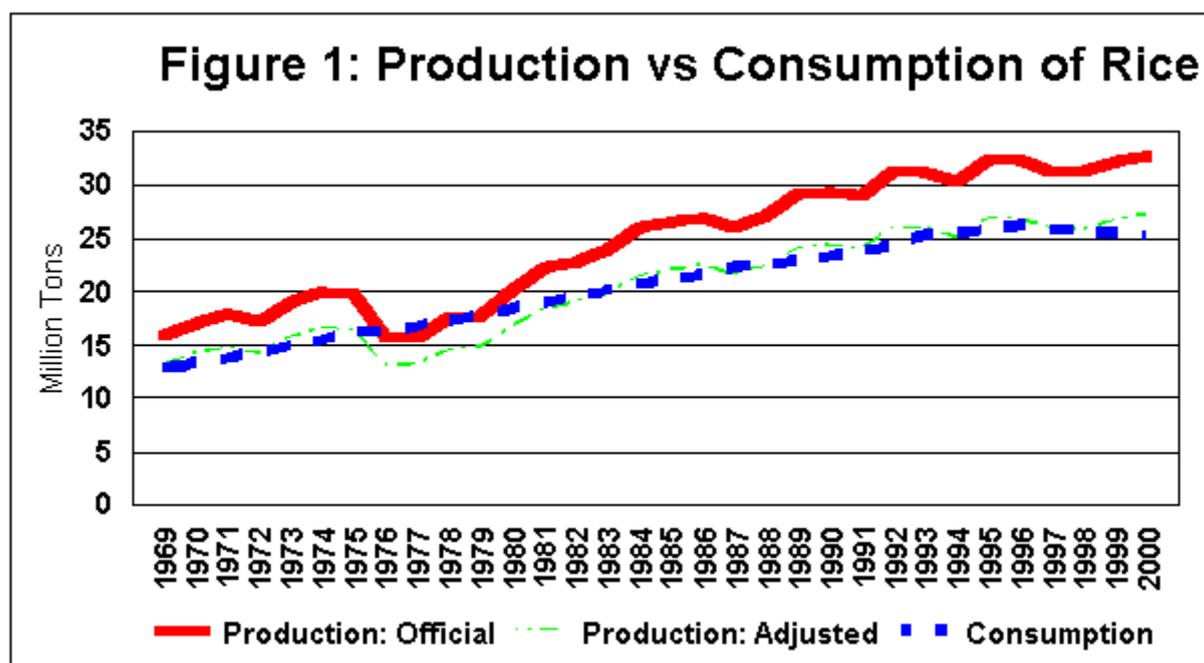
1) Imports minus exports

Supply and production figures do not differ substantially, since the only difference between them, namely net imports, have averaged about 4% of production. A significant implausible gap, therefore, exists between aggregate production and consumption. How to explain such a gap? Given our belief stated in Section II above that production figures have been over-stated, we have attempted to “adjust” them by our best guess at this point, which was derived from the extensive survey conducted in Java in 1996, that is, cutting production by 17%. The result, shown in Figure 1) is surprisingly close estimates for production and consumption for the entire 30-year period

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with the exception of 1976-1980.⁷ This strengthens our argument that the error lies more in the production, rather than the consumption, estimates.



V. CONCLUSIONS

The discussion in this report suggests one simple and pretty clear conclusion regarding aggregate estimates of rice production and consumption in Indonesia: both the estimates for production and consumption are subject to some margin of error; the error in the consumption estimate is likely to be small and that in the production estimate much larger. **Although total rice consumption in Indonesia may be understated, that of total rice production is almost certainly overstated, and by a significant margin. Our very rough calculation suggests that there is a net overstatement of production in the magnitude of about 17%.**

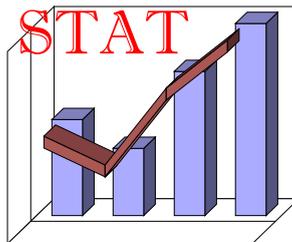
⁷ By historical standards, i.e. compared to the pre-1976 or the post-1980 periods, official estimates of production in the 1976-1980 period were far lower than usual. The main cause appears to be the historically unusual drop in 1976. The cause of that drop, as of the writing of this report, remains unclear.

TOWARD INCOME ACCOUNTS FOR INDONESIA

Report # 60
Statistical Paper # 14

by
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Toward Income Accounts for Indonesia

LIST OF ACRONYMS

BUMN	<i>Badan Usaha Milik Negara</i> (State-Owned Enterprise)
IO	Input-Output table
SAKERNAS	<i>Survei Angkatan Kerja Nasional</i> (National Labor Force Survey)
SAM	Social Accounting Matrix
SKTIR	<i>Survei Khusus Tabungan dan Investasi Rumah Tangga</i> (Special Survey of Household Saving and Investment)
SNA	System of National Accounts
SUSENAS	<i>Survei Sosial Ekonomi Nasional</i> (National Socio-economic Survey)

I. INTRODUCTION¹

There are three approaches to estimating GDP: the production, expenditure and income approaches. The *production approach* estimates GDP as the sum of value added created by all production units operating in the country. The *expenditure approach* estimates GDP as the sum of expenditures on final demand (i.e. consumption, capital formation and net exports). The *income approach* estimates GDP as the sum of remunerations to factors of production (capital, labor) in the country.

Income accounts provide information about two features of a national economy. First, they show how the GDP is divided among different types of income, such as compensation of employees, profits and other property income, so-called “mixed income” of owners of unincorporated business, and taxes (less subsidies) on production. Second, they help explain differences between a country’s GDP and its disposable income. Such differences can arise when, for example, profits from domestic production are paid to foreign owners of an enterprise, or when transfers are received from the rest of the world.

One drawback of the income approach is that, unlike the other two approaches, it does not support constant price (or volume) estimation, since some income components (e.g. mixed income, operating surplus) do not have an analytically meaningful volume dimension. The most common analytical use of the income approach is in depicting changes in relative shares of major components over time (e.g. employee compensation).

This report documents an attempt to develop income accounts for Indonesia, which can hopefully be regularly updated by BPS in the future. It provides (in Section II) a brief description of the conceptual framework for these accounts.² Section III describes the methodology used in computing an annual series for the 1990-2000 period. Finally Section IV presents the results and a few concluding remarks regarding followup steps.

II. CONCEPTUAL FRAMEWORK

A. Distribution of GDP by Income Type

The income side of the GDP can be divided into five major components: employee

¹ We would like to thank Frank de Leeuw for his comments on earlier versions of this report; Dyan Pramono and Uzair Suhaimi for their invaluable insight and suggestions in areas of their extensive expertise; and Aden Gultom, Emil Azman and Wiwiek Arumwaty for their assistance in providing data and in explaining the strengths and weaknesses of these data.

² For a more detailed discussion of definitions and accounting treatment, see *System of National Accounts 1993*, chapters VII and VIII--pp. 157-202.

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compensation, property income, mixed income, net taxes on production and consumption of fixed capital. In what follows, we will discuss briefly what these components cover.

1. Employee Compensation

Employee compensation includes:

- Wages and salaries, including cash bonuses, commissions etc.
- Supplements to labor income, e.g. employer contributions to social security, employee welfare funds and direct pension payments to retired employees.
- Compensation in kind, e.g. maintenance allowances, health and educational services etc.

2. Property Income

Property income (or capital income) includes:

- Dividends
- Undistributed profits of private corporations before taxes
- Interest on bonds, mortgages, and savings deposits
- Interest earned by insurance companies and credited to the insurance policy reserves
- Net interest paid out by commercial banks
- Net rents from land, buildings, etc., including imputed net rents on owner-occupied dwellings
- Royalties
- Profits of government enterprises.

3. Mixed Income

Mixed income (or operating surplus) includes:

- Earnings of the self-employed, whether taken in cash or retained in the enterprise (often referred to as “profits of unincorporated enterprises”)
- Incomes of the self-employed in kind (e.g. farm products consumed on the farm, services of farm dwellings).

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4. Taxes on Production (less subsidies)

Taxes are compulsory payments, in cash or in kind, made by institutional units to government units. Taxes covered in this category include those payable on goods and services when they are produced, delivered, sold, transferred or otherwise disposed of by their producers.³ In addition to sales and value-added taxes, these include:

- taxes and duties on imports that become payable when goods enter the economic territory of a country by crossing the frontier or when services are delivered to resident units by non-resident units.
- taxes on the ownership or use of land, buildings or other assets used in production or on the labor employed, or compensation of employees paid.

Subsidies are current transfer payments that government units (including non-resident units) make to enterprises on the basis of the levels of their production activities or of the quantities or values of the goods or services which they produce, sell or import.⁴

5. Consumption of Fixed Capital

Consumption of fixed capital (or depreciation) measures the degree to which the country's stock of fixed capital assets is used up. It is not measured directly. Rather, it is estimated indirectly based on the estimated level and composition of the capital stock.

B. Disposable Income

Disposable income is the balancing item in what is referred to in the 1993 SNA as the "secondary distribution of income account." It is derived from the sum of the five components of GDP discussed in the previous section (referred to in the 1993 SNA as the "primary distribution of income account"), by further:

- Adding all current transfers (except social transfers in kind), employee compensation and property income, received from the rest of the world, and
- Subtracting all current transfers (except social transfers in kind), employee

³ Taxes on production do not include income (or some property) taxes. The reason that production taxes are included is that businesses report earnings and profits after paying production taxes and before paying income (or some property) taxes. Including production taxes is necessary to make total income equal to total final expenditures at market prices.

⁴ The subtraction of subsidies, like the addition of production taxes, is necessary to make total income equal to total expenditures at market prices.

compensation and property income, paid to the rest of the world.

Disposable income, like the balance of primary incomes, may be recorded gross or net of consumption of fixed capital.

C. Sectors of the Economy

Each of the income components can be defined and measured separately for major sectors of the economy: namely, financial corporations, government, public enterprises, private nonfinancial corporations, and households.⁵ Thus, employee compensation consists of the sum of employee compensation in each of the five sectors. Separation by sector is useful for analyzing economic developments and is necessary to make use of the diverse data sources available for particular sectors.

III. METHODOLOGY

Estimates of income accounts for Indonesia require the use of a substantial number of data sources of varying frequency, coverage and quality. Table 1 summarizes the major data sources for each income component (the rows of the table) and for each sector of the economy (the columns of the table).

⁵ The 1993 SNA includes an additional sector: non-profit institutions serving households (NPISH). This covers non-profit institutions which “provide goods or services to households free or at prices that are not economically significant” (*System of National Accounts 1993*, IV.B.5 paragraph 4.64, p. 95). They include two main types of institutions: one consisting of those created by households for the provision of such services and the other consisting of charities and relief organizations. As it is difficult in Indonesia to separately account for activities of these institutions and of those of households, activities of both are included in what we refer to in this report as the “household” sector.

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Table 1
GDP by Income and Sector: Data Sources

Income Type	Financial Sector	Government	Public Enterprises	Private Non-Financial Corporations	Households	Total
	(A)	(B)	(C)	(D)	(E)	(F)
1. Employee Compensation	IO	Budget	Financials	HR	--	HHA
2. Property Income	VR	Budget	Financials	HR	HHA	HHA
3. Net Taxes on Production	IO	--	Financials	HR	--	IO
4. Consumption of fixed	IO	IO	Financials	HR	HHA	IO
5. Mixed Income	--	--	--	HR	HHA	VR
6. GDP	IO	CS	CS	HR	CS	IO

Notes:

IO: Input-Output table

Budget: Government budget

Financials: official financial statements of public enterprises

HR: Horizontal residual

VR: Vertical residual

CS: Column sum

HHA: derived from the reconciliation tables underlying the household sector account

"--": not applicable

This table reflects the procedure used in computing figures for 2000, a year for which an input-output (IO) table is currently being constructed by BPS. The input-output table draws on a large number of data sources for computing income estimates and checking their plausibility. Computations for other years were done at more aggregated levels given that detailed relevant tabulations were not available.

Let us now turn to the data sources consulted for filling various cells in the matrix (Table 1) for the estimation of figures for 2000. Cells in that matrix include a one-word summary description of the main source of data used for computing it. For ease of reference in the text, columns in the table have been labeled A through F and rows have been assigned numbers.

A. Computations for 2000

1. Financial Sector

This sector includes four broad categories of institutions: the central bank, commercial banks, insurance companies and non-bank financial institutions.

Employee Compensation

Total employee compensation (A1) was obtained from the IO table.⁶

⁶ Row 201 (*upah dan gaji*) and columns 157 (*bank dan lembaga keuangan lainnya*) and 158 (*asuransi*).

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Property Income

This item (A2) was derived as a column residual.

Net Taxes on Production

This item (A3) was also derived from the IO table, row 204 (*pajak tidak langsung*).

Consumption of Fixed Capital

This item (A4) was also derived from the IO table, row 203 (*penyusutan*). It is probably understated, because it is based on the historical cost of structures and machinery rather than on the conceptually correct (but extremely difficult to measure) current replacement cost. Understatement of this component will be matched by overstatement of property income.

Mixed Income

Mixed income is assumed to be zero for the financial sector.

GDP

This item (A6) was derived from the IO table, row 209 (*nilai tambah bruto*) and columns 157 (*bank dan lembaga keuangan lainnya*) and 158 (*asuransi*).

2. Government

This sector includes central, provincial, district/regency (*kabupaten/kota*), sub-district (*kecamatan*) as well as village (*desa*) governments. Central Government figures for all items in this column were obtained from actual expenditure accounts obtained regularly from the Ministry of Finance. Expenditure by governments at other levels were obtained from the annual BPS surveys of local authorities (*Statistik Keuangan Pemerintah Tingkat I, Statistik Keuangan Pemerintah Tingkat II and Statistik Keuangan Desa*).

Employee Compensation

Item B.1 and its components were derived from the corresponding budget categories in the "Personnel Expenditures" (*belanja pegawai*) of the routine and development components of the budget.

Property Income

Government is assumed to have no property income, so item B.2 is zero.

Net Taxes on Production

Government of course receives taxes and pays subsidies. However, the inclusion of these items

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as income components, as explained earlier, is an adjustment to *business income* necessary to make total income equal to GDP expenditures at market prices. For the government sector, therefore, item B.3 is zero.

Consumption of Fixed Capital

This item (B4) was derived from the IO table, row 203 (*penyusutan*) and columns 161 (*jasa pemerintahan umum*), 162 (*jasa pendidikan pemerintahan*), 163 (*jasa kesehatan pemerintahan*) and 164 (*jasa pemerintahan lainnya*).

Mixed Income

By definition, the government has no mixed income, so item B5 is zero.

GDP

This item (B.6) is calculated as the sum of all items in column B.

3. Public Enterprises

This sector includes all enterprises over which the government (represented by the Ministry of Finance or other ministries such as Oil and Mining, Industry and Trade) has actual control, and which cover a substantial portion of their costs through charges for the goods and services they provide. This covers enterprises fully owned by the government (e.g. Pertamina) as well as those partially owned. They are referred to in Indonesian as BUMN (*Badan Usaha Milik Negara*). All items under column C were derived from the annual financial statements reported by these enterprises to the Ministry of Finance and provided to BPS in its annual survey of these enterprises (*Survei BUMN*). The latest available data were for 1999.⁷ The 2000 estimates used the projected 1999-2000 trend in a special report on "Trend of Productivity of Government Enterprises: 1997-2001" produced by the Ministry of Finance.

The column entries are then summed up to provide the total GDP for the column (item C.6).⁸

4. Private Non-Financial Corporations

This sector covers private enterprises in all sectors of the economy other than finance. However, it does not include enterprises under the direct control of households, such as family farms or domestic service. Income of these enterprises is included in the household sector.

⁷ The 1999 survey included 155 out of a total of 177 such enterprises. In 2000 there were 188 enterprises.

⁸ Mixed income for these enterprises (item C5) is assumed to be zero.

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All categories in the non-financial corporations sector (items D.1 - D.6) are calculated as row residuals.

5. Households

Conceptually, this sector is supposed to cover all households engaged in a production activity of goods and services for sale as well as for own consumption. This is supposed to include all of what is often referred to as “informal” sector activities in agriculture, quarrying, manufacturing, construction, trade, transportation and other services. Given the lack of data measuring directly these various activities, we have relied on several sources used within BPS for compiling the Household Sector Account used in constructing the Social Accounting Matrix (SAM), which forces consistency among various production and institutional accounts.

Compilation of the Household Sector Account involves the construction of three T-accounts:

- **the household production account:** this reconciles household credits (from production) on one side and debits on the other (including cost of production, depreciation and mixed income—the latter being a residual)
- **the household income and outlay account:** this also reconciles household credits (wages, mixed income, transfers in) and debits (final consumption, transfers out and savings—the latter being a residual)
- **the household accumulation account:** this also reconciles household credits (savings, depreciation and net capital transfer—the latter being a residual) and debits (change in stock, capital formation and net borrowing).

Building such accounts is very time-consuming and involves using data from many different sources with varying degrees of quality and frequency. This report will not attempt to document this process. Suffice it to say that the outcome of this exercise is a consistent set of accounts which describes the behavior of households as an institutional sector. Three items in column E of Table 1 rely on these calculations: items E.2, E.4 and E.5. Total GDP attributed to the household sector (item E6) is then calculated as the sum of these three entries. In addition, supplementary tables involved in constructing the household accounts yield estimates of two other items, as noted below: total employee compensation (F1) and total property income (F2).

6. Total

Employee Compensation

Item F1 is obtained from the Income and Outlay T-account of the Household Sector Account. The

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main data source was a survey conducted intermittently since 1990 called *Survei Khusus Tabungan dan Investasi Rumah Tangga* (SKTIR). This survey, which covers a sub-sample of households in the much larger socio-economic survey (Susenas),⁹ asks households to provide a detailed breakdown of what amounts to their financial statements (profit and loss, balance sheet and funds flow). The aggregate level of compensation provided by this survey was more plausible than that provided by the annual labor force survey Sakernas (see Appendix B for a discussion of differences between the two sources).¹⁰

Property Income

Item F2 is also obtained from the Income and Outlay T-account of the Household Sector Account.

Net Taxes on Production

In our first attempt, this item (F3) was derived from the IO table, row 204 (*pajak tidak langsung*). However, upon comparing resulting shares¹¹ with those of the historical series, this item was recalculated. We took its share in GDP for 2000 as the average share displayed in previous input-output years, which turned out to be 5.6%, instead of the -2.7% derived from the preliminary version of the 2000 IO table.¹²

Consumption of Fixed Capital

This item (F4) was derived from the IO table, row 203 (*penyusutan*). It is probably understated because, as noted for the financial sector, it is based on historical cost rather than replacement cost. Generally, understatement of this component will be matched by overstatement of property income.

⁹ SKTIR has typically covered about 5000 households versus 60,000 for Susenas.

¹⁰ Another important data source covering this component was the 2000 IO table (covering 172 sectors), which has not yet been published by BPS. The relevant row in that table was 201 (*upah dan gaji*). However, the level obtained from the preliminary version of the table was lower than that in the SKTIR. The latter source, in our judgement, is more plausible. Discussions within BPS to reconcile these two sources are currently under way. We believe that the final version of the 2000 IO table will have a level consistent with that of SKTIR.

¹¹ for both this variable and the consequent effect on the residual (mixed income)

¹² Our implicit assumption in doing so is that we believe that the financial figures reported in the documents used in compiling the 2000 IO table under-report the true level for this item by overstating the level of relevant subsidies (e.g. by possibly including those not related to the establishments' production activities), understating the actual taxes collected for the year (e.g. by possibly delaying collection) or both. We believe that this is the best that can be done given the time constraint we had. Our main recommendation to BPS in this regard is to investigate this issue further before the 2000 IO table is finalized. The final results may well confirm that the actual share was -2.7%. However, until a more in-depth investigation confirms it, we believe that our estimate is more plausible.

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Mixed Income

This item (F5) was calculated as a column residual.

GDP

This item (F6) provides the control total of all entries in the table. It was obtained from the IO table, row 209 (*nilai tambah bruto*).

B. Computations for 1990-1999

Given the lack of relevant data sources, computations for 1990-1999 differed from those of 2000 in that no breakdown by institutional sector was done (i.e. by various columns in Table 1).

1. GDP

Annual total GDP was obtained as the sum of benchmarked sub-sectoral production accounts. Annual series for the 43 sub-sectoral accounts were benchmarked to their corresponding levels in the 1990, 1995 and 2000 IO tables.¹³

2. Employee Compensation

In measuring total employee compensation during the 1990-2000 period, we attempted to use results from the large annual labor force survey (Sakernas). However, as stated earlier (and discussed in Appendix B), the levels derived from that survey were not plausible. Our methodology for estimating the annual levels of employee compensation followed two steps:

- First, the 2000 *level* from SKTIR was taken because of its higher plausibility
- Then the annual wage *growth* from Sakernas (between 1990 and 2000) was applied to that level.

3. Property Income

Figures during IO years (whether regular or estimated tables)¹⁴ were obtained

¹³ This was part of a statistical revision of the historical series currently underway in BPS, which will be documented in a forthcoming internal report.

¹⁴ The 1990, 1995 and 2000 IO tables were regular tables based largely on new data. Those of 1993 and 1998 were estimated tables following what BPS refers to as a “modified RAS” method. That is, the coefficients of the previous table were used and applied to new totals then the RAS raking method was applied. When reliable data for particular cells were available, they were used. However, such “modifications” were usually limited.

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from compiled Social Accounting Matrices (SAM). The SAM computes factor income for two broad categories (labor¹⁵ and non-labor) with each in turn divided into different sub-categories. For non-labor income, the two sub-categories are: incorporated and non-incorporated (mainly informal) institutions. The property income component was calculated as the sum of the following items:

- rentals for agricultural land (non-incorporated institutions)¹⁶
- imputed rents for owner occupied dwellings¹⁷
- capital income of private domestic corporations¹⁸
- capital income of government institutions¹⁹
- capital income of foreign corporations²⁰

For years between IO tables, figures were interpolated.

4. Net Taxes on Production

Figures for 1990, 1993, 1995 and 1998 were obtained from the corresponding IO tables. For years in between, figures were interpolated.

5. Consumption of Fixed Capital

Figures for 1990, 1993, 1995 and 1998 were obtained from the corresponding IO tables. For years in between, figures were interpolated.

6. Mixed Income

This was calculated as a residual.

IV. RESULTS

¹⁵ Values for actual paid labor income in the SAMs are the same as those in the corresponding IO tables.

¹⁶ Code 17 (*Usaha tidak berbadan hukum: Tanah, modal pertanian lainnya*)

¹⁷ Code 18 (*Usaha tidak berbadan hukum: Rumah ditempati pemilik*)

¹⁸ Code 21 (*Usaha berbadan hukum: Modal swasta dalam negeri*)

¹⁹ Code 22 (*Usaha berbadan hukum: Modal pemerintah*)

²⁰ Code 23 (*Usaha berbadan hukum: Modal asing*)

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Results of the above computations for Indonesia's GDP by income type for the 1990-2000 period are provided in the following series of tables and graphs: Table 2 and Figure 1 show levels for the main aggregates, Table 3 shows the level of disposable income and Table 4 and Figure 2 show the relative shares of various income components in GDP.

Table 2
Indonesian GDP by Type of Income 1990-2000 at Current Market Prices (trillion rupiah)

Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Employee Compensation	68	83	98	128	156	187	219	269	298	373	470
Property Income	71	80	91	103	130	163	229	321	450	459	469
Mixed Income	44	59	76	89	97	118	93	47	190	185	260
Net Taxes on Production	12	15	18	22	27	32	37	43	50	83	78
Consumption of Fixed Capital	15	18	22	25	33	43	54	68	85	97	109
GDP	211	256	305	368	443	543	633	748	1072	1197	1386

Table 3
Indonesian Disposable Income 1990-2000 at Current Market Prices (trillion rupiah)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
GDP	211	256	305	368	443	543	633	748	1072	1197	1386
Net Factor Income from Abroad	-10	-11	-12	-13	-14	-13	-14	-18	-54	-79	-89
Disposable Income	201	245	292	356	428	529	618	729	1018	1118	1297

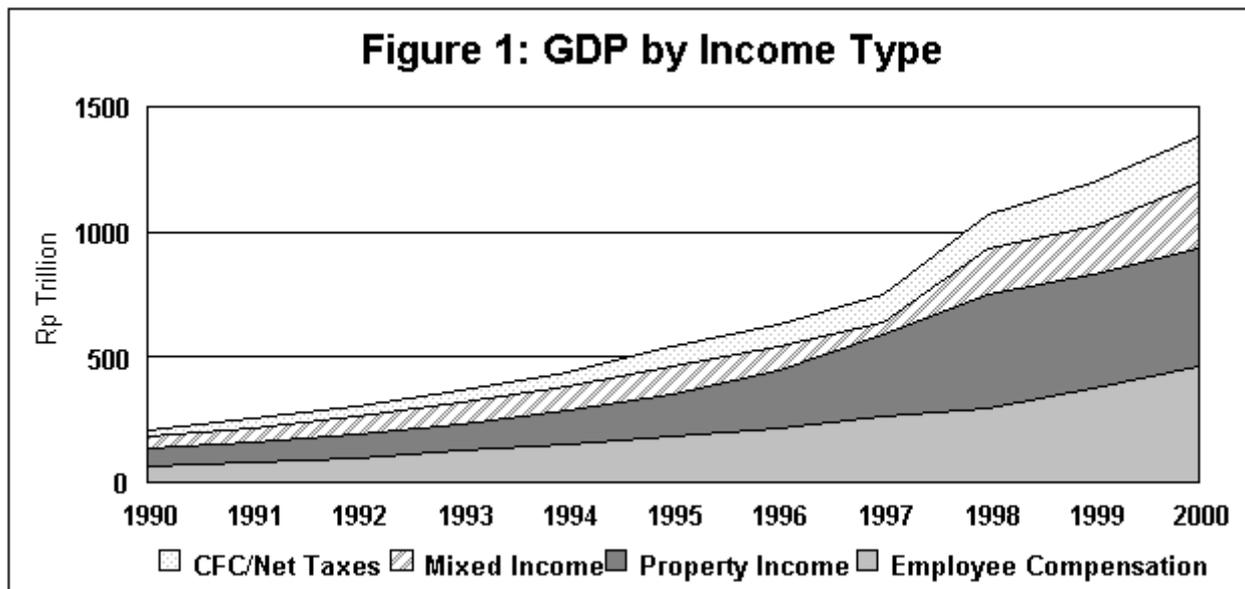
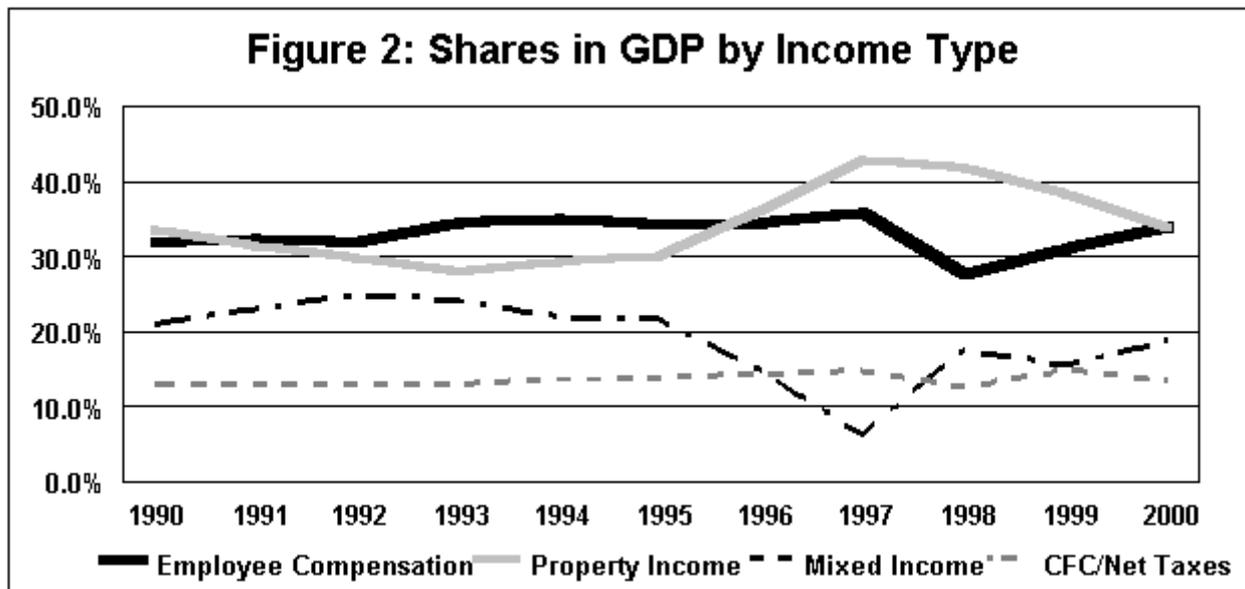


Table 4
Indonesian GDP by Type of Income 1990-2000 at Current Market Prices (percentage shares)

Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Employee Compensation	32.1	32.6	32.1	34.9	35.2	34.4	34.7	35.9	27.7	31.2	33.9
Property Income	33.7	31.4	29.9	28.0	29.3	30.0	36.2	42.9	41.9	38.4	33.9
Mixed Income	21.1	23.0	25.0	24.2	22.0	21.7	14.7	6.3	17.7	15.5	18.7
Net Taxes on Production	5.8	5.9	6.0	6.1	6.0	5.9	5.8	5.7	4.7	6.9	5.6
Consumption of Fixed Capital	7.3	7.1	7.1	6.9	7.5	8.0	8.6	9.1	8.0	8.1	7.9
GDP	100	100	100	100	100	100	100	100	100	100	100



The following observations are worth noting:

- The (combined) contribution of consumption of fixed capital and net indirect taxes has remained more or less the same over time at about 13-15%
- The share of employee compensation has also remained more or less the same over the period (around 32%-35%). The only exception was 1998, which showed a decline of over eight percentage points that was quickly restored to the historical norm in the following years.

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- The behavior of property income was different: starting with roughly the same share as employee compensation in 1990, that share declined slightly through 1995, then rose sharply in 1996 and 1997 only to decline gradually to the same share as employee compensation in 2000.
- The behavior of mixed income is a bit problematic and should be interpreted with great caution. As a residual, this variable incorporates the cumulative effect of errors in measuring all other variables. It is thus not advisable to read too much into its behavior.

How do the shares for Indonesia compare with those from other countries? In our attempt to obtain comparative income account shares with various countries, we wanted to do two levels of comparisons: first with other developing countries at more or less the same stage of development as Indonesia (and preferably in the same geographical region); and secondly with other more developed countries with indications of changes in these shares over time (with preferably a time when the structure of their economy would conceivably be closer to that of present day Indonesia). We could not find data on the first category of countries.²¹ As for other developed countries, Tables 5-8 provide selected comparative shares for four such countries: the US, Canada, the Netherlands and Australia.

²¹ The exception was Taiwan, but the only document that was available dates back to 1981. The following table provides these numbers.

Component	1965	1970	1975	1980
Employee Compensation	39.5	41.9	45.9	47.7
Property Income ¹⁾	23.1	25.7	24.8	25.7
Consumption of fixed capital	6.3	6.8	7.0	7.4
Taxes on Production (net of subsidies)	12.8	14.8	14.5	14.7
Other income ²⁾	18.3	10.8	7.8	4.6
GDP	100	100	100	100

1) sum of "income from property", "profit of government enterprises" and "savings of public corporations."

2) "compound income", which includes "income from firms, professionals and other unincorporated enterprises."

Source: Directorate General of Budget, Accounting and Statistics, Executive Yuan, *National Income of the Republic of China*, December, 1981, Tables 1 (pp. 90-91) and 2 (pp. 114-115).

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Table 5
Percentage Shares of GDP by Type of Income in the US

Component	1980	1985	1990	1995	2000
Employee Compensation	59.1	57.6	57.7	56.8	58.3
Consumption of Fixed Capital	12.3	12.3	12.3	12.3	12.5
Taxes on Production (net of subsidies)	7.1	7.3	7.3	7.7	7.3
Other income ¹⁾	21.5	22.8	22.7	23.2	21.9
GDP	100	100	100	100	100

1) computed in this table as a residual.

Source: figures obtained from Tables 1.1., 1.09 and 1.14, Bureau of Economic Analysis.

Table 6
Percentage Shares of GDP by Type of Income in Canada

Component	1980	1985	1990	1995	2000
Employee Compensation	57.0	53.9	55.6	51.6	50.8
Property Income ¹⁾	20.3	19.4	15.9	16.8	18.4
Consumption of fixed capital	12.0	11.7	11.7	12.9	12.7
Taxes on Production (net of subsidies)	9.7	9.9	11.5	13.2	11.0
Other income ²⁾	1.0	5.2	5.3	5.5	7.0
GDP	100	100	100	100	100

1) sum of: "corporate profits before taxes," "government business enterprise profits before taxes," "interest and miscellaneous investment income," and "accrued net income of farm operators from farm production."

2) computed in this table as a residual

Source: figures obtained from Statistics Canada, *National Income and Expenditure Accounts, Annual Estimates* [for various years], Table 1, Catalogues no. 13-201, 13-201-XPB and 13-001. Note that concepts and computations may have changed over the period.

Table 7
Percentage Shares of GDP by Type of Income in the Netherlands

Component	1980	1986	1990	1995	2000
Employee Compensation	58.8	52.9	51.6	50.9	51.1
Consumption of fixed capital	9.6	11.3	15.4	15.1	15.2
Taxes on Production (net of subsidies)	9.5	9.0	8.5	10.2	11.2
Other Income ¹⁾	22.1	26.8	24.5	23.8	22.5
GDP	100	100	100	100	100

1) computed in this table as a residual.

Source: figures since 1990 (in euros) were downloaded from the Statistics Netherlands website. Figures for the prior period (in gld) were obtained from Statistics Netherlands, *National Accounts 1994*, Table M5.

Table 8
Percentage Shares of GDP by Type of Income in Australia

Component	1989-90	1994-95	1999-2000
Employee Compensation ¹⁾	49.2	49.3	48.0
Taxes on Production (net of subsidies)	12.0	12.3	11.6
Other income ²⁾	38.8	38.4	40.3
GDP	100	100	100

1) "wages and salaries and supplements"

2) computed in this table as a residual

Source: figures before 1999-2000 were obtained from W. McLennan, *Measuring Australia's Economy*, Fourth Edition, Australian Bureau of Statistics, 1996. For 1999-2000, they were derived from Australian Bureau of Statistics, *National Income, Expenditure and Product*, March Quarter 2002.

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So overall, we believe that the figures produced in this report for Indonesia are plausible.

What next? The methodology described in this report provides a good starting point for computation of annual income accounts for Indonesia. Our recommended course of action is for BPS to evaluate these figures and disseminate them to users for their feedback. Annual updates of these accounts can be produced with existing data sources by following the same methodology documented in this report. In cases where data sources used for annual updates are weak, BPS may want to develop new sources which will provide more reliable numbers. The focus, however, should remain on producing these accounts annually, since this is the coverage of the underlying basic data sources. Temptations to produce quarterly accounts should be resisted at least until enough confidence has been built in the annual accounts by having them produced regularly over several years.

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APPENDIX A

INCOME ACCOUNTS FOR 2000 BY INSTITUTIONAL SECTOR

As mentioned in Section III, computation of income accounts for 2000 was done by institutional sector. Table A.1 presents these results.

Table A.1
GDP in 2000 by Income and Sector at Current Market Prices
(trillion rupiah)

Income Type	Financial Sector	Government	Public Enterprises	Private Non-Financial Corporations	Households	Total
1. Employee Compensation	14.11	66.15	13.34	376.63		470
2. Property Income	18.78		37.04	386.28	27.06	469
3. Mixed Income				149.46	110.18	260
4. Net taxes on production	0.43		0.03	77.16		78
5. Cons. of fixed capital	1.57	3.31	28.72	64.89	10.80	109
6. GDP	34.9	69.5	79.1	1054.4	148.0	1386

We attempted a further breakdown (by institutional sector) of:

- Employee compensation into three components: wages and salaries, fringes and income in kind
- Property income into five components: profits, interest, dividends, royalties and rentals.

However, available data at the time of writeup of this report did not permit coverage of enough cells in the matrix to enable production of consistent and plausible figures. Serious gaps remained which required further investigation before figures could be adopted.

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APPENDIX B

EMPLOYEE COMPENSATION USING SAKERNAS

As mentioned in Section III.A, in measuring total employee compensation we attempted to use results from the large annual labor force survey (Sakernas). However, the levels derived from that survey were less plausible than those obtained from the source we finally settled on, the SKTIR.²² Table B.1 provides the basic historical data obtained from Sakernas.

Table B.1
Employment and Nominal Wages Derived from Sakernas

Description	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Employment											
Level (000)	21077	22374	23023	24457	27063	28008	28952	30489	28806	29384	29498
Growth (%)		6.2	2.9	6.2	10.7	3.5	3.4	5.3	-5.5	2.0	0.4
Annual Wages											
Level (trillion Rp)	22.2	27.3	32.0	42.1	51.1	61.2	72.0	88.1	97.6	122.3	154.2
Growth (%)		22.9	17.4	31.5	21.2	19.9	17.6	22.4	10.8	25.4	26.0

Sources: various years' issues of two BPS publications, employment figures were derived from *Labor Force Situation in Indonesia*, and wage figures were based on data in *Laborers/Employees Situation in Indonesia*.

A wage bill of 154 trillion rupiah in 2000 is highly implausible, as it indicates a share of this variable in GDP of only 11%, particularly when compared with the more plausible 34% obtained from SKTIR. The same applies to other years as well. Why are Sakernas levels consistently lower than expected? Some possible reasons may include:

- coverage: by following the standard labor force approach, Sakernas is limited to covering only persons aged 15 years and older, and reporting wages for only those that were employed in the week prior to enumeration, which took place in August in the past few years. SKTIR, on the other hand, includes any household member who had been paid a wage in the previous year. Thus, wages for household members younger than 15 who had worked for pay, and for those who had worked during the year but not during the week prior to enumeration, would be included in

²²

One needs to keep in mind that SKTIR is not a labor force survey. It was not designed to measure aggregate employee compensation in the economy according to the standard labor force approach, but rather to provide a breakdown of household saving and investment. The aggregate level of employee compensation in that survey, which we used for 2000, was computed by multiplying the average ratio of compensation to final consumption (derived from the household Income and Outlay T-account constructed from data obtained from respondents to the survey) and the level of household final consumption expenditure in the IO table. For non-IO years, SKTIR applies the average ratio for a particular year to the level of final consumption expenditure in the GDP.

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Toward Income Accounts for Indonesia

SKTIR but not in Sakernas.

- period: Sakernas asks for wages paid to the individual during the month prior to enumeration, which covers July in the past years.²³ SKTIR asks individuals to report any wages paid during the previous year. Thus if reported wages in July were not typical of those earned during the year, figures from the two sources may differ.
- activity: Sakernas asks for wages only from the “primary activity,” whereas SKTIR enquires about wages from all activities. The true wage level of households engaging in multiple activities would thus be under-reported in Sakernas.
- net vs gross: Sakernas asks for wages after taxes (and other compulsory deductible fees), whereas SKTIR asks for gross wages before taxes.

All these reasons may have contributed to producing what we believe is an implausibly low level for wages and salaries for the nation as a whole in Sakernas. There may well be other more important factors at play. Measurement of the magnitude of these (or other) factors is beyond the scope of the present paper. The methodology that we finally adopted for estimating the annual levels of employee compensation followed two steps:

- First, the 2000 *level* from SKTIR was taken because of its higher plausibility
- Then the annual wage *growth* from Sakernas was applied to that level. We believe that while the aggregate level of wages derived from Sakernas may have been under-estimated, annual growth in wages is highly plausible given that Sakernas was designed to provide an adequate measure of growth from year to year.

²³

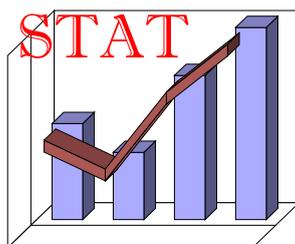
Annual wage figures in Table B.1 are based on published monthly numbers.

IS SUSENAS RICE CONSUMPTION IN URBAN AREAS OF INDONESIA UNDERSTATED?

Report # 64
Statistical Paper # 15

by
Yahya Jammal
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Is Susenas Rice Consumption in Urban Areas Understated?

I. INTRODUCTION

Rice consumption in Susenas, the regular national socio-economic survey conducted by BPS, is understated. This appears to represent conventional wisdom in Indonesia at the present time. Discussions with knowledgeable people within as well as outside BPS seem to confirm the prevalence of this belief. People have tended to take that conclusion for granted and have concentrated their efforts on trying to explain the reasons for the understatement.

In an earlier paper,¹ Sastrotaruno and Maksum attempted to compare annual levels of aggregate rice consumption and production in Indonesia over the past three decades and argued that the substantial difference between the two was more due to an overstatement of production than an understatement of consumption (which relies primarily on Susenas). The present paper attempts to test the claim of understatement in Susenas by comparing its results with those of another more reliable source. More specifically, the paper attempts to test the following hypothesis:

Is the Susenas per capita rice consumption level in urban areas of Indonesia underestimated?

To do that, results from the 1996 Susenas consumption expenditure survey were compared with those obtained from the larger and more complete 1996 Cost of Living Survey (*Survei Biaya Hidup*, SBH). Given that the SBH coverage was limited to 44 cities, the hypothesis had to be limited to relevant urban areas. Following a discussion of coverage, design and contents of the two surveys (in Section II), and the methodology we applied for comparing results from these surveys (Section III), results are provided in Section IV. The very brief answer to the question that we are addressing is this: Susenas rice consumption in urban areas in 1996 is NOT understated.

II. DATA SOURCES

A. Susenas

1. Purpose & Coverage

Susenas is a multi-purpose survey which has been conducted regularly since the 1960s and has constituted the primary source for data on socio-economic characteristics of the population in Indonesia. Its frequency, coverage and questionnaires have undertaken several changes over time. Since the 1990s it has been divided into two major undertakings: an annual

¹ Sastrotaruno, Suwandhi and Choiril Maksum, *Aggregate Rice Data in Indonesia: A Brief Overview*, STAT Project Report #48, February, 2002.

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core survey designed to track developments in major household characteristics and a tri-annual *module* designed to measure in more detail specific household characteristics. Three *module* surveys have been conducted in the past decade:

- one on household income and expenditure,
- one on culture, criminality, tourism and welfare and
- one on health, education and housing

While the sample for the *core* survey has covered about 200,000 households in order to enable adequate representation at the kabupaten level, that of the *modules* has included only about 65,000 since only representation at the provincial level was sought. In order to spread workload more evenly, each module has been conducted once every three years. Thus, in any one year two surveys have been conducted at the same time: the *core* survey and one of the *modules*.

The relevant survey for this report is the 1996 *module* on household income and expenditure. It covered 65,664 households in all 27 provinces of Indonesia at the time (with 27,008 identified in urban areas and 38,656 in rural areas). In the sections that follow, this will be the survey in question whenever any reference to the “1996 Susenas” is made.

2. Questionnaire

The 1996 Susenas survey, which was conducted during the month of February 1996, required an interview between a BPS enumerator (the *mantri statistik*) and the head of the household.² During the interview, the enumerator would ask questions as stated in the questionnaire and would record the answers. With regard to food consumption, the household was asked to provide answers to a question which translates roughly into: “how much did your household consume during the past week?” The household was then provided with a list of over 200 commodities and was required to provide the following data by individual commodity:

- Purchases: quantity (units varied) and value (in rupiah)
- Own production: quantity (units varied) and value (in rupiah)
- Total (of the above two): quantity and value.

Appendix D provides an abbreviated version of the questionnaire containing questions on household characteristics and those on rice consumption. The list of rice commodities is provided in Table 1 below. No other question contained relevant information on rice consumption *per se*,

² If the head of household was not present at the time of the interview, then any adult household member (excluding servants) who is knowledgeable about household consumption could answer.

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which could be used in the comparison with data from the SBH.³

In sum, data from the 1996 Susenas survey covered rice consumption in one week of February 1996 and was based on the response of the interviewee, which in turn relied on the interviewee's memory, not on a daily diary.

B. Cost of Living Survey

1. Purpose

The Cost of Living Survey (*Survei Biaya Hidup*, SBH) is a survey of household expenditure conducted for the sole purpose of providing the basket of commodities as well as commodity weights used in computing the Consumer Price Index (CPI) for particular cities in Indonesia. Since the 1970s, it was conducted only three times: once in 1977/78 in 17 provincial capital cities, once in 1989 in 27 provincial capital cities and finally in 1996 in 44 cities (27 provincial capitals and 17 district capitals/municipalities).

2. Coverage

Unlike Susenas, which aims at providing comprehensive national coverage, the SBH is designed to provide adequate coverage of household expenditure for each city separately. In other words, the SBH was not designed for representation of the national expenditure pattern, but rather for representation of the expenditure pattern of individual cities. The 1996 survey, which is the subject of investigation of this report, covered 60,360 households in 44 cities, with samples ranging from 336 households in Dili (East Timor) to 4,800 in DKI Jakarta.

Unlike the 1996 Susenas, which covered households of all sizes and characteristics, the SBH was supposed to cover only "literate" households with 2-10 members.⁴ Household literacy, which was defined as having at least one household member aged 15 years or older able to read and write, was necessary since the household was expected to fill particular forms. Household size was limited to 2-10 members for practical operational reasons. In reality, however,

³ Only two further questions contained some reference to rice:

- the first was what appears to be a summary measure of the "average monthly household expenditure (in rupiah)" but which also stated "during one week." Despite the uncertain meaning of this variable, it is not relevant to our investigation since it is limited to the category "padi-padian" which includes several non-rice commodities and excludes prepared rice.
- the other enquired about the "frequency of rice consumption" by individual household member. This was a supplementary question designed, according to those familiar with various stages of this survey's design, to provide data on food consumption habits of household members. It was not designed to be incorporated into the computation of the level of household consumption.

⁴ These were the conditions stipulated in the operational manual (*Pedoman Pencacah, Pengawas/Pemeriksa Rumah Tangga Sampel*, Buku 5, *Survei Biaya Hidup* 1996, p. 3).

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households of all sizes were included in the survey⁵ and the literacy requirement was not very relevant as most urban households in Indonesia contain at least one literate member.⁶ Therefore, one can reasonably assume that both surveys essentially covered the same types of households.

3. Data Collection

The SBH was carried out in two rounds to lessen the effect of seasonality in consumption: one in June 1996 for one-half of the households in the sample and one in December 1996 for the other half. During each round, the enumerator would visit the household four times: the first visit would be to explain the purpose and mechanics of the survey and leave relevant documents with the household; and the other three visits would be to ensure reliability of reported data.

4. Questionnaire

The SBH questionnaire is far more elaborate than that of Susenas. It covers more than 600 food items (vs 200 for Susenas), in addition to the other 800 items covering non-food expenditure. Appendix E provides an abbreviated version of the questionnaire covering questions on household characteristics and those on rice consumption. In terms of rice commodities, the SBH questionnaire allows for ten individual types of raw rice (vs six for Susenas) and sixteen types of prepared rice (vs four for Susenas). Table 1 compares the lists of these commodities between the two surveys.

⁵ Of 59,386 households in the 1996 SBH data set, 249 (0.4%) had only one member and 254 (0.4%) had over ten members.

⁶ The 1996 Susenas *core* survey suggests that 93% of the urban population aged 15 years or older were literate.

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- b. quality/brand,
- c. quantity in standard units,
- d. value of consumption in rupiah and
- e. how the commodity was acquired.

The household was required to provide this information separately for three categories of consumed items: purchases, own produced and "other". It is not clear what the "other" category may include. Results would then be transcribed by the enumerator onto a weekly summary sheet, summed up then the weekly sums would be entered manually into the main questionnaire (shown in Appendix E). Appendices F and G provide samples of the daily diary and the weekly summary sheet respectively.

Although quantity and value data were entered in the questionnaire for each one of the three above categories, only totals for all three categories combined were entered in the computerized data set.

- non-routine expenditure (i.e. non-food) were required to be reported in monthly increments (over the past six months) in a document provided to the household. Like food items, results in this case were transcribed by the enumerator to a summary sheet, summed up over the six-month period then the monthly sums were entered manually into the main questionnaire. Sample forms for these items are not provided in this report because they are not relevant to our analysis.

III. METHODOLOGY & DATA CHECKS

The previous section suggests that, other things being the same, given its more extensive coverage, more elaborate questionnaire and more rigorous reporting requirements, the 1996 SBH is expected to provide a more accurate measurement of household consumption than the 1996 Susenas for the same households. Thus by comparing per capita rice consumption obtained from the 1996 Susenas with that obtained from the SBH, we can determine whether to accept or reject the hypothesis that the Susenas measure understates the true level of rice consumption represented by the SBH.

A. Methodology

Since both surveys are samples, they are both subject to several types of potential errors:

- a. at the household Level:
 1. conceptual errors: e.g. introduction of wrong definitions, or of wrong ways that concepts are put into practice (questionnaire design, interviewer training)
 2. reporting error
 3. processing errors: editing, coding, data entry, programming etc.

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- 4. non-response
 - b. at more aggregated geographic levels (wilcah, kabupaten, province, national): in addition to the above errors, two further estimation errors can be introduced,
 - 1. coverage error: e.g. omissions, wrong boundaries, outdated lists etc.
 - 2. sampling error

Our attempt in this report focused on the impact of the measurement process. That is, to find out whether the expected potential bias in the Susenas results was subject to a larger bias than that of the SBH. In other words, we focused on the effect of all non-sampling measurement errors combined, rather than measure the extent of each error separately.

Since we did not need to measure sampling error, we wanted to minimize its effect. The easiest way to do so was by maximizing the size of the samples compared. That is why our attempt compared results for the whole nation rather than for any particular geographic area.

To do that, the following steps were followed:

- 1) Select comparable jurisdictions: since the SBH covered 44 cities (i.e. urban concentrations), only urban areas containing these cities were selected from the 1996 Susenas. Table 2 compares geographic coverage and households between the two surveys.

Table 2
Geographic Coverage in Comparative Analysis

	Susenas	SBH
Areas	44 urban areas ¹⁾	44 cities ²⁾
Number of households	11,499	59,386
Number of household members	52,760	288,607

1) Urban areas covered included those corresponding to the 44 cities in the SBH.

2) Aceh Utara, Banda Aceh, Tapanuli Selatan, Sibolga, Pematang Siantar, Medan, Padang, Pekan Baru, Batam, Jambi, Palembang, Bengkulu, Bandar Lampung, DKI Jakarta, Tasikmalaya, Serang, Bandung, Cirebon, Purwokerto, Surakarta, Semarang, Tegal, Yogyakarta, Jember, Kediri, Malang, Surabaya, Denpasar, Mataram, Kupang, Dili, Pontianak, Kotawaringin Timur, Palangka Raya, Banjarmasin, Balikpapan, Samarinda, Manado, Palu, Ujung Pandang, Kendari, Maluku Utara, Ambon, Jayapura.

- 2) Make the two samples as similar as possible in terms of two critical characteristics: geographic distribution and household size distribution. To do

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that, the SBH was used as a benchmark given its more extensive coverage. An *iterative proportional fitting* (or *raking*) procedure was then applied to make the distribution of the Susenas sample agree with that of the SBH in terms of the two chosen characteristics.⁷ The steps involved were the following:

- Let

- i be a subscript referring to a particular area (city)
- j a subscript denoting households in the SBH
- k a subscript denoting households in the Susenas sample
- $W_{i,j}^H$ the sample weight of household j in area i covered in the SBH
- $R_{i,j}^H$ the reported amount of rice consumption by household j in area i in the SBH
- R_i^H the weighted rice consumption in area i covered in the SBH

$$R_i^H = \sum_j W_{i,j}^H \cdot R_{i,j}^H$$

- P_i^H the proportion of weighted rice consumption in area i relative to weighted rice consumption in all urban areas covered in the SBH

$$P_i^H = R_i^H / \sum_i R_i^H$$

- $W_{i,k}^S$ the sample weight of household k in area i covered in Susenas
- $R_{i,k}^S$ the reported amount of rice consumption by household k in area i in Susenas
- R_i^S the weighted rice consumption in area i covered in Susenas

$$R_i^S = \sum_k W_{i,k}^S \cdot R_{i,k}^S$$

- P_i^S the proportion of weighted rice consumption in area i relative to weighted rice consumption in all urban areas covered in the Susenas sample:⁸

$$P_i^S = R_i^S / \sum_i R_i^S$$

- Susenas sample weights were redefined as:

$$W_{i,k}'^S = W_{i,k}^S \cdot \left(\frac{P_i^H}{P_i^S} \right)$$

This made the weighted distributions P_i^S by area the same as P_i^H .

- Once the samples were adjusted geographically as above, a similar procedure was applied to adjust their marginal distribution by household size (h).

Let

- $W_{h,j}^H$ be the sample weight of household j of size h in the SBH
- $R_{h,j}^H$ the reported amount of rice consumption by household j of size h in the SBH
- R_h^H the weighted rice consumption of households of size h covered in the SBH

⁷ This procedure and its step-by-step formulations were kindly provided by Dr. Vijay Verma. The general concept is described in more detail in Verma's *Notes on Estimation Procedures*, STAT Project Report #62, October, 2002.

⁸ This was restricted to the 44 urban areas covered in our comparative analysis.

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$$R_h^H = \sum_j W_{h,j}^H \cdot R_{h,j}^H$$

P_h^H the proportion of weighted rice consumption of households of size h relative to weighted rice consumption in all urban areas covered in the SBH

$$P_h^H = R_h^H / \sum_h R_h^H$$

$W_{h,k}^S$ the sample weight of household k of size h covered in Susenas, taking into account the adjustment made by area above

$R_{h,k}^S$ the reported amount of rice consumption by household k of size h in Susenas

R_h^S the weighted rice consumption of households of size h covered in Susenas

$$R_h^S = \sum_k W_{h,k}^S \cdot R_{h,k}^S$$

P_h^S the proportion of weighted rice consumption of households of size h relative to weighted rice consumption in all urban areas covered in the Susenas sample

$$P_h^S = R_h^S / \sum_h R_h^S$$

- Susenas sample weights were redefined as:

$$W_{h,k}^{*S} = W_{h,k}^S \cdot \left(\frac{P_h^H}{P_h^S} \right)$$

This made the weighted distributions P_h^{*S} by household type (which have already been adjusted by area) the same as P_h^H .

- In principle, the above two adjustments in the procedure could be repeated iteratively. However, in the present case, no repetitions were required since the weights converged quickly after a single application.

3) Compare average per capita rice consumption between the two samples.

B. Data Checks

To ensure that the final figures used in this analysis were correct, they were subjected to a number of consistency and plausibility checks.

1. Susenas

For the Susenas figures, the following checks were performed:

- Per capita as well as aggregate numbers in the data set were compared with relevant published figures, for both quantities and values.
- Per capita quantity and value figures for included urban areas were

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compared with those of all urban areas and with those of all areas (urban and rural) for plausibility.

- Per capita unit values for different types of commodities and commodity groups were compared with relevant price measures from other surveys for plausibility.
- Weighted and unweighted figures were compared to determine the plausibility of the effect of using design weights.
- Results of using reweighted vs unweighted figures were compared to check the plausibility of the effect of reweighting for comparing Susenas with SBH

2. SBH

For the SBH, the following checks were performed:

- Per capita numbers by city in the data set (for the 14 cities in Java) were compared with relevant published figures, for both quantities and values.⁹
- Per capita unit values for different types of commodities and commodity groups by city were compared with relevant price measures from other surveys for plausibility.
- Weighted and unweighted figures by city were compared to determine the plausibility of the effect of using design weights

IV. RESULTS & CONCLUSIONS

Based on the above methodology, an average per capita rice consumption per week for 1996 was computed using both Susenas and the SBH. Table 3 compares its main components.

⁹ Exact published figures could not be replicated for either quantities or values. However, the levels obtained from our data set were close enough to indicate that we were using the same data as in the publication.

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Table 3
Average per Capita Rice Consumption Per Week in 1996: Susenas vs SBH

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	2.098	1.673	1.254
Value (Rp)	1995	1731	1.153
Prepared Rice Purchased			
Quantity (portion) ¹⁾	0.534	1.068	0.500
Value (Rp)	426	804	0.530
Own Produced Rice (raw +			
Quantity ²⁾	0.135	na	
Value (Rp)	126	na	
Total Rice Consumed			
Value (Rp)	2548	2535	1.005

- 1) this measure is not meaningful as “portion” may not be uniform
- 2) this measure is not meaningful as “raw” is measured in kg but “prepared” is measured in “portion”. It is provided here simply to illustrate that its magnitude is relatively small, even when all units are added up.

The table points to a number of important observations:

- First, it shows that the largest proportion (over two-thirds) of the total value of rice consumption of an individual consumer is in the form of raw rice purchased, whether one uses Susenas or the SBH. The proportion of rice produced and consumed within the household, which is only available in Susenas, is minuscule (less than 1% of the total value of rice consumed).
- If one compares per capita consumption of purchased raw rice between the two surveys, the figure from Susenas is significantly higher than that from the SBH (25% higher in terms of quantity and 15% higher in terms of value).
- If one compares total per capita rice consumption (i.e. from all sources), then the values from the two surveys are virtually identical. The difference in values of the raw rice consumption is compensated by the opposite difference for prepared rice consumption. This may be due to possible social differences in respondents (a point noted later) or to possible differences in interpretation of the questions between the two surveys. Such comparison, however, can only be made in terms of rupiah value. Total per capita quantity consumed cannot be computed since prepared rice is measured in non-uniform units (“portion”).

If we had to stop here it would be unfortunate because our finding with regard to whether Susenas understates rice consumption would not be conclusive. Although discussions with knowledgeable

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people in this area suggest that purchased raw rice is by far the most important source of rice consumption, implying that a strong conclusion regarding this component would most probably apply to the total as well, we felt that it would be more desirable if we could quantify such proportions in order to arrive at a single comparative measure. Luckily, an earlier BPS survey conducted in 1990-1991 attempted to do that: to measure the reliability of per capita consumption of food items in the 1990 Susenas, it surveyed over 2000 households all over Indonesia (in both urban and rural areas) and required them to measure both raw and prepared foods in kilograms. Appendix C discusses briefly the findings of that survey as they relate to rice consumption in urban areas. Results of that survey were useful in two respects:

- By measuring all units of rice consumption in kilograms, it confirmed that over 90% of the quantity of rice consumed in urban areas is indeed in the form of raw rice (Table C.2).
- It provided us with a useful set of proportions of quantities of prepared rice to raw rice consumed for different categories of rice (“domestic + special + imported,” “glutinous,” “rice meal” and “rice noodles”, see Table C.2).

By applying the average shares (in urban areas) obtained from that survey to the quantities of individual raw rice commodities reported in the 1996 Susenas and the 1996 SBH (categories “prepared rice purchased” and “prepared own produced rice” in Table 3), we were able to compute quantity (in addition to the already reported value) measures for the three broad groups of commodities in Table 3. Table 4 shows results of these computations.

Table 4
Average per Capita Rice Consumption Per Week in 1996: Susenas vs SBH
(Using same proportions of prepared to raw as in 1990-91 special survey)

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	2.098	1.673	1.254
Value (Rp)	1995	1731	1.153
Prepared Rice Purchased			
Quantity (kg)	0.136	0.115	1.177
Value (Rp)	426	804	0.530
Own Produced Rice (raw +			
Quantity (kg)	0.036	na	
Value (Rp)	126	na	
Total Rice Consumed			
Quantity (kg)	2.270	1.788	1.269
Value (Rp)	2548	2535	1.005

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In addition to the above conclusions based on Table 3, Table 4 suggests one more: in terms of the quantity of total rice consumed, the average per capita level based on Susenas is significantly higher than that in the SBH (27%). That was despite the fact that the value of per capita consumption of prepared rice in Susenas was only 53% of that obtained from the SBH.¹⁰

Thus, overall, our finding was that **average rice consumption derived from the 1996 Susenas is NOT lower than that derived from the 1996 SBH**. How robust is that conclusion? In other words, is it possible that the final figures reported in Tables 3 and 4 were substantially altered by our weighting procedure discussed in Section III.A? The answer to the latter question is: no. Appendix A provides figures comparable to those in Tables 3 and 4 but using (less statistically reliable) unweighted numbers. The conclusions from the relevant tables (A.1 and A.2) remain the same as those derived from Tables 3 and 4: per capita consumption of raw rice derived from Susenas is significantly higher than that in the SBH for both value and quantity; and when all items are converted into kilograms, per capita quantity of rice consumed in Susenas is significantly higher than that in the SBH while the per capita value of consumption between the two surveys is close (probably within the range of sampling error).

Tables B.1 and B.2 in Appendix B further provide data for DKI, the only fully comparable domain of estimation between the two surveys. Again, the conclusion that the quantity of rice consumed in Susenas is higher than that in the SBH remains valid, although in this case the value of rice consumption in Susenas is significantly lower than that in the SBH. These two findings can certainly be reconciled by the fact that Susenas respondents in DKI tend to be among lower income households than those covered in the SBH.¹¹

Overall then, **the answer to the hypothesis that we are testing in this paper (“is the per capita rice consumption level derived from Susenas in urban areas of Indonesia understated?”) is a conclusive and solid NO.**

¹⁰ The two observations (that quantity of prepared rice in Susenas was higher than that in the SBH while value was lower) can be reconciled if one believes that Susenas respondents generally covered cheaper varieties of such food than those in the SBH.

¹¹ The average monthly household consumption expenditure in DKI in the 1996 Susenas was Rp. 736,400 while that in the 1996 SBH was Rp. 1,131,569.

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APPENDIX A**TABULATIONS USING UNWEIGHTED DATA**

This appendix provides results comparable to those in Tables 3 and 4 above, but using unweighted data.

Table A.1
Average per Capita Rice Consumption Per Week in 1996: Susenas vs SBH
(Using unweighted data)

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	1.864	1.619	1.151
Value (Rp)	1887	1708	1.105
Prepared Rice Purchased			
Quantity (portion) ¹⁾	0.608	1.140	0.533
Value (Rp)	568	947	0.599
Own Produced Rice (raw +			
Quantity ²⁾	0.122	na	
Value (Rp)	111	na	
Total Rice Consumed			
Value (Rp)	2566	2656	0.966

- 1) this measure is not meaningful as "portion" may not be uniform
- 2) this measure is not meaningful as "raw" is measured in kg but "prepared" is measured in "portion". It is provided here simply to illustrate that its magnitude is relatively small, even when all units are added up.

Table A.2
Average per Capita Rice Consumption Per Week in 1996: Susenas vs SBH
(Using same proportions of prepared to raw as in 1990-91 special survey)

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	1.864	1.619	1.151
Value (Rp)	1887	1708	1.105
Prepared Rice Purchased			
Quantity (kg)	0.124	0.112	1.109
Value (Rp)	568	947	0.599
Own Produced Rice (raw +			
Quantity (kg)	0.038	na	
Value (Rp)	111	na	
Total Rice Consumed			
Quantity (kg)	2.027	1.731	1.171
Value (Rp)	2566	2656	0.966

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Is Susenas Rice Consumption in Urban Areas Understated?

APPENDIX B

TABULATIONS FOR DKI JAKARTA

This appendix provides results comparable to those in Tables 3 and 4 above, using both properly weighted and unweighted data but limited to DKI Jakarta.

Table B.1
Average per Capita Rice Consumption Per Week in 1996 in DKI (unweighted): Susenas vs SBH

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	1.742	1.463	1.191
Value (Rp)	1812	1698	1.067
Prepared Rice Purchased			
Quantity (portion) ¹⁾	0.119	2.067	0.058
Value (Rp)	983	2137	0.460
Own Produced Rice (raw +			
Quantity ²⁾	0.124		
Value (Rp)	99		
Total Rice Consumed			
Value (Rp)	2894	3835	0.754

- 1) this measure is not meaningful as "portion" may not be uniform
- 2) this measure is not meaningful as "raw" is measured in kg but "prepared" is measured in "portion". It is provided here simply to illustrate that its magnitude is relatively small, even when all units are added up.

Table B.2
Average per Capita Rice Consumption Per Week in 1996 in DKI (unweighted): Susenas vs SBH
(using same proportions of prepared to raw as in 1990-91 special survey)

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	1.742	1.463	1.191
Value (Rp)	1812	1698	1.067
Prepared Rice Purchased			
Quantity (kg)	0.000	0.102	0.004
Value (Rp)	983	2137	0.460
Own Produced Rice (raw +			
Quantity (kg)	0.005	na	
Value (Rp)	99	na	
Total Rice Consumed			
Quantity (kg)	1.748	1.564	1.117
Value (Rp)	2894	3835	0.754

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Table B.3
Average per Capita Rice Consumption Per Week in 1996 in DKI (weighted): Susenas vs SBH

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	1.728	1.463	1.181
Value (Rp)	1771	1698	1.043
Prepared Rice Purchased			
Quantity (portion) ¹⁾	0.911	2.067	0.441
Value (Rp)	1013	2137	0.474
Own Produced Rice (raw +			
Quantity ²⁾	0.130		
Value (Rp)	110		
Total Rice Consumed			
Value (Rp)	2894	3835	0.755

- 1) this measure is not meaningful as "portion" may not be uniform
- 2) this measure is not meaningful as "raw" is measured in kg but "prepared" is measured in "portion". It is provided here simply to illustrate that its magnitude is relatively small, even when all units are added up.

Table B.4
Average per Capita Rice Consumption Per Week in 1996 in DKI (weighted): Susenas vs SBH
(using same proportions of prepared to raw as in 1990-91 special survey)

	Susenas	SBH	Susenas/SBH
Raw Rice Purchased			
Quantity (kg)	1.728	1.463	1.181
Value (Rp)	1771	1698	1.043
Prepared Rice Purchased			
Quantity (kg)	0.118	0.102	1.165
Value (Rp)	1013	2137	0.474
Own Produced Rice (raw +			
Quantity (kg)	0.004	na	
Value (Rp)	110	na	
Total Rice Consumed			
Quantity (kg)	1.851	1.564	1.183
Value (Rp)	2894	3835	0.755

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APPENDIX C

RESULTS OF A 1990-91 SPECIAL SURVEY

This survey¹² was conducted in 1990-1991 in five quarterly rounds between Quarter 1 1990 and Quarter 1 1991 to measure the average per capita consumption of various food items, including different categories of rice. It covered a sample of 2120 households in urban and rural areas of 27 provinces. The notable procedure used in this survey was the direct measurement in kilograms of various portions of raw and prepared foods and the use of a diary by households for more reliable recording of item consumption. Thus the study allows comparison of quantities of raw food and prepared foods, unlike Susenas and SBH, both of which use the non-uniform “portion” as the unit of measurement of prepared foods (including rice).

For the purpose of the present paper, two important results were derived: the first comparing average quantity of rice consumed with that reported in the 1990 Susenas (Table C.1), and the other providing a useful breakdown of the quantity of rice consumed (including prepared rice), as in Table C.2.

Table C.1
Average per Capita Weekly Rice Consumption (in kg): 1990-91 Special Survey vs 1990 Susenas

	Susenas 1990 ¹⁾			Special Survey ²⁾			Special Survey Statistics		
	Raw	Prepared	Total	Raw	Prepared	Total	cv	Lower limit (raw)	Upper limit (raw)
Domestic+special+ imported	2.136	na	2.136	2.055	0.149	2.204	2.1%	2.013	2.097
Glutinous	0	na	0	0.010	0.014	0.024	30.1%	0.01	0.013
Rice meal	0	na	0	0.01	0.015	0.024	21.0%	0.01	0.011
Rice noodles		na	0			0			
Total	2.148	na	2.148	2.074	0.178	2.252			

- 1) conducted in February 1990. Results refer to urban areas in 27 provinces. Relative standard errors for variables in the table were not readily available.
- 2) Round 1, conducted January-March 1990. Results refer to urban areas in 27 provinces.

¹² The writeup and figures in this appendix were extracted from two documents: *Studi Reliabilitas/SKM (Lanjutan) Laporan Akhir*, BPS, June 1992 and *Reliability Study/SKM (Continued) Executive Summary*, BPS, June 1992.

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Table C.2
Average per Capita Weekly Rice Consumption (in kg) Over 5 Rounds of the 1990-91 Special Survey

	Kilogram			Horizontal Shares			Vertical Shares		
	Raw	Prepared	Total	Raw	Prepared	Total	Raw	Prepared	Total
Domestic+ special+ imported	1.952	0.132	2.084	93.7%	6.3%	100%	99.0%	80.3%	97.5%
Glutinous	0.009	0.013	0.022	41.9%	58.1%	100%	0.5%	7.7%	1.0%
Rice meal	0.008	0.017	0.025	31.4%	68.6%	100%	0.4%	10.3%	1.1%
Rice noodles	0.004	0.003	0.006	55.6%	44.4%	100%	0.2%	1.7%	0.3%
Total	1.973	0.164	2.136	92.3%	7.7%	100%	100%	100%	100%

Note: the survey was conducted in five quarterly rounds between January 1990 and March 1991 covering 27 provinces. Results in the table refer only to urban areas surveyed.

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APPENDIX D
SAMPLE QUESTIONNAIRE: 1996 SUSENAS

This appendix provides only relevant parts of the Susenas questionnaire: the household characteristics section and that covering rice consumption.

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Is Susenas Rice Consumption in Urban Areas Understated?

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APPENDIX E
SAMPLE QUESTIONNAIRE: 1996 SBH

This appendix provides only relevant parts of the 1996 SBH questionnaire: the household characteristics section and that covering rice consumption.

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SBH 96
SURVEI BIAYA HIDUP

REPUBLIK INDONESIA
BIRO PUSAT STATISTIK

RAHASIA

38/196-9

SURVEI BIAYA HIDUP 1996

KETERANGAN RUMAHTANGGA, KONDISI BANGUNAN, FASILITAS TEMPAT TINGGAL,
PENGELUARAN DAN PENDAPATAN/PENERIMAAN RUMAHTANGGA

I. PENGENALAN TEMPAT, KETERANGAN RUMAHTANGGA DAN PETUGAS			
I.1. PENGENALAN TEMPAT			
1. Propinsi		2	<input type="text"/>
2. Kabupaten/Kotamadya *)		4	<input type="text"/>
3. Kota/Kota Administratif *)			
4. Kecamatan			
5. Kelurahan/Desa			
6. Nomor Wilayah Pencacahan			
7. Nomor Kelompok Segmen			
8. Nomor Kode Sampel		6	<input type="text"/>
9. Nomor Urut Sampel		12	<input type="text"/>
10. Nomor Golongan Rata-rata Pengeluaran Sebulan		14	<input type="text"/>
11. Nomor Urut Rumah tangga Terpilih			
I.2. KETERANGAN RUMAHTANGGA			
1. Nama Kepala Rumah tangga		15	<input type="text"/>
2. Jumlah Anggota Rumah tangga		19	<input type="text"/>
3. Jumlah Anggota Rumah tangga Ekonomi		21	<input type="text"/>
4. Jumlah Anggota Rumah tangga Lainnya		23	<input type="text"/>
5. Jumlah Anggota Rumah tangga Ekonomi Yang Bekerja		24	<input type="text"/>
6a. Tempat biasa berbelanja makanan, minuman, rokok & tembakau		26	<input type="text"/>
6b. Tempat biasa berbelanja bukan makanan, minuman, rokok & tembakau		27	<input type="text"/>
I.3. KETERANGAN PETUGAS			
URAIAN	PENCACAH	PENGAWAS	EDITOR
1. Nama			
2. Tanggal/Tanda Tangan			
3. NIP/NMS *)			

*) Coret yang tidak sesuai

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VI. MAKANAN JADI, MINUMAN,		Rokok dan Tembakau					
Kode	Jenis barang	Kualitas/ Merk	Satuan Standar	Produksi / Konsumsi		Jumlah Konsumsi	
				Banyaknya (0.00)	Nilai (Rp.)	Banyaknya (0.00)	Nilai (Rp.)
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
JADI							
15	0	6	0	1			
VI.1. MAKANAN							
3 0	Ubi goreng		DJ				
3 1	Jagung		Bj				
3 2	Agar - agar		DJ				
3 3	Lapis		Bj				
3 4	Pisang goreng		Bj				
3 5	Ubi		DJ				
3 6	Singkong goreng		Bj				
3 7	Bakpao		DJ				
3 8	Tape goreng		Bj				
3 9	Oacar		Bj				
4 0	Gerek goreng		DJ				
4 1	Getak lalri		Bj				
4 2	Emping		Bgulas				
4 3	Keripik		Bgulas				
4 4	Kerupuk		Bgulas				
4 5	Eating kacang		Bgulas				
4 6	Popcorn (Breading)		Bgulas				
4 7	Kembang gula		Bgulas				
4 8	Tao, chiti dan sejenisnya		Bgulas				
4 9	Kerupuk ikan		Bgulas				
5 0	Kerupuk udang		Bgulas				
5 1	Kerupuk Plerabang		Bgulas				
5 2	Kerupuk Cerdar		Bgulas				
5 3	Kerupuk Kidi / Terbuk		Bgulas				
5 4	Tape ketan		Bgulas				
5 5	Tape ladan		Bgulas				
5 6	Banyaknya		Bgulas				
5 7	Solan goreng		Bj				
5 8	Micin		Bgulas/ton				

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APPENDIX F

SAMPLE DIARY FOR FOOD ITEMS: 1996 SBH



Republik Indonesia
Biro Pusat Statistik

SURVEI BIAYA HIDUP 1996
BUKU CATATAN HARIAN
Konsumsi Rumah tangga Untuk Makanan,
Minuman, Rokok dan Tembakau

Lampiran 2

RAHASIA
SBH96-HR

SBH 96
SURVEI BIAYA HIDUP

Propinsi : JAWA TENGAH
Kabupaten/Kota (*) : BANYUWAS
Kecamatan/Kelurahan (*) : PURWAKERTO
Petara :
Nomor Kode Sampel : 212.501

Nomor Urut Sampel : 03
Nama Kepala RT : MURJONO
Hari : 1 (SENIN)
Tanggal-Bulan-Tahun : 3 JUNI 1996

Isikan jenis barang, kualitas/merk, banyaknya dalam satuan, nilai dalam rupiah, dan cara perolehan dari jenis barang yang dikonsumsi rumah tangga

Nomor Urut	Uraian Jenis Barang	Kualitas/Merek	Banyaknya Dalam Satuan	Nilai Konsumsi (Rp.)	Cara perolehan (kode)
(1)	(2)	(3)	(4)	(5)	(6)
1	Beras	Cisadane	1 kg	1000	1
2	Kecap	ABC	10 ml	100	1
3	Ketela pohon	Segar	1/2 kg	250 P)	3
4	Sayur asem	Segar	1 bungkus	300	1
5	Garem	Hancur	10 gram	10	1
6	Kangkung	Segar	5 ikat	500 P)	3
7	Telur ayam kampung	Baik	3 butir	600 P)	2
8	Roti manis	Coklat	2 biji	600	1
9	Gado-gado	Dengan lontong	2 bungkus	1000	3
10	Rokok keetek filter	Jarum super	2 batang	200	1
11	Cabe merah	Segar	2 buah	100	1
12	Ikan teri	Medan	2 ons	600	1
13	Minyak goreng	Bimoli	100 ml	200	1
14	Biji anas	Smaet	2 potong	20000	3
15	Beras	IR	100 kg	75000	1

*) Coret yang tidak perlu

Kode kolom (6) :
 Pembelian 1
 Produksi sendiri 2
 Lainnya 3

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APPENDIX G

SAMPLE SUMMARY SHEET FOR FOOD ITEMS: 1996 SBH



REPUBLIK INDONESIA
BIRO PUSAT STATISTIK

SBH 96
SURVEI BIAYA HIDUP

RAHASIA
SBH96-LK

SURVEI BIAYA HIDUP 1996

LEMBAR KERJA, KONSUMSI MAKANAN, MINUMAN, ROKOK DAN TEMBAKAU
SELAMA SEMINGGU

I. PENGENALAN TEMPAT		
1. Propinsi		□ □
2. Kabupaten/kotamadya *)		□ □
3. Kota/Kota administratif *)		
4. Kecamatan		
5. Kelurahan		
6. Strata		
7. Nomor wilayah pencacahan		
8. Nomor kode sampel		□ □ □ □ □ □ □ □
9. Nomor kelompok segmen		□
10. Nomor urut sampel		□ □
11. Nama kepala rumah tangga		

II. KETERANGAN PETUGAS		
Uraian	Pencacah	Pengawas
1. Nama petugas		
2. NIP/NMS *)		
3. Tanggal	s.d	s.d
4. Tanda tangan		

*) Coret yang tidak sesuai

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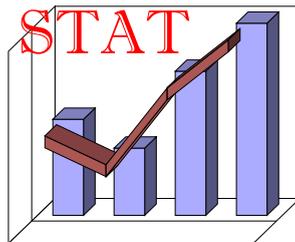
Is Susenas Rice Consumption in Urban Areas Understated?

QUARTERLY WAGE SURVEY OF LIVESTOCK AND FISHERY

Report # 68
Statistical Paper #16

by
Yahya Jammal
Uzair Suhaimi

April, 2003



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Quarterly Wage Survey of Livestock & Fishery

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Quarterly Wage Survey of Livestock & Fishery

I. INTRODUCTION

BPS has been conducting a quarterly wage survey (*Survei Upah Buruh*, SUB) since 1979/80. This establishment survey, which covers three major economic sectors (non-oil mining, non-oil manufacturing and hotels), undertook several changes since then. Starting with the second quarter of 1998, coverage was expanded to include three other sectors: trade, construction and livestock and fishery. What prompted such coverage expansion is not certain, but appears to have been motivated by a desire to cover major sectors in the national accounts which did not have wage data from other sources.

To date, published data are limited to the original three sectors while data for the newly added sectors are still under evaluation by BPS. This report describes that part of the survey which covers the livestock and fishery sector (*Survei Upah Kegiatan Usaha Peternakan dan Perikanan*, SUKUPP). After a description of the survey's design and management (in Section II), results for the 1998-2002 period are evaluated (in Section III) using a simple wage computation methodology. Finally, Section IV provides our main conclusion, namely that results appear to be plausible. Our recommendation is for BPS to make these results available to users for feedback, following which a cost/benefit assessment can be made on whether to continue the survey or divert existing resources to improving the currently published SUB.

II. DESCRIPTION

A. Purpose

This survey was designed to enable computation of changes in average wages paid by establishments in the livestock and fishery sector in Indonesia. The livestock sector is defined as that including the following eight 5-digit ISIC codes:¹

- 13110 (Breeding of large animals e.g. cattle, bulls, horses; *Pembibitan ternak besar*),
- 13120 (Breeding of small animals e.g. sheep, goats, pigs; *Pembibitan ternak kecil*),
- 13140 (Breeding of feathered animals e.g. poultry, birds; *Pembibitan ternak unggas*),
- 13210 (Culture of large animals; *Budidaya ternak besar*),
- 13220 (Culture of small animals; *Budidaya ternak kecil*),
- 13230 (Culture of animals not elsewhere classified; *Budidaya aneka ternak*),

¹ These codes pertain to KLUI (*Klassifikasi Lapangan Usaha Indonesia*) 1990, which is based on the International Standard Industrial Classification (ISIC) Revision 2.

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- 13240 (Culture of feathered animals; *Budidaya ternak unggas*) and
- 13244 (Culture of ducks; *Budidaya itik*).

The fishery sector is defined as that including the following four 5-digit ISIC codes:

- 17210 (Culture of sea animals; *Budidaya binatang laut*),
- 18210 (Fresh water biotic cultivation; *Budidaya/pembesaran biota air tawar*),
- 18230 (Brackish water biotic cultivation; *Budidaya biota air payau*) and
- 18240 (Brackish water biotic seedling; *Pembinihan biota air payau*).

The 1996 Economic Census was used as a sampling frame. It contained about 15,000 establishments in these ISICs, of which 273 were selected for this survey. Tables 1 and 2 provide the distribution of the original sample by province and ISIC respectively.

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Table 1
Original Sample by Province

Province	Number of Establishments	Share
Aceh	1	0.4%
North Sumatra	9	3.3%
West Sumatra	2	0.7%
Riau	1	0.4%
South Sumatera	4	1.5%
Lampung	5	1.8%
DKI Jakarta	6	2.2%
West Java	98	35.9%
Central Java	46	16.9%
Yogyakarta	3	1.1%
East Java	56	20.5%
Bali	8	2.9%
West Nusa Tenggara	3	1.1%
East Nusa Tenggara	2	0.7%
West Kalimantan	6	2.2%
South Kalimantan	2	0.7%
East Kalimantan	6	2.2%
North Sulawesi	1	0.4%
Central Sulawesi	2	0.7%
South Sulawesi	7	2.6%
Southeast Sulawesi	2	0.7%
Maluku	3	1.1%
Indonesia	273	100.0%

Table 2
Original Sample by ISIC

ISIC	Number of Establishments	Share
13110: Breeding of large animals	5	1.8%
13120: Breeding of small animals	5	1.8%
13140: Breeding of feathered animals	5	1.8%
13210: Culture of large animals	43	15.8%
13220: Culture of small animals	21	7.7%
13230: Culture of animals n.e.c.	2	0.7%
13240: Culture of feathered animals	120	44.0%
13244: Culture of ducks	1	0.4%
17210: Culture of sea animals	6	2.2%
18210: Fresh water biotic cultivation	7	2.6%
18230: Brackish water biotic	30	11.0%
18240: Brackish water biotic seedling	28	10.3%
Total	273	100.0%

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B. Questionnaire

The five-page questionnaire (a prototype is provided in Appendix A) is divided into four major blocks:

- Block I contains characteristics for identifying the establishment surveyed, including geographic codes, main product, year production began, ownership status and destination of product.
- Block II contains items identifying selected work characteristics of production workers below the level of supervisor (*mandor*),² including normal number of hours worked per week, number of shifts, minimum and maximum pay. Items in this block are not used in computation of the average wage. Rather, they are used during the editing process in consistency and plausibility checks.
- Block III contains general information about the distribution of all workers by gender and type (Block III.A), and detailed information about production workers below the level of supervisor (Block III.B). These are divided into four categories:
 - a. daily casual workers (*harian lepas/kontrak*): these are casual workers, that is, they work only when hired to perform a particular task, which is determined day by day. Once the task is completed, the establishment is under no obligation to keep them. Their earnings are based exclusively on the number of days worked (or agreed in the contract). They are usually not entitled to any remuneration or benefit other than the basic wage. Specifically, they do not get:
 - (i) an additional thirteenth month wage every year (*Tunjangan Hari Raya, THR*)
 - (ii) severance pay
 - (iii) protection against layoff
 - (iv) the legal minimum wage, since no daily minimum wage exists in labor laws, only a monthly one.
 - b. *borongan*: like the daily casual workers above, these are casual workers not entitled to any remuneration or benefit other than their basic wage. However, their earnings are based on the outputs that they produce, not the number of days worked, as is the case with daily casual workers.

² As is the case with the other sectors of the SUB, coverage of this sector is limited to workers below the supervisory level. The reason is that these are the wage earners of greatest interest for policy, since they are believed to be the most vulnerable to economic downturns and thus the most in need of government intervention during these times.

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- c. daily regular workers (*harian tetap*): these are regular employees on the establishment payroll who are paid based on the number of days worked. They may be entitled to employee fringe benefits such as health insurance, sick leave, vacation leave etc. Their earnings may vary depending on stipulations in their contract: some may only get a basic wage for days worked, others may get fringe benefits. They are usually entitled to the four types of benefits denied to casual workers (items (i) through (iv) above).
- d. permanent workers (*bulanan*)³: these are the establishment's permanent employees. They are paid on a monthly basis and may be entitled to employee fringe benefits (e.g. health insurance, sick leave etc.). The specific benefits to which they are entitled depend on what they would have successfully negotiated in their contract. At a minimum, they do get the four types of benefits denied to casual workers (items (i) through (iv) above).

The establishment is then required to provide the number of workers in each of the above four categories and to report on the relevant pay period (e.g. week, month).

- Block IV contains all the information required to compute the average wage rate of the establishment during the month surveyed. These include the payment period, number of days worked, number of workers (below the level of supervisor), wage components (basic salary, overtime, other payments) and the number of production workers.⁴

The average wage paid by the establishment during the month surveyed is then calculated in three steps:

- First the total number of production workers during the month is derived from reported figures in Block III.B (column 6).

³ Although the questionnaire refers to this category of employee as *bulanan*, the description in the fifth page of the questionnaire (see Appendix A) allows for salary payments made two or more times per month. That is why we believe that our description of such workers as "permanent" is more accurate.

⁴ This block also requires information on the number of workers and the total wage bill reported on the previous quarter's questionnaire. If the current quarter's number of workers or wage bill shows a change of 10% or more over that of the previous quarter, the establishment is asked to provide an explanation in Block V. However, very few establishments tend to provide such information.

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Quarterly Wage Survey of Livestock & Fishery

- A standardized total monthly wage bill for the establishment is computed from the various reported figures in Block IV (row 3d).
- The ratio of the monthly standardized wage bill to the number of workers is then calculated to represent the average monthly wage rate paid by the establishment.

C. Survey Administration

The survey is conducted by the BPS Sub-directorate of Earnings Statistics, which controls the first stage of quarterly operations (sample selection) and the final stage (data entry, editing/cleaning, computations) while the BPS field offices control the interim stages (establishment visits, consistency checks). As is done with the existing SUB, the sub-directorate covers this survey quarterly where field work is expected to be conducted during the month following the relevant calendar quarter (namely in April, July, October and January). For ease of administration, all questionnaires for a particular calendar year are sent to the relevant BPS provincial offices in March of that year. It is then the responsibility of the individual provincial offices to distribute them to the relevant district offices and to ensure that enumeration is conducted properly by the Mantri Statistik every quarter in a timely fashion. Mechanical consistency checks of reported data are conducted by the BPS district offices, which are best placed to revisit establishments when corrections are needed. Once checked, questionnaires are then sent to the relevant BPS provincial office.

At the end of every enumeration month, the BPS provincial office sends the original questionnaires to the sub-directorate, which is responsible for data entry, editing and further cleaning when necessary.⁵ The main output of this survey is basically two numbers for each establishment: the number of production workers below the supervisory level during the month and their total monthly wage bill. These are used to compute an average monthly wage rate. Note that, like the quarterly SUB, what is computed is an average wage for the *month* covered in the survey (March, June, September and December), not an average wage for the relevant *quarter*.

⁵ Despite the mechanical consistency checks performed by the district offices, some figures reported by establishments are sometimes implausible. Since the sub-directorate is ultimately responsible for providing the final results, its staff subject all reported figures to final plausibility checks by comparing figures from different blocks in the same questionnaire, and by comparing figures from different provinces and with other relevant national figures.

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III. COMPUTATIONS & RESULTS

A. Computation Methodology

Like the existing SUB, the SUKUPP was designed to track quarterly *changes* in wages, rather than quarterly *levels*, because from a policy perspective it is the change in real wages that is of most interest. One effective and feasible way to measure such changes is by using quarterly indices. Given the data collected in this survey, we believe that one can construct two alternative methods:⁶

- the first is to compute an index at the establishment level, then aggregate it over all establishments in the survey;
- an alternative formulation would be to calculate an average monthly wage level for all establishments in a particular quarter, then compare that level with consecutive ones by indexing them.

The advantage of the first formulation is its higher accuracy, since it calculates wage changes at the source. However, its main disadvantage is that it is highly demanding in terms of data (only establishments responding in two consecutive quarters can be used; weighting establishments by size becomes necessary) as well as management. The second alternative's characteristics are the flip side of the first one: its greatest advantage is its simplicity and less demanding management and data requirements (data for any establishment responding in any quarter can be used) but its main disadvantage is its lower accuracy, particularly if, for example, we ended up comparing substantially different sub-sets of establishments between quarters. The latter disadvantage, however, can be mitigated if enough controls are exercised over the survey operation to ensure that coverage in various quarters includes establishments with similar characteristics.

In evaluating the plausibility of the results of this survey, this report opted for the second formulation. Despite what we believe is its lower level of accuracy, that method was chosen because of its simplicity, but more importantly because it is the procedure followed in the existing SUB. To do that, a database of 259 establishments was constructed following these three steps:

- First, all 494 establishments providing some response between quarters 2, 1998 and 3, 2002 were grouped into a single data set.⁷

⁶ Other alternative indexing procedures can be used as well. However, they would probably possess more or less similar characteristics as the two used in this report. The two methods used here have been chosen primarily for illustrating major alternative characteristics.

⁷ Although the original sample had only 273 establishments (distributed as in Tables 1 and 2), it appears that over the 18 quarters in consideration substantial substitutions had taken place by the district offices. We have not investigated the procedure used for substitution by these offices for the purpose of this report. Should BPS decide to regularly publish results of this

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A quick visual scan of the data set revealed a large number of establishments which had responded inconsistently or had provided questionable responses.⁸

- The next step was then to eliminate from that database the 235 establishments responding for less than 5 out of the 18 quarters of the period in consideration. That left a cumulative 259 establishments with an average of only 182 establishments per quarter for which average wage data were available and an average response per establishment of 13 quarters.⁹ A further visual scan of data on the remaining establishments revealed a large number of gaps in response, which could further be corrected to improve coverage for any particular quarter.
- Gaps in response by establishments were then filled by interpolation. Thus an average monthly wage rate was estimated in a particular quarter only for an establishment which had responded in both a quarter *before* and a quarter *after* the one in question. Our implicit assumption was that the establishment must have remained in business during the period between responses. No attempt was made to backcast or to forecast data into periods of no response: only interpolation for a period *between* responses. This adjustment resulted in raising the average number of available entries per quarter to 215 (from 182) and raised the number of average response per establishment to 15 quarters (from 13).¹⁰ Although the impact of this adjustment was not significant, we believe that it was necessary in order to ensure stability of the final results.

Tables 3 and 4 show the distribution of the 259 establishments by province and ISIC respectively. As the tables show, establishments are heavily concentrated in three provinces (West, Central and East Java have 76%) and in two ISICs (about two-thirds are in ISIC 13240 –culture of feathered animals– and 13210 – culture of large animals). Such concentration has important operational as well as computational implications which we will not cover in this report.

survey, a clear and uniform policy for establishment substitution will need to be instituted and closely monitored by the sub-directorate.

⁸ Some of these cases appear to have been caused by data entry errors, others may have been caused by recording or reporting errors. We did not investigate them for the purpose of this report since our focus was solely on determining whether results of this survey to date were plausible. If BPS decides to regularly publish results of this survey, the sub-directorate will need to evaluate such cases and introduce necessary corrections.

⁹ Ten wage bill entries, which were obvious data entry errors, were corrected.

¹⁰ Of the final 3869 wage rate entries for the entire period, 593 (15%) were adjusted by interpolation, of which about one half (or 7% of all entries) were interpolations for one year, and a further 4% of all entries were interpolations for two consecutive years.

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Table 3
Sample Used in Computations by Province

Province	Number of Establishments	Share
Aceh	1	0.4%
North Sumatra	6	2.3%
Riau	1	0.4%
West Sumatra	4	1.5%
Lampung	3	1.2%
DKI Jakarta	3	1.2%
West Java	94	36.3%
Central Java	44	17.0%
Yogyakarta	3	1.2%
East Java	59	22.8%
Bali	8	3.1%
West Nusa Tenggara	3	1.2%
East Nusa Tenggara	1	0.4%
West Kalimantan	3	1.2%
South Kalimantan	3	1.2%
East Kalimantan	7	2.7%
North Sulawesi	1	0.4%
Central Sulawesi	3	1.2%
South Sulawesi	6	2.3%
Southeast Sulawesi	3	1.2%
Maluku	3	1.2%
Indonesia	259	100.0%

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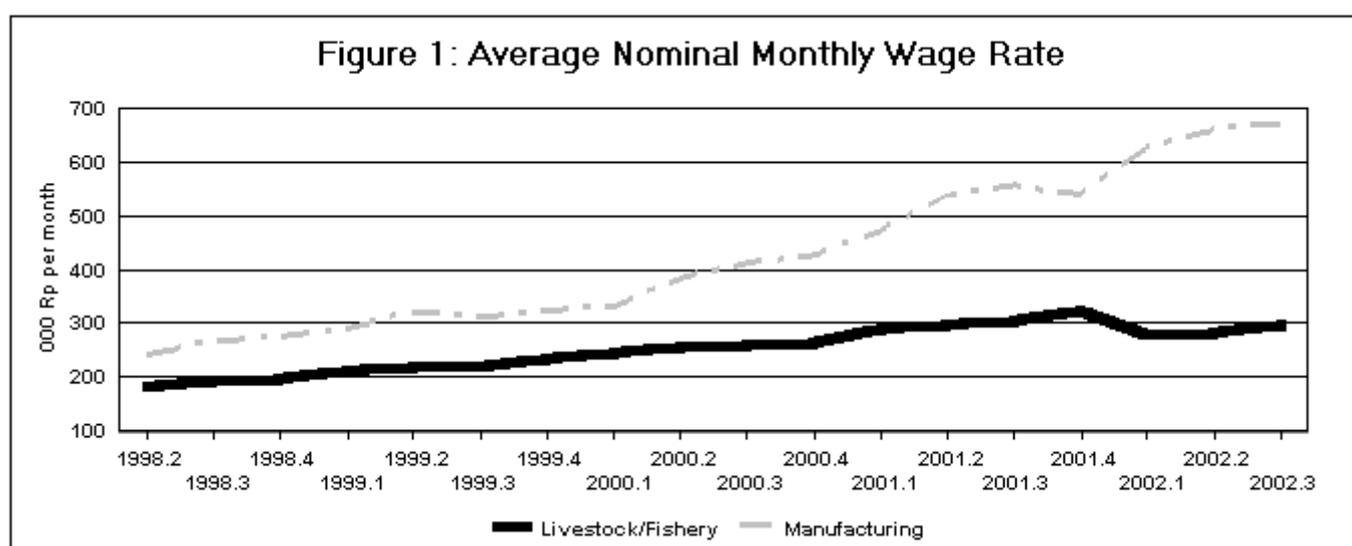
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Table 4
Sample Used in Computations by ISIC

ISIC	Number of Establishments	Share
13110: Farming of large animals	2	0.8%
13120: Farming of small animals	4	1.5%
13140: Farming of feathered animals	5	1.9%
13210: Culture of large animals	40	15.4%
13220: Culture of small animals	21	8.1%
13230: Culture of animals n.e.c.	1	0.4%
13240: Culture of feathered animals	127	49.0%
13244: Culture of ducks	1	0.4%
17210: Culture of sea animals	6	2.3%
18210: Fresh water biotic cultivation	3	1.2%
18230: Brackish water biotic	25	9.7%
18240: Brackish water biotic seedling	24	9.3%
Total	259	100.0%

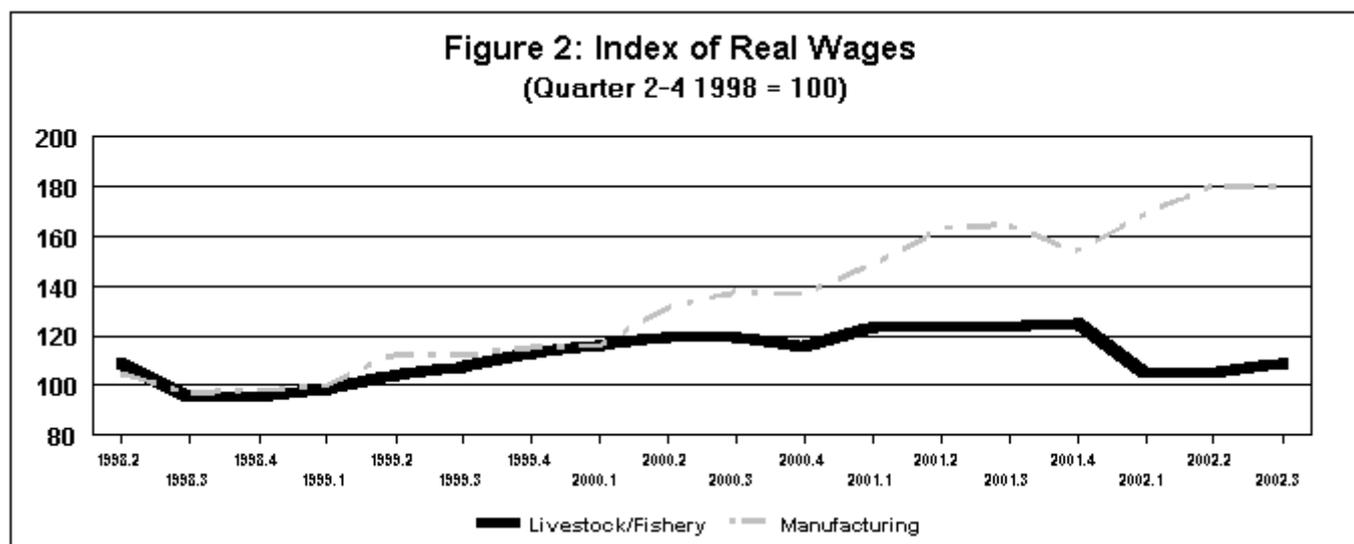
B. Results

As the data used in this report have not yet been published by BPS, we will provide the results of our evaluation only in graphical form. Figure 1 provides the average nominal monthly wage rate calculated using the above methodology, and the same measure from the published manufacturing SUB for Indonesia for comparison. Figure 2 shows the two measures deflated by the CPI in index form with the average for available data in 1998 as a numeraire equal to 100.



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The graphs reveal two interesting points:

- First, nominal wages in Livestock/Fishery (Figure 1) have witnessed a more or less steady quarterly growth rate of about 3% during the period (with a tapering of that growth during 2002) while those in manufacturing grew by an average 6% with a clearly sharper trend since 2000.
- As a result, there is a clear continuous divergence between the two in real terms (Figure 2) starting in the second quarter of 2000. Whereas wages in Livestock/Fishery reached in 2002 levels 5-9% higher than in 1998, wages in manufacturing reached levels 80% higher than those in 1998.

Figure 3 compares the real index in Livestock/Fishery with that of agricultural wages in Java derived from the monthly agriculture wage survey conducted by BPS in rural areas of Indonesia for the purpose of computing the farmers terms of trade (*Survei Tukar Petani*).¹¹ Strictly speaking, the two measures are not comparable since:

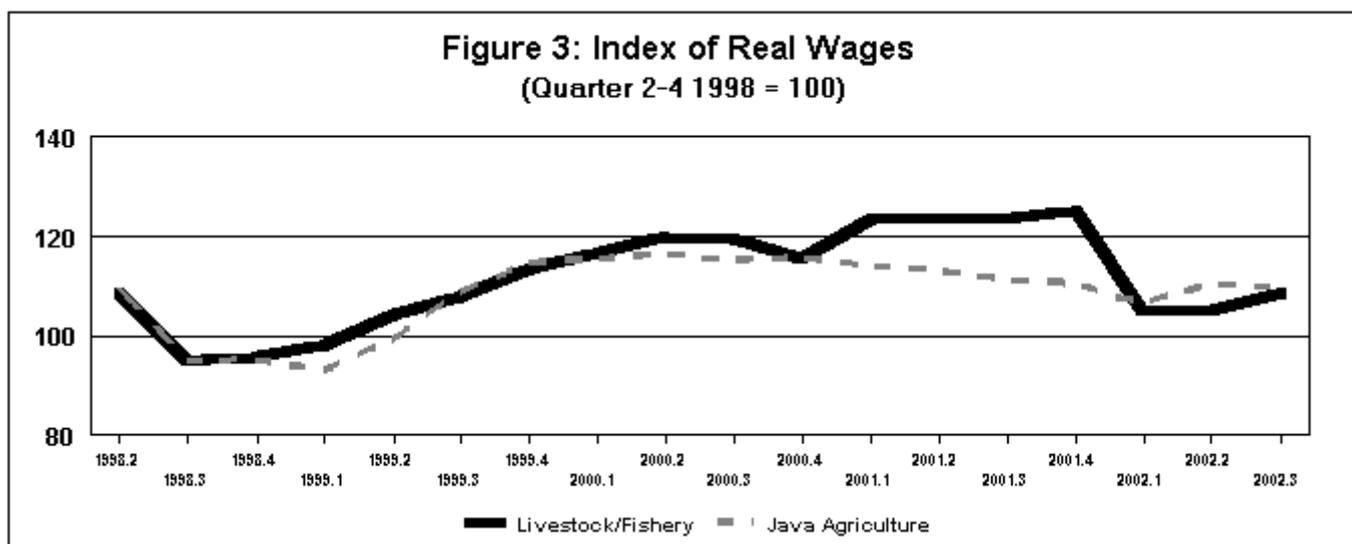
- the first covers all Indonesia while the second covers only Java¹² and
- the first is deflated using the CPI which covers urban areas while the second uses a deflator based on rural weights.

¹¹ Only data on the index of real wages (1996=100) were provided to us for this report.

¹² Although this is somewhat mitigated by the high Java concentration of the Livestock/Fishery survey.

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Nevertheless, a comparison may be useful in pointing towards potential implausibility in the Livestock/Fishery results. As Figure 3 shows, real wages in the two surveys followed a somewhat similar pattern during the period except for 2001. Both showed increasing index levels in 1999 and 2000 and comparable index levels in 2002. However, while agricultural wages were in steady decline in 2001, Livestock/Fishery wages showed an abrupt increase in the first quarter of 2001, steady index levels through the end of 2001 followed by an abrupt decrease in the first quarter of 2002.¹³

IV. CONCLUSIONS

Our main conclusion, therefore, is that the Livestock/Fishery survey provides plausible overall figures and our main recommendation is for BPS to share these results with users for their feedback. Beyond that, what should be done? If user feedback is positive and BPS desires to regularly publish quarterly results, then the following needs to be assessed before adoption on a regular basis is decided:

- A system needs to be put in place by the Sub-directorate of Earning Statistics for close monitoring of establishment substitution by district offices and for final cleaning of data. As reported in Section III.A above, the data used in this report were subjected to substantial cleaning, suggesting that the existing checks in the sub-directorate could be improved further. Ensuring a high enough response quarterly is essential for providing representative figures. In this report we used a cumulative panel

¹³ Wages in 2001 appear to have had larger shares of overtime and other remunerations than in the previous year.

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data set, which made our job easier. However, when computing data from quarter to quarter, the sub-directorate will need to have clear explicit, transparent and verifiable rules regarding establishment substitution.

- Results need to be made available to users in a timely fashion for them to be useful. Ideally results would have to be published with a lag of one quarter. The longer the lag, the less useful the results.
- Given the above demanding requirements, and given BPS's limited expected future budgets, the sub-directorate needs to subject this survey to a cost/benefit evaluation. In other words, now that we know that this survey produces plausible results, and assuming that users further request these results on a regular basis, one has to determine whether it is more beneficial to concentrate limited existing resources on improving the widely used current Manufacturing SUB or continuing the Livestock/Fishery survey. It is not clear at this point that devoting resources to the latter survey is the answer.

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APPENDIX A
QUESTIONNAIRE

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sangat rahasia



REPUBLIK INDONESIA
BADAN PUSAT STATISTIK

**SURVEI UPAH
KEGIATAN USAHA PETERNAKAN
DAN PERIKANAN**

DAFTAR VU-5

SATU ARJUN UNTUK BPS
SATU ARSIP PERUSAHAAN

AKAN DIAMBIL

Tanggal	Bulan	Tahun

Prop. Kab. Kode Perusahaan No. Unit

--	--	--	--	--	--

BUMBU PELAPORAN

--	--

BLOK I. KETERANGAN IDENTITAS PERUSAHAAN

1. Nama Perusahaan : _____

2. Alamat Perusahaan/Unit Produksi : _____
 _____ Kec. _____ Telp. _____

3. (a). Jenis Kegiatan Utama : _____
 _____ Diisi BPS PUSAT

(b). Apakah produk utama berubah sejak triwulan yang lalu ?
 YA -1 TIDAK -2. Bila "YA", jelaskan di BLOK V

(c). Tahun mulai produksi : _____

(d). Status modal usaha : _____

PMDN -1 Negara (BUMN, Persero, dsb) -3

PMA -2 Gabungan -4

Lainnya (sebutkan _____) -5

3. Apakah ada hasil yang diekspor tahun lalu ?

Ya -1 _____ % TIDAK -2

PERHATIAN

1. **Kewajiban** setiap responden untuk **memberikan keterangan yang diperlukan** dalam penyelenggaraan statistik dasar oleh BPS, diatur dalam pasal 27 Undang-Undang Nomor 16 Tahun 1997 tentang Statistik.
2. **Kewajiban** penyelenggara kegiatan statistik untuk **menjamin kerahasiaan** keterangan yang diperoleh dari responden, diatur dalam pasal 21 dan pasal 24 Undang-Undang Nomor 16 Tahun 1997 tentang Statistik.
3. Agar penyajian hasil survei tepat waktu, untuk bahan sidang perencanaan di Jakarta, perusahaan diharapkan dapat menyelesaikan pengisian kuisioner paling lambat **1 (satu) minggu setelah tanggal penerimaan**.

DITERIMA DI:

	Tanggal	Bulan	Tahun
BPS KAB/KOTA			
BPS PROP			
BPS PUSAT			

PENGECEKAN KARTU LAPORAN PERUSAHAAN (Y/T)

	Diisi dan Telangir	Butir 28 Ada "YA"	Alasannya telas ?
BPS KAB/KOTA			
BPS PROP			
BPS PUSAT			

BLOK II. KETERANGAN UMUM PERUSAHAAN HANYA UNTUK KARYAWAN PRODUKSI DI BAWAH TINGKAT PENGAWAS/MANDOR

1. HARI DAN JAM KERJA BIASA TANPA LEMBUR

Hari Kerja Seminggu	Jam Kerja Seminggu	Jumlah Shift/Plug Sehari
(1)	(2)	(3)
<input type="text"/> hari	<input type="text"/> jam	<input type="text"/> kali

2. TUNJANGAN YANG DIBAYARKAN SECARA TERATUR DALAM BENTUK NATURA
(lingkari nomor yang sesuai)

1. Makan saja	2. Angkutan/jemputan saja	<input type="checkbox"/>
3. Natura lainnya (sebutkan)	4. Kombinasi	

B. Tidak ada tunjangan dalam bentuk natura

3. UPAH TERENDAH/TERTINGGI (Termasuk tunjangan teratur) KARYAWAN PRODUKSI DIBAWAH TINGKAT PENGAWAS/MANDOR PER HARI/MINGGU/BULAN

(a). Terendah Rp. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> (b). Tertinggi Rp. <input type="text"/>	per <input type="text"/> per <input type="text"/>	Kode <input type="text"/> Kode <input type="text"/>	Kode 1 = Hari Kode 2 = Minggu Kode 3 = Bulan Kode 4 = Lainnya *) sebutkan
---	--	--	--

BLOK III. KETERANGAN KARYAWAN PERUSAHAAN

A. JUMLAH KARYAWAN

JENIS PEKERJAAN (1)	Laki-laki (2)	Perempuan (3)	Laki-laki + Perempuan (4)
1. Bukan Tenaga Kerja Pelaksana			
a. Manajer	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
b. Administrasi/Kantor	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
c. Lainnya (Resepsionis, Sekretaris, Supir, dsb)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
2. Tenaga Kerja Produksi			
a. Tenaga Kerja Ahli/Teknis	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
b. Tenaga Kerja Pengawas/Mandor	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
c. Karyawan Produksi di Bawah Tingkat Pengawas/Mandor	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
JUMLAH SELURUHNYA	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

Keterangan UPAH tidak perlu dimasukkan di BLOK IV

B. JUMLAH KARYAWAN PRODUKSI DI BAWAH TINGKAT PENGAWAS/MANDOR DI DAFTAR GAJI

SISTEM PEMBAYARAN (1)	STATUS KARYAWAN				JUMLAH (6)	Data UPAH di isi di BLOK IV pada
	Harian Lemas/Kontrak (2)	Berongan (3)	Harian Tetap (4)	Bulanan (5)		
1. Mingguan	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	KOLOM 2
2. Bulanan	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	KOLOM 3
3. Periode pembayaran lainnya **)						KOLOM 4
a. <input type="checkbox"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	KOLOM 5
b. <input type="checkbox"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
JUMLAH	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

*) Hanya untuk Karyawan produksi di bawah tingkat pengawas/mandor, dan untuk semua shift (sesuai Blok III A. Rincian 2c.)
 **) Lainnya : 2 mingguan, 4 bulanan, 10 hari sekali atau periode lain (sebutkan)

BLOK IV. KETERANGAN KARYAWAN PELAKSANA *) MENURUT SISTIM PEMBAYARAN UPAHNYA SELAMA SATU KALI PERIODE PEMBAYARAN

RINCIAN	SISTIM PEMBAYARAN **)			
	MINGGUAN	BULANAN	SISTIM LAINNYA (Sebutkan)	
		
(1)	(2)	(3)	(4)	(5)
<p>1. PERIODE PEMBAYARAN DAN HARI KERJA UNTUK PERIODE PEMBAYARAN TERAKHIR BULAN PELAPORAN</p> <p>a. Periode pembayaran upah dari tanggal berapa sampai berapa</p> <p>b. Jumlah hari kerja biasa pada periode pembayaran upah bb</p> <p>c. Jumlah hari kerja lembur pada hari libur selama periode pembayaran upah bb</p>	<p>Tgl. - s/d</p>	<p>Tgl. - s/d</p>	<p>Tgl. - s/d</p>	<p>Tgl. - s/d</p>
<p>2. JUMLAH KARYAWAN PELAKSANA DI DAFTAR GAJ SESUAI JUMLAH YANG DI ISIKAN PADA BLOK III B Kolom b</p> <p>(Laki - laki + Perempuan)</p>	<p>.....</p>	<p>.....</p>	<p>.....</p>	<p>.....</p>
<p>3. JUMLAH UPAH/GAJI DAN TUNJANGAN YANG DIBAYARKAN KEPADA SEMUA KARYAWAN PELAKSANA DI BAWAH TINGKAT PENGAWAS/MANDOR</p> <p>a. Upah/gaji pokok atau upah kotor kalau tunjangan tetap tidak dapat dipisahkan</p> <p>b. Tunjangan lainnya yang dibayarkan dalam setiap periode pembayaran secara kumulatif dalam bentuk uang ***)</p> <p>c. Upah lembur pada hari kerja biasa dan pada hari libur</p> <p>d. Jumlah (a + b + c)</p>	<p>(Dalam ribuan Rp.)</p> <p>.....</p>	<p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p>	<p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p>	<p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p> <p>.....</p>
<p>4. RATA-RATA UPAH PER KARYAWAN UNTUK SISTIM PEMBAYARAN UPAH YANG SAHA</p> <p>(Rincian 3d ÷ Rincian 2 x 100)</p>	<p>(Dalam Rupiah)</p> <p>.....</p>	<p>(Dalam Rupiah)</p> <p>.....</p>	<p>(Dalam Rupiah)</p> <p>.....</p>	<p>(Dalam Rupiah)</p> <p>.....</p>
<p>5. KETERANGAN YANG DISALIN DARI KUESIONER VU-5 TERDAHULU SEBELUMNYA</p> <p>a. Jumlah karyawan (Bk IV Rincian 2, terusan sebelumnya)</p> <p>b. Jumlah upah/gaji dan tunjangan (Bk IV Rincian 3d, terusan sebelumnya)</p>	<p>Jika terjadi perubahan > 10 % terhadap periode pembayaran terakhir terakir ini, lampirkan di cek apakah data konsisten antar terakir dan melampirkan di BLOK V terakir terakhirnya</p>			
<p>6. Jumlah karyawan</p> <p>(Bk IV Rincian 2, terusan sebelumnya)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>
<p>7. Jumlah upah/gaji dan tunjangan</p> <p>(Bk IV Rincian 3d, terusan sebelumnya)</p> <p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>	<p>.....</p> <p>(Dalam ribuan Rp.)</p>

Catatan:
 *) Di bawah Tingkat Pengawasan/Mandor sesuai dengan BLOK III B Kolom 4
 **) Disi hanya untuk sistim pembayaran yang ada di perusahaan Anda
 ***) Tidak termasuk THR, bonus/insentif tahunan, semesteran, kuartalan dan tunjangan dalam bentuk natura

PENJELASAN

BLOK II. KETERANGAN UMUM PERUSAHAAN (HANYA UNTUK KARYAWAN PRODUKSI DI BAWAH TINGKAT PENGAWAS/MANDOR)

- 1.a. **Hari kerja biasa** adalah hari-hari yang ada kegiatan kerja biasa selain hari libur yang dipakai untuk lembur. Hari minggu yang umumnya pakai untuk bekerja shift/plug dimasukkan sebagai hari kerja biasa.
- b. **Jam kerja seminggu** adalah banyaknya jam kerja biasa/normal dalam satu minggu yang biasa digunakan untuk bekerja tidak termasuk jam istirahat/lembur.
2. **Tunjangan yang dibayarkan secara teratur dalam bentuk natura.**
Lingkari salah satu kode yang sesuai dan tuliskan dalam kotak.
3. **Isikan upah terendah/tertinggi (termasuk tunjangan teratur) dari karyawan produksi di bawah tingkat pengawas/mandor yang dibayarkan secara teratur.**
Isikan kode satuan waktu di kotak paling kanan. Per hari berkode 1, per minggu berkode 2, per bulan berkode 3 dan kode 4 untuk periode pembayaran lainnya (tuliskan periode pembayarannya misalnya 2 mingguan, 10 harian, dsb).

BLOK III. KETERANGAN KARYAWAN PERUSAHAAN**A. JUMLAH KARYAWAN PERUSAHAAN**

1. **Bukan Tenaga Kerja Produksi** adalah karyawan yang tidak secara langsung melakukan kegiatan produksi.
 - a. **Manajer** adalah yang merencanakan, mengorganisasikan, mengkoordinasikan dan memimpin perusahaan.
 - b. **Administrasi/Kantor** adalah yang menjalankan semua kegiatan tata usaha/ administrasi di kantor (seperti urusan pegawai, pembukuan, dll).
 - c. **Lainnya** adalah karyawan bukan tenaga kerja produksi yang tidak termasuk dalam kategori a dan b (misalnya sopir, penjaga kantin, dll).
2. **Tenaga Kerja Produksi** adalah karyawan yang secara langsung bekerja dalam proses produksi.
 - a. **Tenaga Kerja Ahli/Teknis/Ahli Mesin** adalah karyawan yang merawat dan memperbaiki alat-alat produksi.
 - b. **Tenaga Kerja Pengawas/Mandor** adalah karyawan yang bertugas mengawasi dan mengkoordinasikan kegiatan para karyawan pada unit/sektor produksi.
 - c. **Tenaga Kerja Di Bawah Tingkat Pengawas/Mandor** adalah karyawan produksi yang tidak termasuk dalam kategori a dan b meliputi kepala regu, peneriman, operator mesin, pembekas, dll.

B. JUMLAH KARYAWAN PRODUKSI DI BAWAH TINGKAT PENGAWAS/MANDOR DI DAFTAR GAJI

Isikan jumlah karyawan produksi sesuai daftar karyawan menurut status karyawan dan sistem pembayaran termasuk yang sedang cuti, sakit, dsb.

STATUS KARYAWAN

1. **Harian Lepas** adalah status karyawan yang dibayar berdasarkan jumlah hari kerjanya. Umumnya upah mereka tidak dapat dipisahkan antara gaji/upah pokok dan tunjangan lainnya. **Kontrak** adalah status karyawan yang dibayar berdasarkan kontrak kerja.
2. **Borongan** adalah status karyawan yang dibayar langsung oleh perusahaan berdasarkan hasil kerja yang dihitung per satuan hasil, tidak termasuk karyawan borongan yang bekerja di rumah sendiri secara makloon.
3. **Harian Tetap** adalah status karyawan yang dibayar berdasarkan jumlah hari kerjanya. Biasanya upah mereka terdiri dari upah pokok dan tunjangan tetap yang mungkin dapat dipisahkan sehingga kalau karyawan/pekerja absen, bisa dihitung potongan upahnya sesuai aturan yang berlaku.
4. **Bulanan** adalah status karyawan yang menerima upah/gaji pokok secara tetap setiap periode pembayaran (umumnya bulanan kecuali tunjangan-tunjangan dan perangsang lainnya yang tergantung jumlah hari kerjanya/jam kerja karyawan yang bersangkutan). Bila karyawan bulanan dibayar 2 kali atau lebih dalam sebulan tetap dimasukkan sebagai karyawan bulanan.

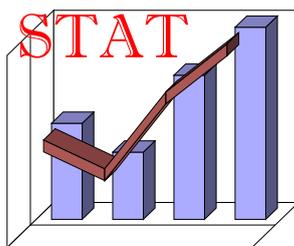
SISTEM PEMBAYARAN (PAY ROLL)

BENCHMARKING SUSENAS HEALTH AND EDUCATION DATA

Report # 69
Statistical Paper # 17

by
**Yahya Jammal
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May, 2003



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I. INTRODUCTION

BPS has been collecting data on different types of household expenditure using the Susenas surveys since the 1960s. With increasing demand from users for more detailed information, BPS began to conduct in the 1980s infrequent but more specialized surveys on particular characteristics, including expenditure. Despite the abundance of data in Susenas involving rupiah expenditure, its publications were limited to tabulations of expenditure shares rather than levels. One reason for the reluctance to publish expenditure levels was the need to avoid confusing users: when different levels for the same variable are produced for the same year, users may question the reliability of the whole methodology.

In the past two years, BPS has used a methodology which creates a consistent data set from two different data sources for the same variable, a methodology referred to as benchmarking. Essentially, benchmarking creates a set of adjusted data that incorporates *levels* from one less frequent source while preserving, as much as possible, *changes* or fluctuations from the other more frequent source.

BPS has already used the methodology successfully to ensure consistency between the monthly/quarterly manufacturing production surveys and the more complete annual manufacturing surveys and has provided preliminary results in a separate publication.¹ In the past year, BPS has also been working on a statistical revision of the historical GDP series by benchmarking the 43 sub-sectoral production accounts to their corresponding levels in the 1990, 1995 and 2000 levels obtained from the more complete Input-Output tables.

An additional area in which benchmarking holds the promise of substantial benefits to users is that of Susenas data. The present report applies this methodology to two variables: expenditure on education and expenditure on health. The hope is that this would set the stage for further application to other variables in Susenas which may be of interest to users.

II. METHODOLOGY

A. SUSENAS Survey Description

Susenas is a multi-purpose household survey which has been conducted regularly since the 1960s and has constituted the primary source for data on socio-economic characteristics of the population in Indonesia. Its frequency, coverage and questionnaires have undertaken

¹ *Benchmark Production and Employment Indices of Large and Medium Manufacturing: 1993 - 2000*, October, 2001.

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several changes over time. A comprehensive description of the development of this survey, including design, management, tabulations and dissemination through 1996 is documented in a 1997 BPS publication.² In this report, we will not attempt to duplicate the contents of that publication. Rather, we will briefly describe major characteristics of the survey which are relevant to the subject of this report and material changes, if any, to what was described in the earlier publication.

Since the 1990s Susenas has been divided into two major undertakings: an annual *core* survey designed to track developments in major household characteristics and a tri-annual *module* designed to measure in more detail specific household characteristics. Three *module* surveys have been conducted in the past decade:

- one on household income and expenditure,
- one on culture, criminality, tourism and welfare and
- one on health, education and housing

In order to spread workload more evenly, each *module* has been conducted once every three years. Thus, in any one year two surveys have typically been conducted at the same time: a *core* survey and one of the *modules*. This has been the general pattern over the past decade. Actual implementation may have differed slightly from year to year depending on policy priorities and budget considerations.³

1. Core

The *core* survey is generally designed to provide adequate representation of the major household characteristics at the kabupaten level. Thus it has a less detailed questionnaire but covers a large number of households (about 200,000 households since 1993). It is typically conducted in the month of February every year and requires an interview between a BPS enumerator (the *mantri statistik*) and the head of the household.⁴ During the interview, the enumerator would ask questions as stated in the questionnaire (Appendix A provides the relevant pages of a typical questionnaire) and would record the answers. Questions generally

² Surbakti, Pajung, *Indonesia's National Socio-Economic Survey: A Continual Data Source for Analysis on Welfare Development*, Central Bureau of Statistics, 1997.

³ For example, starting in 2000, education was split from health and housing and added to the second *module* survey.

⁴ If the head of the household is not present at the time of the interview, then any adult household member (excluding servants) who is knowledgeable about the household could answer.

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require answers covering the previous month (*sebulan yang lalu*) and the previous year (*12 bulan yang lalu*).⁵ Questions on health and education expenditure are limited to two:

- “What were the household’s expenditure on education (registration, tuition, boy/girl scouts, extra-curricular activities and others?” (*Pengeluaran biaya pendidikan --uang pendaftaran, SPP, POMG/BP3, uang pangkal/daftar ulang, pramuka, prakarya, kursus dan lainnya*).⁶
- “What were the household’s expenditure on health (hospitalization, family planning, medical doctors, witch doctors, medicines and others?” (*Pengeluaran biaya kesehatan --rumah sakit, puskesmas, dokter praktek, dukun, obat-obatan, dan lainnya*).⁷

To each question the respondent is expected to provide a rupiah figure for total expenditure in the month and year preceding the interview.

Field work is conducted more or less evenly throughout the month of February. Data entry is then undertaken by the BPS regional offices: provincial offices decide on whether the activity should be conducted by their local kabupaten offices or centrally in the provincial office. Data files and original questionnaires are then sent to the BPS Head Office for cleaning and tabulation, a process which normally takes place between the months of June and August, before results are finally published in November of that year.

2. Module

The *module* survey is generally designed to provide adequate representation of detailed household characteristics at the national level. Thus it has a detailed questionnaire but covers a smaller number of households (about 65,000 households since 1992). Like the *core* survey, it is typically conducted in the month of February and requires an interview between a BPS enumerator and the head of the household. Unlike the *core* survey, which requires answers covering the household as a unit (for health and education questions), the *module* survey requires answers covering individual household members. Also unlike the *core* survey, for which the questionnaire contents have been more or less the same every year, questionnaires for the health

⁵ The operational guidelines give the respondent a choice between the calendar month (year) or the previous month (12 months) from the date of the interview. Thus responses from households may not necessarily cover consistently the same calendar period.

⁶ Question VII.B.19 in the questionnaire in Appendix A.

⁷ Question VII.B.20 in the questionnaire in Appendix A.

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and education *module* surveys have undergone several changes, some significant. In what follows we will briefly describe the main features of each one of the surveys since 1992.

First, the education *module*:

- in 1992, both health and education were covered in the same survey. For education, besides the main characteristics of household members (e.g. level of schooling, reason for dropping out, reason for not attending school, field of study, average daily school time etc.), the household was required to report for every eligible household member the rupiah expenditure in the previous week and in the previous month for every one of the following fees and charges (relevant pages of the questionnaire are provided in Appendix B):⁸
 - a. Registration (*uang pendaftaran*)
 - b. Tuition (*iuran-iuran*), which in turn is divided into fourteen components
 - c. Examination (*evaluasi*), divided into eight components
 - d. School uniforms (*seragam sekolah*), divided into three components
 - e. Athletic material (*seragam olah raga*), divided into three components
 - f. Books and stationery (*buku, alat tulis dan sejenisnya*), divided into three components
 - g. Other (*Lain-lain*), divided into two components
 - h. Transportation (*transportasi*)
 - i. Snacks (*uang saku*)
 - j. Courses (*kursus-kursus*)
 - k. Other (*lainnya*)

Thus, a total of thirty-eight types of expenditure were included.

- in 1995, both health and education were also covered in the same survey. For education, the number of types of fees was cut to thirteen (from thirty-eight) consolidated into the following categories (relevant pages of the questionnaire are provided in Appendix C):⁹
 - a. Registration (*pendaftaran*)
 - b. Tuition (*iuran*), which in turn is divided into five components

⁸ Questions VII.I through VII.III in the questionnaire in Appendix B.

⁹ Questions VII.I through VII.IV in the questionnaire in Appendix C.

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- c. Examination (*evaluasi/ujian*)
- d. Study material (*bahan penunjang mata pelajaran*)
- e. Uniforms (*seragam sekolah & olah raga*)
- f. Books and stationery (*buku, alat tulis dan perlengkapan bersekolah*), divided into two components
- g. Transportation (*transportasi*)
- h. Extra-curricular activities (*kursus sehubungan dengan sekolah*)
- i. Other (*lainnya*)

In addition, the household was required to report for every eligible household member expenditure in the previous month and in the previous year. Reporting for the previous week, used in 1992, was dropped.

- in 1998, although the *module* covered both education and health, separate questionnaires were used for the two topics. The reason for the separate questionnaire, according to knowledgeable officials involved in the design of that survey, was the greater detail included in the health questionnaire for the first time. For education, although the same questions were asked as in the 1995 questionnaire, the household was required to provide figures for the previous month and for the period between July and December of the previous year, not for twelve months, as in 1995 (relevant pages of the questionnaire are provided in Appendix D).
- in 2000, education was separated from health and added to the *module* covering culture. Two major changes were introduced to the earlier questions on education:
 - a. First, the household was no longer required to report on expenditure in the previous month. Only expenditure for the July-December 1999 period were required.
 - b. The breakdown of individual components underwent a slight modification in formatting but not in substance.¹⁰
 (relevant pages of the questionnaire are provided in Appendix F).

The Health *module* underwent the following changes:

- in 1992, besides the main characteristics of household members (whether sick, type of sickness, use of medicines etc.), the household was required to report for every eligible household

¹⁰ Question VII.35 in the questionnaire in Appendix F.

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member the rupiah expenditure in the previous month on five items (relevant pages of the questionnaire are provided in Appendix B):¹¹

- a. Cost of outpatient care (*rawat jalan*): this was divided into two components (expenses from own sources and those from other sources)
 - b. Cost of inpatient care (*rawat inap*): this was also divided into the two sources of funds as in a.
 - c. Cost of medicines (*biaya pembelian obat-obatan ringan dan vitamin*)
 - d. Maternity expenses (*biaya persalinan*): this was also divided into the two sources of funds as in a.
 - e. Current pregnancy expenses (*biaya pengobatan dan pemeriksaan yang dikeluarkan untuk kehamilan sekarang*): also divided into the two sources of funds as in a.
- in 1995, the questions were consolidated into two (relevant pages of the questionnaire are provided in Appendix C):¹²
- a. Cost of outpatient care (*rawat jalan*), including medications.
 - b. Cost of inpatient care (*rawat inap*), including medications.

Like the 1992 questionnaire, households were required to provide expenditure data only in the previous month.

- in 1998, a far more detailed questionnaire than in the past was designed. Major changes were introduced to the earlier questions. Reporting, by eligible household member and applicable to the previous month, was required for the following questions (relevant pages of the questionnaire are provided in Appendix E):
- a. Cost of personal medicines purchased (*biaya mengobati sendiri*).¹³

¹¹ Questions V.4, V.5, V.6, V.15 and V.17 in the questionnaire in Appendix B.

¹² Questions V.3 and V.6 in the questionnaire in Appendix C.

¹³ Questions V.1 and V.2 in the questionnaire in Appendix E.

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- b. Cost of outpatient care (*biaya berobat jalan*): the household was required to provide detailed figures about the place in which they were spent (government hospital, private hospital, private physician, family planning center etc.) during the previous month. They were also required to differentiate between expenditure paid directly by the household and their estimate of the total cost (including, for example, those paid by insurance companies, the government or relatives outside the household).¹⁴ In addition, a further question was asked about the total estimated amount paid during the previous month on regular consultations not related to a particular illness (*konsultasi/pemeriksaan kesehatan, kir kesehatan, periksa hamil, periksa bayi*, Question V.8).
 - c. Cost of hospitalization/in-patient care (*biaya rawat inap*): the household was required to provide detailed figures about the place in which they were spent (government hospital, private hospital, maternity etc.) during the previous year. Here again, they were required to differentiate between direct expenditure from household sources and their estimate of the total cost.¹⁵
- in 2001 the health *module* questions generally undertook a slight formatting, but not substantive, modification (see Appendix G for relevant pages of the questionnaire). The only exception was the explicit requirement that the detailed expenditure categories refer to payments made solely from the household's own sources.

3. Conclusion

To summarize the main findings of the above sections:

- The *core* survey covers far more households than the *module* (200,000 vs 65,000). Consequently, the sampling error in the former is expected to be lower than that in the latter. However,
- the *module* survey involves a far more elaborate set of questions (by individual household member and including several components for every variable measured), a methodology

¹⁴ Question V.6 in the questionnaire in Appendix E.

¹⁵ Question V.11 in the questionnaire in Appendix E.

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believed to produce more accurate figures than the single questions asked in the *core*. Consequently, the non-sampling error in the *module* is believed to be lower than that in the *core*.

BPS Head Office officials intimately involved in these surveys in the last decade believe that the levels obtained from the *module* surveys are generally more accurate than those in the *core*, and therefore can serve as *benchmarks* in the years that they are available. The officials' implicit assumption is that the differential in non-sampling error between the two surveys outweighs the differential in sampling error for a particular variable. To our knowledge, no rigorous test has ever been conducted to measure the extent of these two types of error. The belief is simply based on firsthand intimate knowledge of the surveys. This report will not pass judgement on the merit of this belief. Rather, it will attempt to show the results based on it. In other words, assuming that the health and education figures in the *module* surveys are more accurate than those in the *core* surveys, the report describes the results of benchmarking *core* figures to *module* figures.

B. Computations

1. *Core*

The total expenditure on education from the *core* surveys used in this report for the 1992-2002 period were derived from Question VII.19 in Appendix A: column 2 for those in the "previous month" and column 3 for those in "the previous 12 months." Those for health were derived from Question VII.20 columns 2 and 3 respectively for the "previous month" and "previous 12 months." Data were aggregated by province. Household weights were uniform within a particular kabupaten, but different between kabupatens.¹⁶

The ratio of annual to monthly expenditure derived from the *core* surveys are provided in Tables 1 and 2 respectively for education and health. While annual education expenditure tend to be incurred more or less regularly during the year (as indicated by the ratios in Table 1 which are typically close to 12), annual health expenditure are typically only five times those incurred in January/February.

¹⁶ Between 2000 and 2002, some provinces were not covered completely in the surveys. For the purpose of this report, the following adjustments were made for both education and health data and for both the "previous month" and the "previous 12 months:"

- For 2000, data for Aceh and Maluku were interpolated.
- For 2001, data for Aceh were interpolated
- For 2002, data for Aceh, Maluku and Irian Jaya were adjusted for undercoverage. Available data covered only the capital cities in these provinces. They were adjusted using the 1999 ratio of expenditure in the capital city to those in the province as a whole.

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Table 1
Ratio of Annual to Monthly Education Expenditure in the Susenas Core Survey

Province	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Average
Acch	11.5	12.1	11.1	9.0	10.4	10.2	10.7	10.4	11.1	11.9	12.7	11.0
Sumatera Utara	10.2	11.8	11.6	10.5	10.6	12.1	11.0	11.1	12.8	11.8	11.9	11.4
Sumatera Barat	15.0	12.0	12.5	9.9	10.2	12.5	10.8	12.0	11.2	10.9	11.5	11.7
Riau	11.5	11.9	11.3	11.0	11.0	11.3	12.1	12.0	13.2	12.2	11.0	11.7
Jambi	12.9	9.2	9.0	9.2	10.5	10.4	10.2	10.1	10.5	10.1	10.7	10.3
Sumatera Selatan	11.6	11.5	11.3	11.0	12.0	11.2	12.0	11.6	10.7	13.1	11.3	11.6
Bengkulu	12.0	12.0	10.8	11.5	11.3	12.2	10.8	12.4	10.3	12.7	10.7	11.5
Lampung	11.7	11.0	10.5	7.8	11.3	10.2	11.0	10.5	11.7	9.5	12.4	10.7
DKI. Jakarta	13.2	13.6	11.8	10.9	12.9	10.7	10.0	12.0	12.0	10.6	13.7	11.9
Jawa Barat	10.2	12.4	11.3	10.0	12.3	10.3	11.2	12.7	13.4	12.1	13.0	11.7
Jawa Tengah	10.5	11.9	11.6	11.1	11.5	11.7	11.7	11.1	13.3	11.8	11.9	11.6
DI. Yogyakarta	10.5	11.4	12.4	11.4	13.0	14.8	12.6	12.2	8.7	9.5	9.8	11.5
Jawa Timur	11.0	11.9	12.1	11.3	12.3	12.1	12.3	12.0	12.3	11.7	12.1	11.9
Bali	10.7	11.8	10.7	10.5	10.3	11.6	10.4	10.8	12.0	11.9	11.2	11.1
Nusa Tenggara Barat	9.9	12.3	10.6	9.7	10.9	10.9	11.5	11.0	11.4	9.6	11.0	10.8
Nusa Tenggara	10.6	9.9	8.8	7.6	7.8	8.5	9.1	8.4	9.4	9.9	10.0	9.1
Kalimantan Barat	12.2	11.2	12.1	10.1	12.3	11.5	11.8	12.2	12.8	11.1	11.7	11.7
Kalimantan Tengah	10.6	10.0	11.1	9.7	10.7	10.5	10.2	10.8	12.6	10.5	9.9	10.6
Kalimantan Selatan	10.8	12.3	11.5	9.2	12.8	12.8	8.0	10.8	11.4	10.8	11.8	11.1
Kalimantan Timur	11.5	11.3	12.2	11.3	12.1	11.7	12.0	11.4	12.2	11.3	10.1	11.6
Sulawesi Utara	10.2	10.6	10.2	9.9	11.7	10.3	10.4	10.4	12.0	10.5	10.3	10.6
Sulawesi Tengah	11.2	9.5	9.7	10.0	10.5	9.8	10.6	10.8	10.6	9.8	9.5	10.2
Sulawesi Selatan	12.2	9.8	10.5	9.5	10.3	10.6	10.7	10.0	11.0	8.9	11.4	10.4
Sulawesi Tenggara	13.2	9.9	8.9	9.3	9.8	9.1	8.9	11.7	9.0	8.6	9.0	9.8
Maluku	9.1	10.9	10.8	10.8	11.8	12.5	11.9	11.4	11.5	11.6	8.7	11.0
Irian Jaya	9.9	10.9	11.2	9.6	11.2	11.7	11.2	11.0	11.9	11.4	14.0	11.3
Total	11.1	12.1	11.5	10.4	11.9	11.2	11.1	11.7	12.3	11.4	12.2	11.5

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Table 2
Ratio of Annual to January/February Health Expenditure in the Susenas Core Survey¹⁾

Province	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Average
Aceh	4.1	6.8	6.9	4.8	7.0	5.9	6.8	6.5	6.0	5.5	5.1	5.9
Sumatera Utara	5.1	7.1	5.2	5.2	6.4	4.6	5.7	5.9	5.7	4.5	5.8	5.6
Sumatera Barat	5.1	6.7	6.4	5.3	6.6	6.4	6.1	6.1	5.4	6.2	6.9	6.1
Riau	5.0	6.6	6.6	6.9	6.2	6.2	7.7	7.4	6.5	5.1	6.8	6.5
Jambi	3.7	8.1	6.2	5.7	8.1	6.5	5.4	6.0	5.5	3.2	5.5	5.8
Sumatera Selatan	3.9	6.3	6.4	6.7	5.3	5.5	5.0	5.8	5.9	5.0	6.6	5.7
Bengkulu	3.5	6.6	6.1	4.5	5.1	4.2	6.0	5.8	4.4	4.9	6.8	5.3
Lampung	5.2	6.7	4.7	4.8	6.3	7.2	5.4	5.5	5.2	4.2	6.6	5.6
DKI. Jakarta	5.0	7.3	6.5	4.0	6.2	4.7	6.2	5.2	4.7	4.0	6.8	5.5
Jawa Barat	3.2	5.5	5.8	5.2	5.5	5.0	5.0	5.9	4.9	4.3	5.6	5.1
Jawa Tengah	3.7	5.5	5.7	5.2	4.8	4.3	5.9	5.4	4.9	4.9	6.1	5.1
DI. Yogyakarta	5.2	5.6	5.8	5.0	6.4	3.9	7.8	5.5	5.6	6.2	8.8	6.0
Jawa Timur	4.1	5.1	5.6	4.8	5.3	5.0	5.9	5.6	4.6	5.5	5.4	5.2
Bali	3.1	5.0	5.0	4.5	5.4	4.5	5.8	4.8	5.7	6.0	7.1	5.2
Nusa Tenggara Barat	3.5	5.4	5.2	4.7	5.6	5.2	5.5	5.0	4.2	3.4	4.7	4.8
Nusa Tenggara	4.1	5.9	5.5	4.8	5.4	5.2	5.6	5.0	4.7	4.3	4.2	5.0
Kalimantan Barat	3.5	6.0	5.4	5.3	5.4	5.5	6.1	6.4	4.9	4.6	6.5	5.4
Kalimantan Tengah	3.9	6.7	7.4	5.1	5.8	7.2	6.5	6.2	4.6	5.1	6.5	5.9
Kalimantan Selatan	4.5	5.6	6.2	4.8	5.2	5.5	5.8	5.4	3.9	5.5	6.0	5.3
Kalimantan Timur	5.1	6.9	6.4	4.8	5.8	4.9	5.4	4.4	4.6	5.7	5.8	5.4
Sulawesi Utara	3.5	5.7	5.8	5.2	5.1	3.9	6.8	6.0	5.0	4.0	5.4	5.1
Sulawesi Tengah	4.4	5.1	6.1	4.6	5.1	4.9	5.2	5.5	3.9	3.6	4.9	4.8
Sulawesi Selatan	4.7	7.3	6.2	4.2	5.6	5.5	5.9	5.4	4.0	4.1	5.5	5.3
Sulawesi Tenggara	3.8	4.9	5.7	5.7	7.2	6.9	6.6	6.3	4.3	4.3	5.6	5.6
Maluku	4.3	6.3	7.4	5.7	6.8	6.5	7.6	8.1	7.4	6.7	5.6	6.6
Irian Jaya	5.3	5.8	5.4	5.6	6.5	6.7	6.3	6.8	5.5	5.8	15.4	6.8
Total	4.0	5.8	5.8	5.0	5.6	5.0	5.8	5.6	4.9	4.7	6.0	5.3

1) Expenditure refer to those incurred in the month prior to the interview. Given the interviews for both surveys have taken place throughout the month of February of the relevant year, expenditure in the surveys refer roughly to the average monthly expenditure in the January/February period.

2. Education Module

The total annual expenditure on education from the 1995, 1998 and 2000 *module* surveys were derived as follows:¹⁷

- for 1995, and since reporting was for the full calendar year, computation was straightforward: it was simply the sum of all

¹⁷ Complete data for the 1992 *module*, which covered both education and health, were not available within the time frame of this report, so they were not used as benchmarks.

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Benchmarking Susenas Health and Education Data

charges and fees reported for the year (Questions VII.I through VII.IV in the questionnaire in Appendix C).

- for 1998, since reporting was only for the July-December period, an adjustment needed to be made to obtain an annual equivalent: some charges (namely tuition, examination, study material, transportation and extra curricular activities –*iuran, evaluasi/ujian, bahan menunjang mata pelajaran, transportasi, kursus sehubungan dengan sekolah*) were considered likely to be incurred regularly and were thus doubled,¹⁸ while the remaining charges (registration, uniforms, books, others –*pendaftaran, seragam sekolah dan olah raga, buku, lainnya*) were most likely to be one-time expenditures and were thus kept as such.
- the same adjustments were also made to the 2000 figures except that the reported items were slightly different. Items which were doubled were:¹⁹ tuition (*SPP, BP3, Praktikum, iuran lainnya*), study material (*bahan belajar*), transportation (*transportasi*), extra-curricular activities (*kursus*). Items which were not changed were: registration, uniforms, books, stationary, other (*pendaftaran, pakaian sekolah, buku pelajar, alat tulis, lainnya*).

Data were aggregated by province. Unlike household weights in the *core* survey, which varied by kabupaten, weights in the *module* were uniform across kabupatens in the same province. That was dictated by the sample design. Table 3 shows the ratio of annual education expenditure in the *module* to that in the *core* surveys. The table suggests that when asked to report detailed education expenditure, households in Indonesia have tended to provide a level about 25% higher than the one they provide in answer to the single question on their total expenditure.

¹⁸ Given the unusually high inflation during the year, a further adjustment was necessary for annualizing the irregular expenditure in order not to overstate their amount for the year: the original adjustment factor (namely 2) was reduced by one third to take into account the fact that average inflation in the July-December period was one third higher than that of the first half of the year. Thus the result was that the relevant expenditures were multiplied by a factor of 1.5 instead of 2.

¹⁹ Unlike 1998, no further adjustment factors were introduced to that of doubling expenditure.

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Table 3
Ratio of Annual Education Expenditure in the Susenas *Module*
to that of the *Core*

Province	1995	1998	2000	Average
Aceh	1.38	1.22	1.55	1.38
Sumatera Utara	1.15	1.39	1.13	1.22
Sumatera Barat	1.21	1.62	1.35	1.39
Riau	1.06	1.06	0.91	1.01
Jambi	1.21	1.58	1.45	1.41
Sumatera Selatan	0.99	1.36	1.65	1.33
Bengkulu	1.17	1.03	1.42	1.21
Lampung	1.12	1.46	1.29	1.29
DKI. Jakarta	1.19	1.34	1.15	1.23
Jawa Barat	1.30	1.32	1.27	1.30
Jawa Tengah	1.17	1.34	1.41	1.31
DI. Yogyakarta	0.80	1.01	1.06	0.96
Jawa Timur	1.06	1.31	1.24	1.20
Bali	1.19	1.35	1.44	1.33
Nusa Tenggara Barat	1.10	1.67	1.65	1.47
Nusa Tenggara Timur	0.96	1.31	1.42	1.23
Kalimantan Barat	1.11	1.11	1.21	1.14
Kalimantan Tengah	1.03	1.44	0.99	1.15
Kalimantan Selatan	1.05	1.82	1.14	1.34
Kalimantan Timur	1.10	1.12	1.15	1.12
Sulawesi Utara	1.48	1.37	1.58	1.48
Sulawesi Tengah	1.12	1.01	1.17	1.10
Sulawesi Selatan	1.22	1.38	1.46	1.35
Sulawesi Tenggara	1.00	1.88	2.12	1.67
Maluku	1.13	1.16	2.63	1.64
Irian Jaya	1.44	1.18	1.44	1.35
Total	1.17	1.32	1.27	1.25

3. Health *Module*

Expenditures on education are expected to be incurred on a regular basis during a particular calendar year, so monthly figures on education can reasonably be annualized by multiplying them by a particular factor (as Table 1 shows, one factor that can be used for the country as a whole is 11.5). Expenditures on health, on the other hand, can be highly erratic and difficult to annualize: As Table 2 shows, the average reported health expenditures for the previous year have only been five times as high as those reported for the previous one month. Furthermore, respondents' recollection of unusual expenditures (such as hospitalization) in the previous month seems likely to be much more accurate than their recollection of unusual events

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during the entire preceding year. Thus while comparing annual (or annualized) expenditures in the case of education was, in our view, a better method than simply comparing monthly expenditures, the same is not true of expenditures on health. We believe that in the case of health, comparing reported monthly expenditure is more meaningful.

Thus the total monthly expenditure on health (for the January/February period) from the 1995, 1998 and 2001 *module* surveys were derived as follows:

- for 1995, it was the sum of the only two available variables in that questionnaire: Questions V.3 (outpatient care –*rawat jalan*) and V.6 (inpatient care –*rawat inap*) in the questionnaire in Appendix C.²⁰
- for 1998, it was computed as the sum of the following components (refer to the questionnaire in Appendix E for the exact wording of the questions):
 - a. Question V.2 (personal medicines –*mengobati sendiri*)
 - b. The sum of the column (2) values for Questions V.6.a through V.6.j (outpatient care –*berobat jalan*)
 - c. Question V.8 (regular consultations not related to a particular illness –*konsultasi/pemeriksaan kesehatan, kir kesehatan, periksa hamil, periksa bayi*)
 - d. One-twelfth of the sum of the column (3) values for Questions V.11.a through V.11.g (annual expenditure on inpatient care –*rawat inap dalam 12 bulan terakhir*).
- unlike in the previous health *module* surveys, the 2001 survey explicitly stated that the detailed questions corresponding to those asked in 1998 (namely questions V.C.21.d; column (4) of V.C.23.a through V.C.23.j; column (4) of V.C.25.a through V.C.25.g and V.C.27b) should include only those covered from the household's own sources. These numbers could not be used as benchmarks because they ignored the portion of expenditures

²⁰ Although the two questions clearly required reporting only on expenditures incurred from the household's own sources, our assessment was that reported responses likely referred to expenditures from all sources. When comparing response for the same households to the *core* question (which should include expenditures from all sources) and those to the *module* questions, the majority of respondents reported the same expenditure levels. The fact that the operational guidelines to the *module* left this issue vague lends support to our conclusion.

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coming from sources outside the household (which are covered in the *core*). Indeed, a comparison of these expenditures with those in the *core* survey suggests that they typically cover only about 60% of all health related expenditures. Therefore, for the purpose of benchmarking the 2001 expenditure level, we used the response to Question VII.20 (column 2), which covered health expenditures from all sources, not just from the household's own sources.²¹

Data were aggregated by province. Like household weights in the education *module*, those in the health *module* were uniform across kabupatens in the same province. Table 4 shows the ratio of monthly health expenditure in the *module* to that in the *core* survey for the January/February period. The table suggests that when asked to report detailed health expenditure, households in Indonesia have tended to provide a level about 18% higher than the one they provide in answer to the single question on their total health expenditure.

²¹ Figures for Aceh and Maluku, provinces excluded from the 2001 survey, were estimated using the average share of these expenditures for each province between 1995 and 1998.

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Table 4
Ratio of Monthly Expenditure on Health in the Susenas *Module*
to that of the *Core* (around January/February)¹⁾

Province	1995	1998	2001	Average
Aceh	1.67	1.75	2.23	1.88
Sumatera Utara	1.10	1.35	1.38	1.28
Sumatera Barat	1.53	1.43	1.10	1.35
Riau	1.16	0.97	0.75	0.96
Jambi	1.61	1.14	1.04	1.26
Sumatera Selatan	1.36	1.11	1.48	1.32
Bengkulu	1.74	0.93	0.41	1.03
Lampung	2.31	0.92	0.80	1.34
DKI. Jakarta	1.50	1.51	1.00	1.34
Jawa Barat	1.35	1.29	1.06	1.23
Jawa Tengah	0.80	1.14	0.94	0.96
DI. Yogyakarta	1.84	1.03	1.07	1.31
Jawa Timur	1.27	1.03	0.87	1.06
Bali	1.18	1.02	0.93	1.04
Nusa Tenggara Barat	1.45	1.12	0.91	1.16
Nusa Tenggara Timur	2.10	1.16	0.92	1.39
Kalimantan Barat	1.51	1.21	0.96	1.23
Kalimantan Tengah	2.63	1.74	1.34	1.90
Kalimantan Selatan	1.54	1.50	0.82	1.29
Kalimantan Timur	0.93	1.09	0.62	0.88
Sulawesi Utara	1.51	1.51	0.73	1.25
Sulawesi Tengah	2.18	1.17	0.94	1.43
Sulawesi Selatan	2.03	1.03	0.60	1.22
Sulawesi Tenggara	2.61	1.32	0.80	1.58
Maluku	1.92	1.23	1.34	1.50
Irian Jaya	2.71	1.02	1.15	1.63
Total	1.36	1.20	0.99	1.18

1) Expenditure refer to those incurred in the month prior to the interview. Given that the interviews for both surveys have taken place throughout the month of February of the relevant year, expenditure in the surveys refer roughly to the average monthly expenditure in the January/February period.

C. Benchmarking

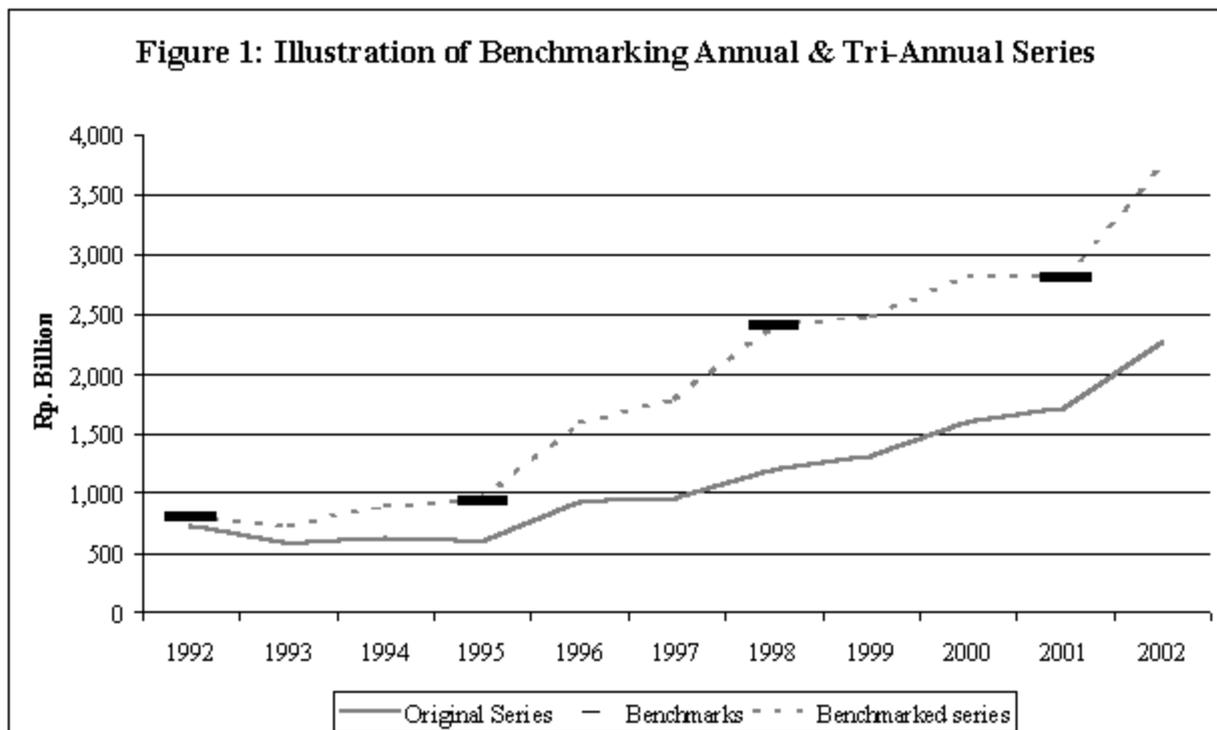
Benchmarking is a technique of combining data pertaining to the same variable from two sources of different frequencies: one, which is more frequent (e.g. the *core* survey in the case of Susenas) is believed to be less accurate (because of its less detailed questions), and the other, which is less frequent (e.g. the tri-annual *module* survey of Susenas) is believed to provide a more accurate level or *benchmark*. Stated very briefly, what benchmarking does is to create a new series that uses the tri-annual levels from the more reliable survey while preserving, as far as possible, the fluctuations from year to year in the annual series. A well-known benchmarking

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Benchmarking Susenas Health and Education Data

technique is the proportional Denton method which preserves to a maximum degree the fluctuations in the more frequent source data by minimizing the differences (in a least squares sense) between year-to-year percent change of the original and benchmarked series. This method is automated as a particular case of a program called BENCH developed and used by Statistics Canada.²²

Figure 1 provides an illustration of what the benchmarking technique does. Annual levels from the *core* survey (referred to as “original series”) are derived for 1992-2002. Tri-annual levels from the *module* are referred to as “benchmarks”. Finally, the new adjusted series (referred to as the “benchmarking series”), which uses the levels from the *module* for the years they are available, and year-to-year changes in-between in a pattern very close to that of the original series.



The benchmarking series in the graph clearly incorporates the levels of the four benchmarks. At the same time, it retains as much as possible the year-to-year fluctuations of the original series. Mathematically, it minimizes the squared differences between yearly percent changes in the original series and yearly percent changes in the benchmarking series, subject to the constraints of being equal to the levels of the four benchmarks.

²²

A manual produced by John Kuiper describes the basic methodology and operation of the program (*Operational Manual for Benchmarking Using the BENCH Program*, STAT Project Report #57, July, 2002).

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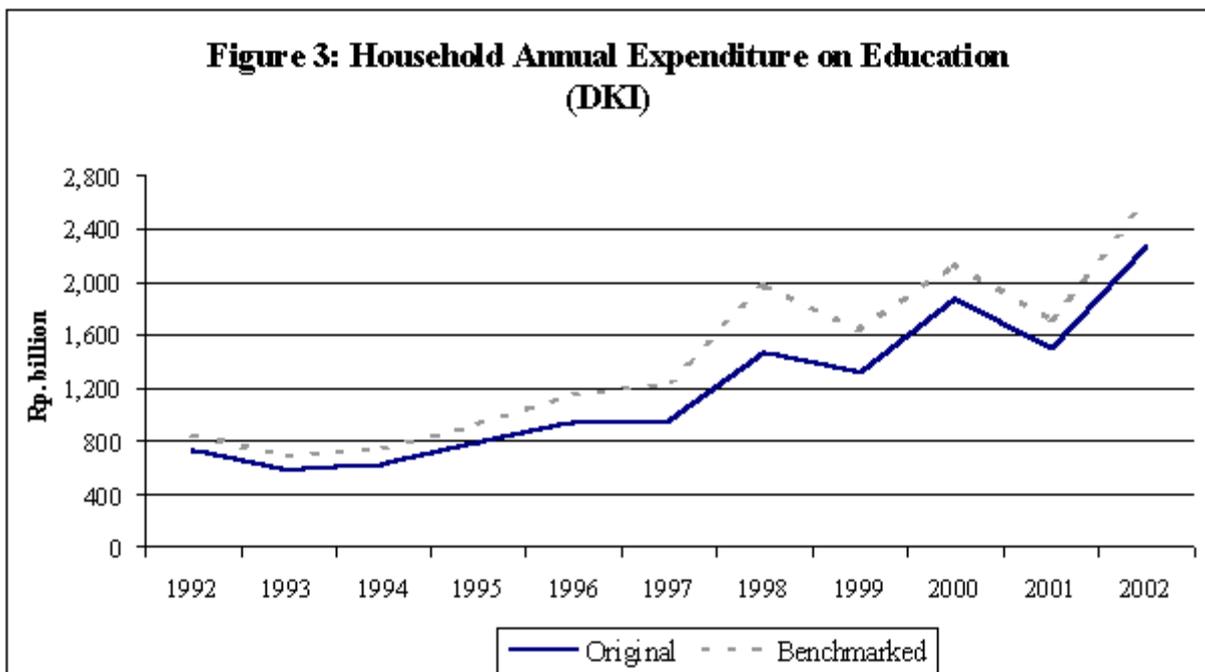
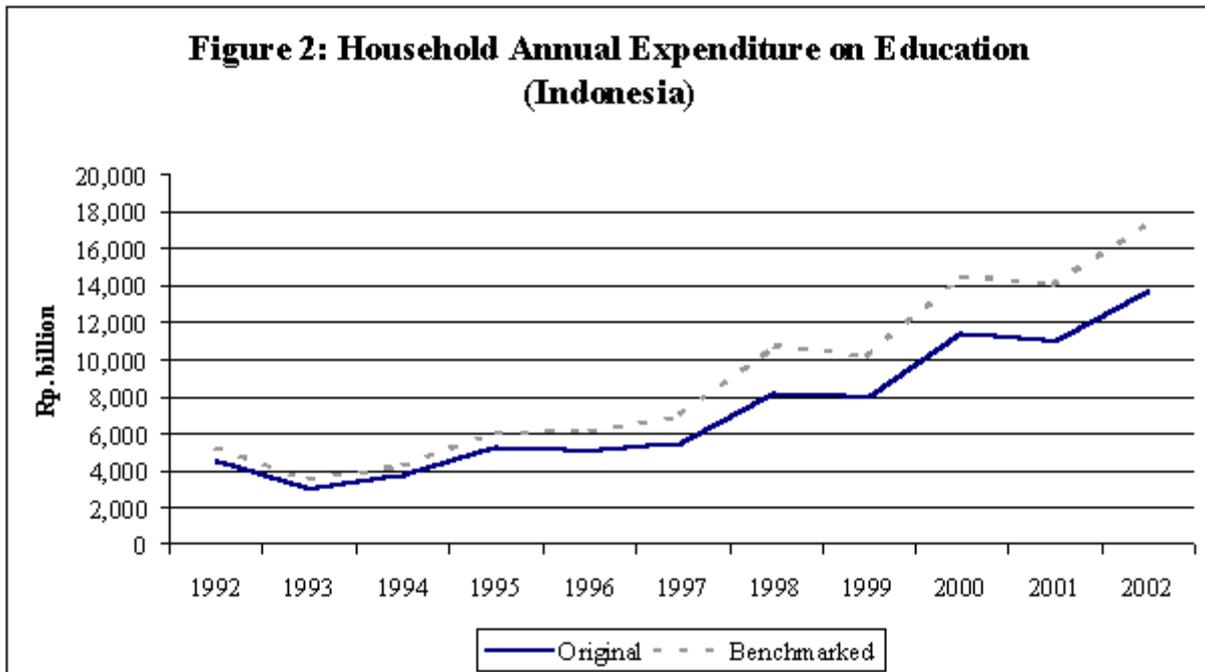
III. RESULTS

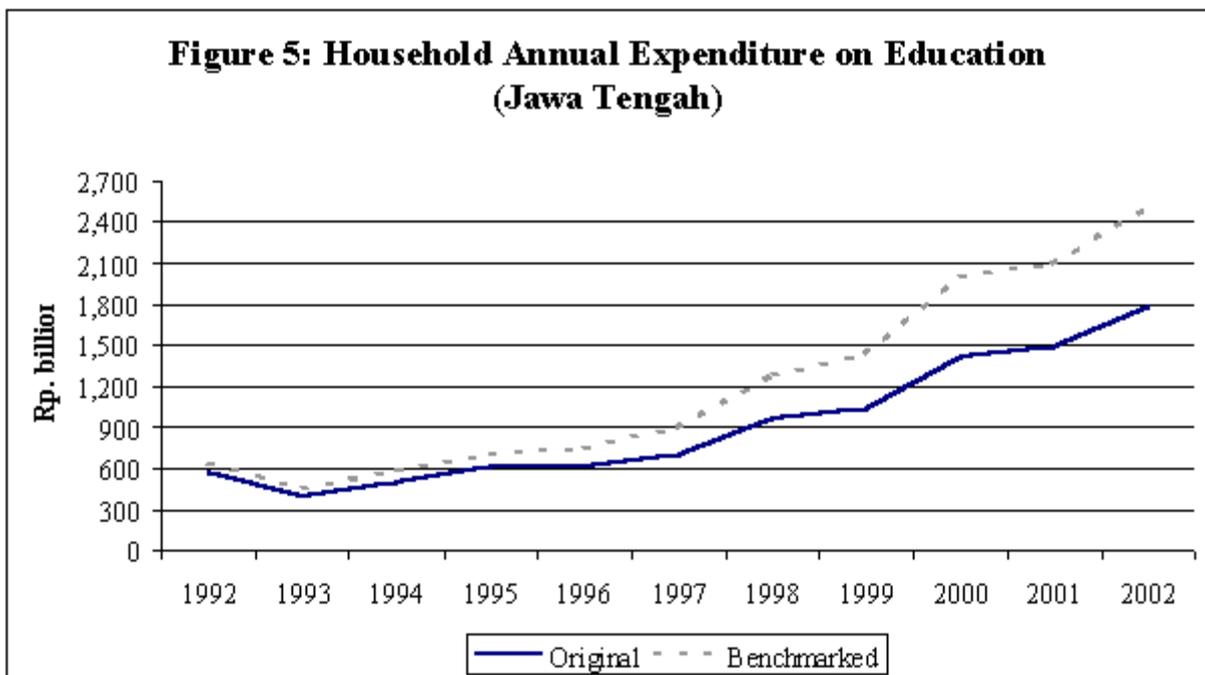
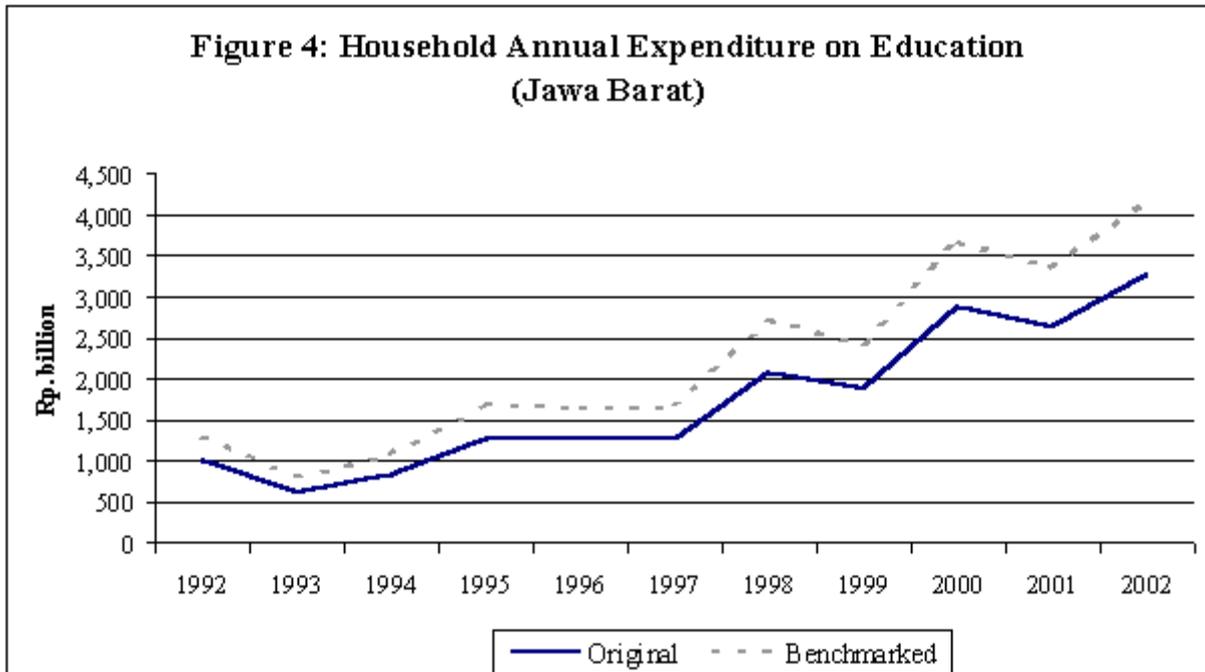
Since BPS has not yet published the data used in this report, we will present the results of the benchmarking exercise in graphic form. Figures 2 through 7 present results for benchmarking education expenditure for Indonesia and for some main provinces, and Figures 8 through 13 present those on health. Focusing on results for the country as a whole, nominal expenditure on education appear to have grown almost stepwise since 1993 (with spurts in 1995, 1998, 2000 and 2002), whereas nominal expenditure on health have witnessed a more or less continuous rise before falling in 2002.²³

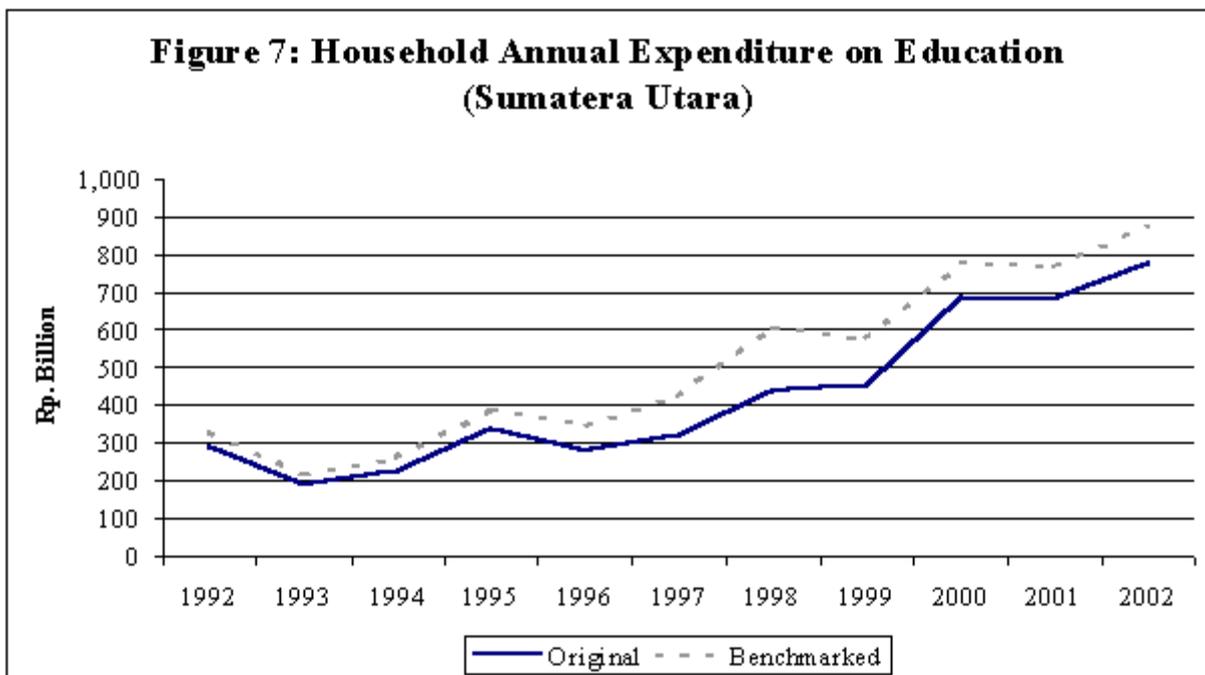
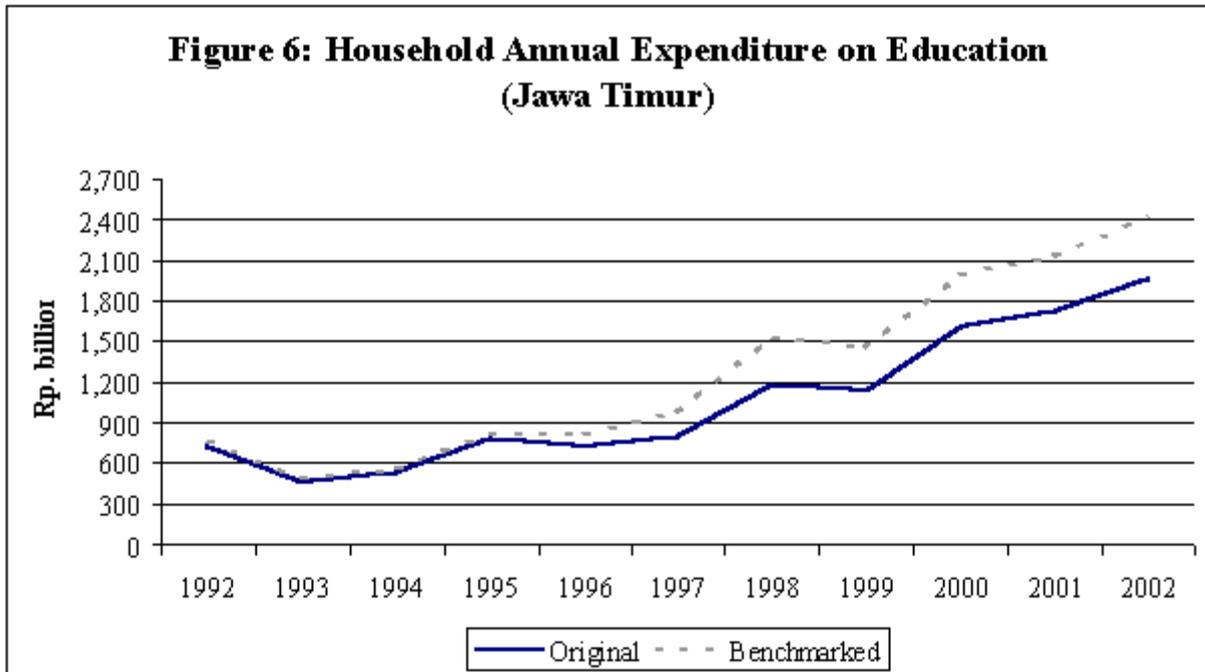
²³ The levels of annual expenditures on education used in the graphs represent about 4% of total household consumption expenditure (derived from the Susenas Income and Expenditure *module* surveys), and those of annualized health expenditure (i.e. monthly expenditure used in the graphs multiplied by 5) represent about 2% of total household consumption expenditure.

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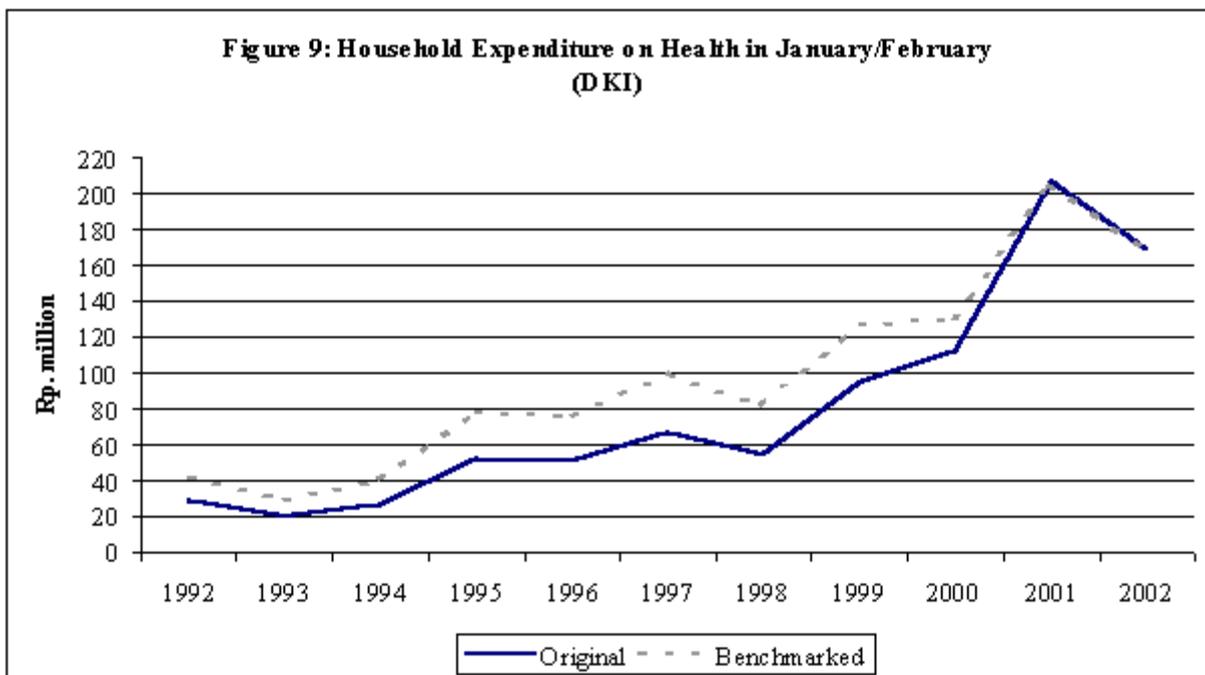
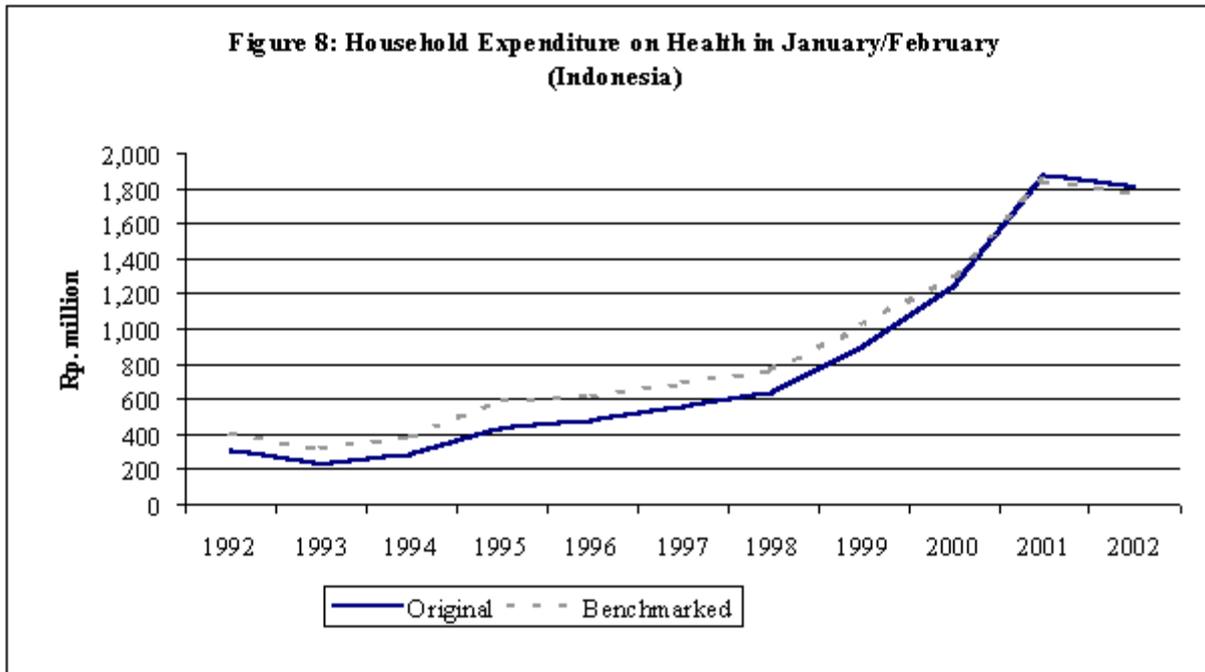






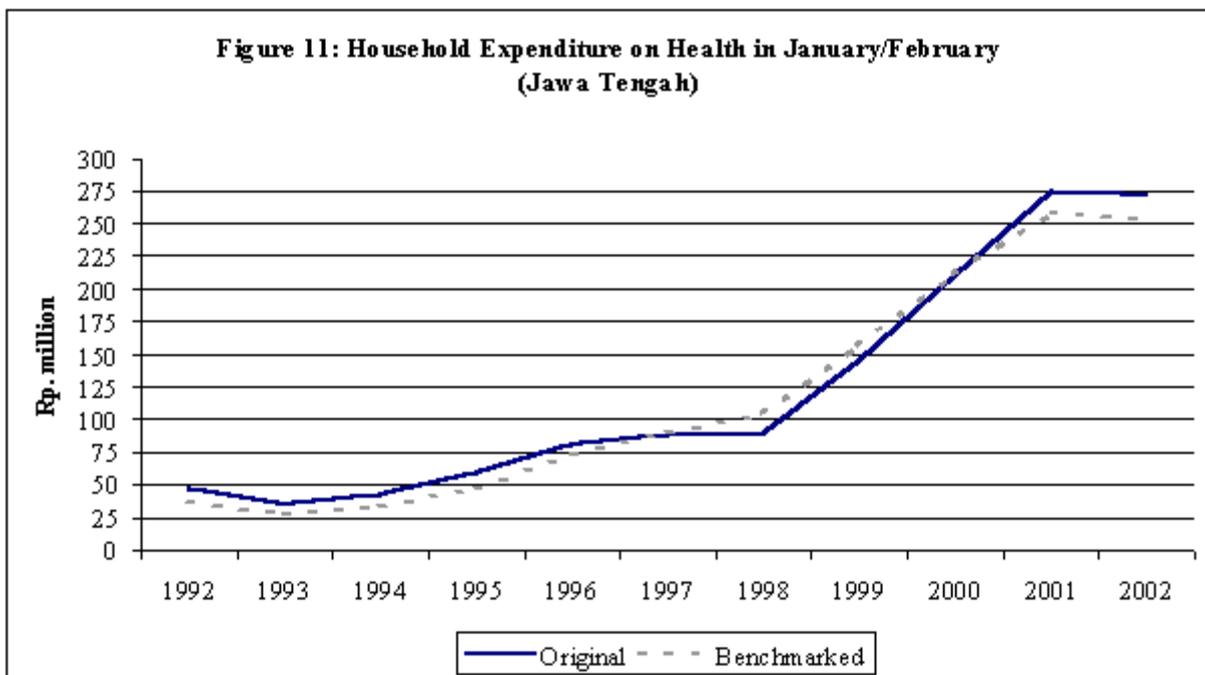
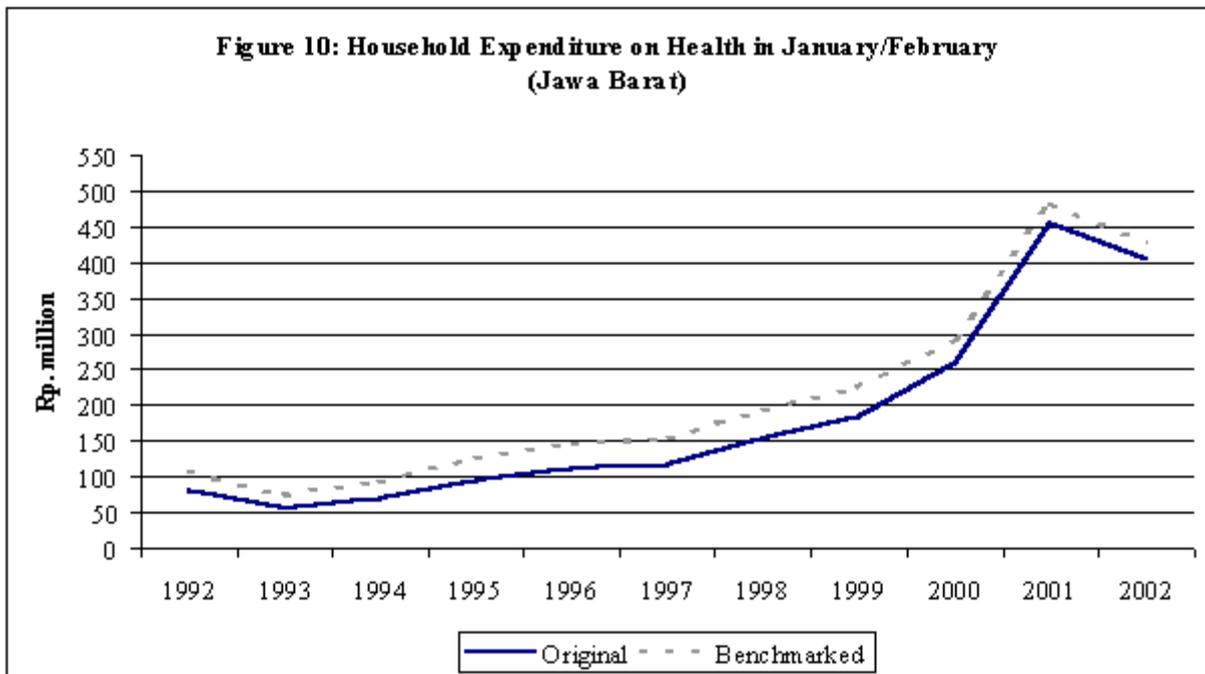
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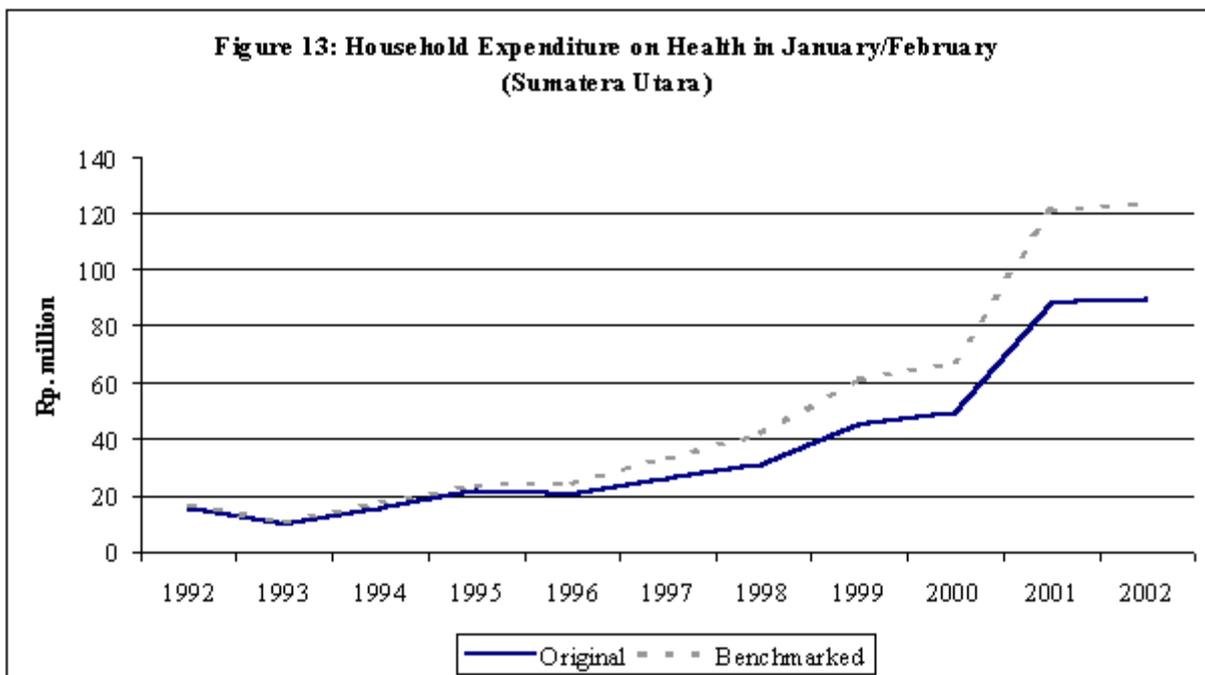
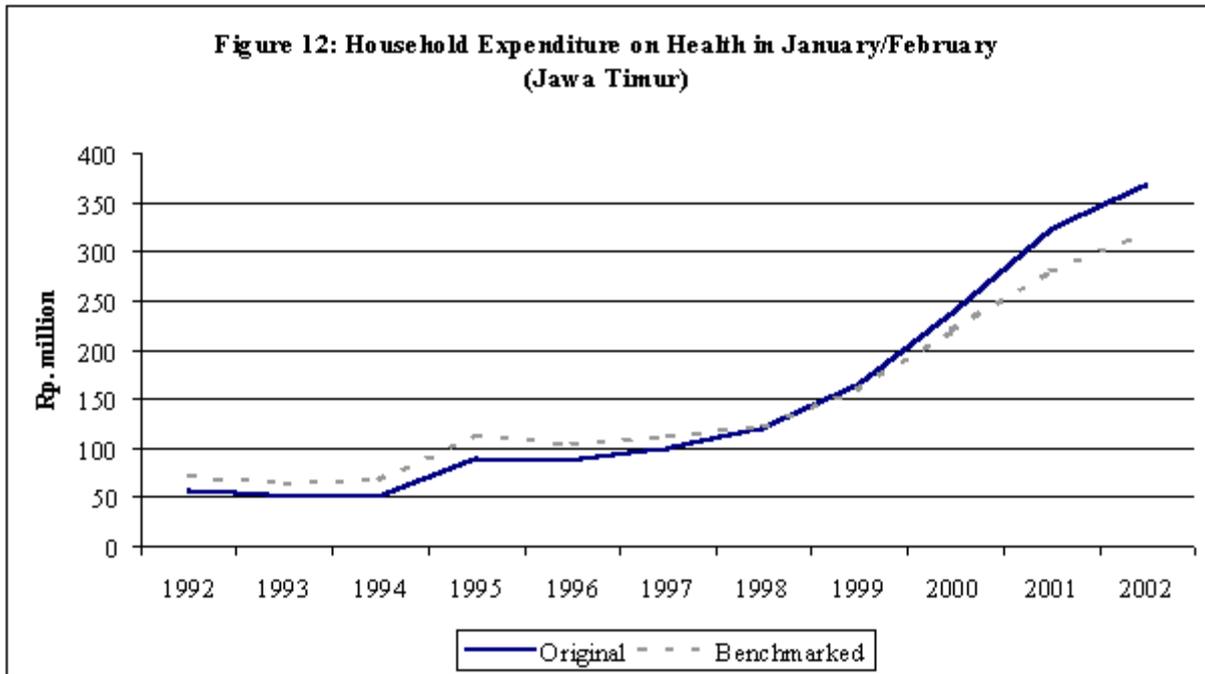
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IV. CONCLUSION & RECOMMENDATIONS

The above results suggest the following conclusion: data on education and health expenditure levels in Susenas, both at the provincial and national levels, appear plausible and may provide valuable insight to users interested in more than just shares of these expenditures by income group, as is currently published by BPS. The benchmarking methodology undertaken in this report, which allowed combining the strengths of the two data sources (namely the *core* and *module* surveys) into a single data series, carried one further substantial benefit: by highlighting data gaps in particular series, which needed to be corrected, it helped BPS identify potential sources of data problems to avoid in future surveys, thus increasing confidence in these data.

We believe that users, whether policy makers or researchers, interested in rupiah expenditure levels would welcome a regular BPS publication showing how these expenditures are progressing from year to year under changing economic conditions. Our strong recommendation, therefore, is for BPS to:

- Make available to users, in a separate publication similar to that done for Industry in 2001, an annual benchmarked series of household levels of expenditure on education and health for their evaluation.
- If user feedback is positive, then BPS should be ready to replicate the benchmarking of these variables regularly and provide them in the annual Susenas publication.
- Meantime, it would be useful if BPS began examining other types of expenditures in Susenas to evaluate the possibility of applying the methodology used in this report. Results can then also be shared with users for their feedback.
- Finally, it may also be useful for BPS to take steps which would help in assessing quantitatively whether data from the *module* surveys provide more accurate levels than those from the *core* surveys, particularly if such data will be regularly published. That may help increase confidence that benchmarking as attempted in this report, namely by using the *module* levels as benchmarks, has an empirical, rather than a judgmental, basis.

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APPENDIX A
A TYPICAL QUESTIONNAIRE FOR THE *CORE* SURVEY

This appendix provides only relevant parts of the questionnaire of the 2002 Susenas *Core* survey: the household characteristics section and that covering household expenditures on education and health. These questions have generally been the same in other years.

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SUSENAS **VSEN2002.K**

REPUBLIK INDONESIA
BADAN PUSAT STATISTIK

SURVEI SOSIAL EKONOMI NASIONAL 2002

KETERANGAN POKOK RUMAH TANGGA DAN ANGGOTA RUMAH TANGGA

Rahasia

I. PENGENALAN TEMPAT			
1	Propinsi		
2	Kabupaten/kota*)		
3	Kecamatan		
4	Desa/kelurahan*)		
5	Klasifikasi desa/kelurahan	1. Perkotaan 2. Perdesaan	
6	Nomor blok sensus		
7	Nomor kode sampel		
8	Nomor urut sampel rumah tangga		

II. KETERANGAN RUMAH TANGGA			
1	Nama kepala rumah tangga (krt):	4	Banyaknya anak usia 0-4 tahun:
2	Suku bangsa krt: <input type="text"/>	5	Banyaknya art yang meninggal dalam setahun yang lalu:
3	Banyaknya anggota rumah tangga (art): <input type="text"/>	6	Banyaknya art yang lahir dalam setahun yang lalu:

III. KETERANGAN PENCACAHAN			
1	Nama dan NIP pencacah: <input type="text"/>	5	Nama dan NIP pengawas/pemeriksa: <input type="text"/>
2	Jabatan pencacah: 1. Staf BPS Propinsi 3. Mantri 2. Staf BPS Kab/Kota 4. Mitra	6	Jabatan pengawas/pemeriksa: 1. Staf BPS Propinsi 3. Mantri 2. Staf BPS Kab/Kota 4. Mitra
3	Tanggal pencacahan: Tanggal Bulan <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	7	Tanggal pengawasan/pemeriksaan: Tanggal Bulan <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
4	Tanda tangan pencacah:	8	Tanda tangan pengawas/pemeriksa:

*) Coret yang tidak perlu

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VII. PENGELUARAN RUMAH TANGGA (LANJUTAN)		
VII.B. PENGELUARAN BUKAN MAKANAN (BERASAL DARI PEMBELIAN, PRODUKSI SENDIRI DAN PEMBERIAN)	Sebulan yang Lalu (Rp)	12 bulan yang Lalu (Rp)
(1)	(2)	(3)
17. Perumahan dan fasilitas rumah tangga a. Sewa, perkiraan sewa rumah sendiri, bebas sewa, dinas, kontrak, dll b. Rekening listrik, rekening telepon, gas, minyak tanah, air, kayu bakar, dll c. Pemeliharaan rumah dan perbaikan ringan		
18. Aneka barang dan jasa (sabun mandi, kecantikan, pengangkutan, bucuas, pembuatan KTP/SIM, rekreasi, kartu telepon, benda pos, dan lainnya)		
19. Biaya pendidikan (uang pendaftaran, SPP, POMG/BP3, uang pangkal/daftar ulang, pramuka, prakarya, kursus, dan lainnya)		
20. Biaya kesehatan (rumah sakit, puskesmas, dokter praktik, dukun, obat-obatan, dan lainnya)		
21. Pakaian, alas kaki, dan tutup kepala (bahan pakaian, pakaian jadi, sepatu, topi, sabun cuci, dan lainnya)		
22. Barang tahan lama (alat rumah tangga, perkakas, alat dapur, alat hiburan (elektronik), alat olahraga, perhiasan mahal/imitasi, kendaraan, payung, arloji, kamera, pasang telepon, pasang listrik, barang elektronik, dll.)		
23. Pajak dan asuransi a. Pajak (PBB, urusi TV, pajak kendaraan) b. Asuransi (asuransi kecelakaan, asuransi kesehatan)		
24. Keperluan pesta dan upacara (perkawinan, khitanan, ulang tahun, perayaan hari agama, upacara adat, dan lainnya)		
25. Jumlah bukan makanan (Rincian 17 s.d. Rincian 24)		
26. Rata-rata pengeluaran makanan sebulan (Rincian 16 x $\frac{30}{7}$)		
27. Rata-rata pengeluaran bukan makanan sebulan (Rincian 25 Kolom 3) 12		
28. Rata-rata pengeluaran rumah tangga sebulan (Rincian 26 + Rincian 27)		
29. Sumber penghasilan utama rumah tangga: (Tulis selengkap-lengkap nya) Isikan kode lapangan usaha/penerima pendapatan dan status pekerjaan sesuai sumber penghasilan utama rumah tangga dalam kotak. Tiga digit pertama untuk kode lapangan usaha/penerima pendapatan dan satu digit terakhir untuk kode status pekerjaan Kode status pekerjaan: 1. Buruh/karyawan 2. Pengusaha		diisi Editor <input type="text"/>

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APPENDIX B
QUESTIONNAIRE FOR THE 1992 *MODULE* SURVEY

This appendix provides only relevant parts of the questionnaire of the 1992 Susenas *Module* survey: the household characteristics section and those covering household expenditures on education and health.

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APPENDIX C
QUESTIONNAIRE FOR THE 1995 *MODULE* SURVEY

This appendix provides only relevant parts of the questionnaire of the 1995 Susenas *Module* survey: the household characteristics section and those covering household expenditures on education and health.

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SUSENAS **VSEN95.M**

**REPUBLIK INDONESIA
BIRO PUSAT STATISTIK**

SURVEI SOSIAL EKONOMI NASIONAL 1995

**KETERANGAN KESEHATAN, PENDIDIKAN, DAN
PERUMAHAN & PERMUKIMAN**

Rahasia

I. PENGENALAN TEMPAT			
01	Provinsi		□ □
02	Kabupaten/kotamadya *)		□ □
03	Kecamatan		□ □ □
04	Desa/kelurahan *)		□ □ □
05	D a e r a h	Perkotaan 1 Perdesaan 2	□
06	Nomor wilayah pencacahan		
07	Nomor kelompok segmen		
08	Nomor segmen		
09	Nomor kode sampel Susenas		□ □ □ □ □
10	Nomor urut rumah tangga sampel		□ □
11	Klasifikasi desa	diisi Editor <input type="checkbox"/>	Kode Pengolahan
			diisi BPS <input type="checkbox"/>
II. KETERANGAN RUMAH TANGGA			
01	Nama kepala rumah tangga:	03	Banyaknya anak usia 0-4 tahun: □ □
02	Jumlah anggota rumah tangga: □ □	04	Banyaknya art berumur 5-39 tahun yang bersekolah: □ □
III. KETERANGAN PENCACAHAN			
01	Nama dan NIP/NMS pencacah: □ □ □ □ □	05	Nama dan NIP/NMS pengawas/pemeriksa: □ □ □ □ □
02	Jabatan pencacah: Staf KS Propinsi 1 Mantis 3 □ Staf KS Kab/Kodya 2 Mitra 4	06	Jabatan pengawas/pemeriksa: Staf KS Propinsi 1 Mantis 3 □ Staf KS Kab/Kodya 2 Mitra 4
03	Tanggal pencacahan:	07	Tanggal pengawasan/pemeriksaan:
04	Tanda tangan pencacah:	08	Tanda tangan pengawas/pemeriksa:

*) Coret yang tidak perlu

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V. KETERANGAN KESEHATAN ANGGOTA RUMAHTANGGA																					
Nama:		No.urut:																			
1. Pernah berobat/rawat jalan dalam 1 bulan terakhir? (Cek pada Kor Blok V R.7 Kol.2) Ya 1 Tidak 2 (ke R.4)		8. Apakah penyebab gangguan/kecacatan tab.7																			
2. Sumber biaya pengobatan/rawat jalan? Ya 1 Tidak 2		<table style="width:100%; border: none;"> <tr> <td style="border: none;">Kecelakaan:</td> <td style="border: none;">Penyakit</td> <td style="border: none;">6</td> </tr> <tr> <td style="border: none;"> 1. Dalam rumah</td> <td style="border: none;"> 2. Sejak lahir</td> <td style="border: none;">7</td> </tr> <tr> <td style="border: none;"> 2. Lalu lintas</td> <td style="border: none;"> 3. Kriminalitas</td> <td style="border: none;">8</td> </tr> <tr> <td style="border: none;"> 3. Pabrik</td> <td style="border: none;"> 4. Bencana alam</td> <td style="border: none;">9</td> </tr> <tr> <td style="border: none;"> 4. Konstruksi</td> <td style="border: none;"> 5. Lainnya</td> <td style="border: none;">0</td> </tr> <tr> <td style="border: none;"> 5. Tempat lain</td> <td></td> <td></td> </tr> </table>		Kecelakaan:	Penyakit	6	1. Dalam rumah	2. Sejak lahir	7	2. Lalu lintas	3. Kriminalitas	8	3. Pabrik	4. Bencana alam	9	4. Konstruksi	5. Lainnya	0	5. Tempat lain		
Kecelakaan:	Penyakit	6																			
1. Dalam rumah	2. Sejak lahir	7																			
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3. Pabrik	4. Bencana alam	9																			
4. Konstruksi	5. Lainnya	0																			
5. Tempat lain																					
<table style="width:100%; border: none;"> <tr> <td style="border: none;">a. Rumah tangga</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">d. Perusahaan/ kantor</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">b. Askes</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">e. Jasa Raharja</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">c. Astek</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">f. Pihak lain</td> <td style="border: none;"><input type="checkbox"/></td> </tr> </table>		a. Rumah tangga	<input type="checkbox"/>	d. Perusahaan/ kantor	<input type="checkbox"/>	b. Askes	<input type="checkbox"/>	e. Jasa Raharja	<input type="checkbox"/>	c. Astek	<input type="checkbox"/>	f. Pihak lain	<input type="checkbox"/>	9. Apakah memakai alat bantu? Ya 1 Tidak 2							
a. Rumah tangga	<input type="checkbox"/>	d. Perusahaan/ kantor	<input type="checkbox"/>																		
b. Askes	<input type="checkbox"/>	e. Jasa Raharja	<input type="checkbox"/>																		
c. Astek	<input type="checkbox"/>	f. Pihak lain	<input type="checkbox"/>																		
3. Bila R.2a berkode 1, biaya yang dikeluarkan rumah tangga (Rp.)		10. Apakah minum/wesakai jamu/obat tradisional dalam 1 bulan terakhir? Ya 1 Tidak 2 (ke R.13)																			
4. Pernah rawat inap dalam 1 bulan terakhir? (Cek pada Kor Blok V R.7 Kol.3) Ya 1 Tidak 2 (ke R.7)		11. Kalau Ya, buatan siapa? (Jumlahkan kode bila lebih dari satu)																			
5. Sumber biaya pengobatan/rawat inap? Ya 1 Tidak 2		<table style="width:100%; border: none;"> <tr> <td style="border: none;">Sendiri</td> <td style="border: none;">1</td> <td style="border: none;">Penjaja jamu</td> <td style="border: none;">1</td> </tr> <tr> <td style="border: none;">Pabrik</td> <td style="border: none;">2</td> <td style="border: none;">gendong/obat</td> <td style="border: none;">2</td> </tr> <tr> <td style="border: none;">Orang lain</td> <td style="border: none;">4</td> <td style="border: none;">tradisional</td> <td style="border: none;">8</td> </tr> </table>		Sendiri	1	Penjaja jamu	1	Pabrik	2	gendong/obat	2	Orang lain	4	tradisional	8						
Sendiri	1	Penjaja jamu	1																		
Pabrik	2	gendong/obat	2																		
Orang lain	4	tradisional	8																		
6. Bila R.5a berkode 1, biaya rawat inap yang dikeluarkan rumah tangga (Rp.)		12. Untuk apa jamu/obat tradisional tersebut diminum/dipakai? (Jumlahkan kode bila lebih dari satu)																			
7. Apakah mengalami gangguan/kesulitan/kecacatan?		<table style="width:100%; border: none;"> <tr> <td style="border: none;">Pengobatan</td> <td style="border: none;">1</td> <td style="border: none;">Pemeliharaan</td> <td style="border: none;">1</td> </tr> <tr> <td style="border: none;">Peluntur</td> <td style="border: none;">2</td> <td style="border: none;">kesehatan</td> <td style="border: none;">8</td> </tr> <tr> <td style="border: none;">Seks</td> <td style="border: none;">4</td> <td style="border: none;">lainnya</td> <td style="border: none;">16</td> </tr> </table>		Pengobatan	1	Pemeliharaan	1	Peluntur	2	kesehatan	8	Seks	4	lainnya	16						
Pengobatan	1	Pemeliharaan	1																		
Peluntur	2	kesehatan	8																		
Seks	4	lainnya	16																		
<table style="width:100%; border: none;"> <tr> <td style="border: none;">a. Rumah tangga</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">d. Perusahaan/ kantor</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">b. Askes</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">e. Jasa Raharja</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">c. Astek</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">f. Pihak lain</td> <td style="border: none;"><input type="checkbox"/></td> </tr> </table>		a. Rumah tangga	<input type="checkbox"/>	d. Perusahaan/ kantor	<input type="checkbox"/>	b. Askes	<input type="checkbox"/>	e. Jasa Raharja	<input type="checkbox"/>	c. Astek	<input type="checkbox"/>	f. Pihak lain	<input type="checkbox"/>	HANYA UNTUK UMUR 0-4 TAHUN							
a. Rumah tangga	<input type="checkbox"/>	d. Perusahaan/ kantor	<input type="checkbox"/>																		
b. Askes	<input type="checkbox"/>	e. Jasa Raharja	<input type="checkbox"/>																		
c. Astek	<input type="checkbox"/>	f. Pihak lain	<input type="checkbox"/>																		
13. Berat badan balita: kg																					
14. Apakah mempunyai kebiasaan menggosok gigi setiap hari?																					
Ya, sesudah makan 1		Ya, sesudah bangun tidur 4																			
Ya, sebelum tidur 2		Ya, lainnya 8																			
		Tidak 00																			
15. Apakah memeriksakan gigi ke dokter gigi/perawat gigi dalam 6 bulan terakhir? Ya 1 Tidak 2 (ke R.17)																					
16. Untuk apa tujuan ke dokter gigi/perawat gigi tersebut?																					
Berobat karena sakit gigi 1		Pemeriksaan/ check up saja 4																			
Pasang gigi palsu 2		Lainnya 8																			
HANYA UNTUK UMUR 5 TAHUN KE ATAS																					
17. Apakah mengalami kesulitan/memerlukan bantuan orang lain dalam melakukan kegiatan sehari-hari berikut?																					
Tidak ada 1		Dengan bantuan 3																			
Agak sulit tetapi belum memerlukan bantuan 2		Dengan bantuan sepenuhnya 4																			
<table style="width:100%; border: none;"> <tr> <td style="border: none;">a. Bangun/berbaring</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">e. Mandi</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">b. Duduk/berdiri</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">f. Berpakaian</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">c. Berjalan</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">g. Makan</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">d. Buang air</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">h. Bermain/sekolah/kegiatan sosial</td> <td style="border: none;"><input type="checkbox"/></td> </tr> </table>		a. Bangun/berbaring	<input type="checkbox"/>	e. Mandi	<input type="checkbox"/>	b. Duduk/berdiri	<input type="checkbox"/>	f. Berpakaian	<input type="checkbox"/>	c. Berjalan	<input type="checkbox"/>	g. Makan	<input type="checkbox"/>	d. Buang air	<input type="checkbox"/>	h. Bermain/sekolah/kegiatan sosial	<input type="checkbox"/>				
a. Bangun/berbaring	<input type="checkbox"/>	e. Mandi	<input type="checkbox"/>																		
b. Duduk/berdiri	<input type="checkbox"/>	f. Berpakaian	<input type="checkbox"/>																		
c. Berjalan	<input type="checkbox"/>	g. Makan	<input type="checkbox"/>																		
d. Buang air	<input type="checkbox"/>	h. Bermain/sekolah/kegiatan sosial	<input type="checkbox"/>																		
(i) Tidak ada 1 Sedang 3 Sangat 5 Ringan 2 Berat 4 berat 5																					
<table style="width:100%; border: none;"> <tr> <td style="border: none;">a. Penglihatan</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">d. Rasa raba</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">b. Pendengaran</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">e. Kejang/ayan</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">c. Bicara</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">f. Belajar/ terbelakang</td> <td style="border: none;"><input type="checkbox"/></td> </tr> </table>		a. Penglihatan	<input type="checkbox"/>	d. Rasa raba	<input type="checkbox"/>	b. Pendengaran	<input type="checkbox"/>	e. Kejang/ayan	<input type="checkbox"/>	c. Bicara	<input type="checkbox"/>	f. Belajar/ terbelakang	<input type="checkbox"/>								
a. Penglihatan	<input type="checkbox"/>	d. Rasa raba	<input type="checkbox"/>																		
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c. Bicara	<input type="checkbox"/>	f. Belajar/ terbelakang	<input type="checkbox"/>																		
(ii) Tidak ada gangguan 1 Ada gangguan 2																					
<table style="width:100%; border: none;"> <tr> <td style="border: none;">g. Perilaku/jiwa</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">i. Sendi</td> <td style="border: none;"><input type="checkbox"/></td> </tr> <tr> <td style="border: none;">h. Pikun</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">j. Kelumpuhan</td> <td style="border: none;"><input type="checkbox"/></td> </tr> </table>		g. Perilaku/jiwa	<input type="checkbox"/>	i. Sendi	<input type="checkbox"/>	h. Pikun	<input type="checkbox"/>	j. Kelumpuhan	<input type="checkbox"/>												
g. Perilaku/jiwa	<input type="checkbox"/>	i. Sendi	<input type="checkbox"/>																		
h. Pikun	<input type="checkbox"/>	j. Kelumpuhan	<input type="checkbox"/>																		
(iii) Lengkap 1 Tidak lengkap 2																					
<table style="width:100%; border: none;"> <tr> <td style="border: none;">k. Anggota atas</td> <td style="border: none;"><input type="checkbox"/></td> <td style="border: none;">l. Anggota bawah</td> <td style="border: none;"><input type="checkbox"/></td> </tr> </table>		k. Anggota atas	<input type="checkbox"/>	l. Anggota bawah	<input type="checkbox"/>																
k. Anggota atas	<input type="checkbox"/>	l. Anggota bawah	<input type="checkbox"/>																		
(Bila tidak ada gangguan/kesulitan/kecacatan, langsung ke R.10)																					

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HANYA UNTUK UMUR 10 TAHUN KE ATAS			
18. Apakah mengalami kesulitan dalam melakukan kegiatan sehari-hari berikut ini? Mudah 1 Sukar 2 Tidak bisa 3		30. Klasifikasi jenis olahraga: Ringan (jalan kaki, bilyar) 1 Sedang (voli, pingpong, SKJ) 2 Agak berat (sepeda gunung, lari santai) 3 Berat (tennis, badminton, sepak bola) 4 Sangat berat (dayung, basket, angkat besi) 5	
a. Mengambil makanan untuk sendiri	<input type="checkbox"/>	d. Berpakaian sendiri	<input type="checkbox"/>
b. Pekerjaan rumah tangga ringan	<input type="checkbox"/>	e. Pekerjaan rumah tangga berat	<input type="checkbox"/>
c. Membeli barang/belanja	<input type="checkbox"/>	31. Pekerjaan/aktivitas fisik responden sehari-hari tergolong: Ringan 1 Sedang 2 Berat 3	
19. Sudah berapa lama gangguan/kesulitan di R.17 atau R.18 berlangsung? bulan		UNTUK SELURUH ART YANG BERUMUR 15 TAHUN KE ATAS	
20. Apakah merokok dalam 1 bulan terakhir? Ya, tiap hari 1 Ya, kadang-kadang 2 → (ke R.23) Tidak merokok 3		32. Apakah pernah mengemudi/dibonceng sepeda motor di jalan umum dalam 12 bulan terakhir? Ya 1 Tidak 2 (ke R.34)	
21. Apakah sebelumnya merokok? Ya, tiap hari 1 Ya, kadang-kadang 2 Tidak merokok 3 → (ke R.27)		33. Bila R.32 = 1, apakah memakai helm? Selalu 1 Kadang-kadang 3 Sering 2 Tidak pernah 4	
22. Sudah berapa lama berhenti merokok? bulan		34. Jumlah saudara wanita yang seibu yang pernah kawin (termasuk yang sudah meninggal):	
23. Berapa batang rokok yang biasa dihisap tiap hari? batang		35. Jumlah saudara wanita yang seibu yang pernah kawin yang masih hidup:	
24. Jenis rokok yang biasa dihisap? Putih filter 1 Cerutu 5 Putih nonfilter 2 Linting 6 Kretek filter 3 Siong 7 Kretek nonfilter 4 Cangklong 8		36. Jumlah saudara wanita yang seibu yang pernah kawin yang sudah meninggal:	
25. Apakah merokok ketika sedang berada di dalam rumah sendiri? Ya 1 Tidak 2		37. Bila R.36 ada isian, berapa orang yang meninggal waktu hamil, melahirkan atau dalam 40 hari sesudah akhir kehamilan:	
26. Pada usia berapa mulai merokok? tahun		38. Nama yang meninggal di R.37	
27. Apakah melakukan olah raga dalam 3 bulan terakhir? Ya 1 Tidak 2 (ke R.31)		39. Bulan dan tahun meninggal	
28. Berapa kali rata-rata dilakukan: 1-2 kali 1-2 kali/minggu 3 dalam 3 bulan 1 3-5 kali/minggu 4 1-2 kali/bulan 2 (6-7 kali/minggu) 5		40. Tempat meninggal: RS Swasta 1 RS Pemerintah 2 Klinik/Puskesmas 3 Rumah 4 Di jalan 5 lainnya 6 Tidak tahu 7	
29. Berapa lama rata-rata: < 10 menit 1 20-29 menit 3 10-19 menit 2 ≥ 30 menit 4		HANYA UNTUK UMUR 30 TAHUN KE ATAS	
		41. Apakah dalam 5 tahun terakhir pernah melakukan pemeriksaan kesehatan umum/general check-up (paling sedikit pemeriksaan fisik, darah, dan rontgen)? Ya 1 Tidak 2	

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VII. BIAYA PENDIDIKAN ANGGOTA RUMAH TANGGA BERUMUR 5-10 TAHUN YANG MASIH BERSEKOLAH											
Nama: No:		<input type="checkbox"/>	10. Ketersediaan buku wajib: (hanya untuk SD, SMP, SMA, dan sederajat). lengkap 1 Tdk lengkap 2 Tdk ada 3								
1. Terdaftar dan aktif di sekolah:		<input type="checkbox"/>	a. PMP <input type="checkbox"/> d. IPA <input type="checkbox"/> g. Fisika <input type="checkbox"/>								
S D 01 M. Aliyah 07 M. Ibtidaiyah 02 D2/PGSD 08 SMP Umum 03 Akademi/03 09 M. Tsanawiyah 04 S1/D4 10 SMA Umum 05 S2/S3 11 SMA Kejuruan 06 07 12		<input type="checkbox"/>	b. Bahasa Indonesia <input type="checkbox"/> e. IPS <input type="checkbox"/> h. Kimia <input type="checkbox"/> c. Matematika <input type="checkbox"/> f. Bahasa Inggris <input type="checkbox"/> i. Biologi <input type="checkbox"/>								
2. Jurusan pendidikan (Bila R.1- 12 ke R.6): (.....)		diisi BPS <input type="checkbox"/>	<table border="1"> <tr> <th rowspan="2">Jenis Pengeluaran</th> <th colspan="2">Biaya yang dikeluarkan</th> </tr> <tr> <th>Bulan terakhir (Rp)</th> <th>Selama satu tahun ajaran (000 Rp)</th> </tr> <tr> <td>(1)</td> <td>(2)</td> <td>(3)</td> </tr> </table>	Jenis Pengeluaran	Biaya yang dikeluarkan		Bulan terakhir (Rp)	Selama satu tahun ajaran (000 Rp)	(1)	(2)	(3)
Jenis Pengeluaran	Biaya yang dikeluarkan										
	Bulan terakhir (Rp)	Selama satu tahun ajaran (000 Rp)									
(1)	(2)	(3)									
3. Jarak terdekat yang biasa ditempuh dari tempat tinggal ke sekolah: km		<input type="checkbox"/>	I. Biaya Bersekolah (R11+R12+R13) 11. Pendaftaran (uang pangkal/gedung,daftar ulang) 12. Iuran-iuran (a+b+c+d) a. SPP b. POMG/SPS c. Praktikum/Ketrampilan d. Iuran lainnya (al.0515)								
4. Lama perjalanan dari tempat tinggal ke sekolah: menit		<input type="checkbox"/>	13. Evaluasi/Ujian								
5. Sarana pergi ke sekolah: Kendaraan bermotor yg dikuasai rt 1 Kendaraan tidak bermotor yang dikuasai rt 2 Kendaraan umum bermotor 3 Kendaraan umum tdk bermotor 4 Kendaraan orang lain gratis 5 Jalan kaki 6		<input type="checkbox"/>	II. Biaya peralatan & perlengkapan bersekolah (R14+R15+R16) 14. Bahan penunjang mata pelajaran 15. Seragam sekolah & olahraga 16. Buku, alat tulis dan perlengkapan bersekolah (a+b) a. Buku pelajaran/panduan/diktat b. Alat tulis dan perlengkapan lainnya								
6. Yang menanggung biaya tinggal/makan terbanyak: Orang tua 1 Orang lain 4 Saudara se ayah/ Sendiri 5 se Ibu 2 Pemerintah 6 Keluarga 3 Yayasan/lembaga 7		<input type="checkbox"/>	III. Transportasi dan kursus (R17+R18) 17. Transportasi (termasuk biaya antar jemput) 18. Kursus sehubungan dengan sekolah/kuliah								
7. Yang menanggung biaya bersekolah terbanyak: Orang tua 1 Orang lain 4 Saudara se ayah/ Sendiri 5 se Ibu 2 Pemerintah 6 Keluarga 3 Yayasan/lembaga 7		<input type="checkbox"/>	IV. Lainnya								
8. a. Belajar di luar jam sekolah? Ya 1 Tidak 2 (ke R.10)		<input type="checkbox"/>	TOTAL: (I+II+III+IV)								
b. Belajar berkelompok? Ya 1 Tidak 2		<input type="checkbox"/>									
c. Belajar dengan bantuan pembimbing? Ya 1 Tidak 2 (ke R.9)		<input type="checkbox"/>									
d. Membayar pembimbing? Ya 1 Tidak 2		<input type="checkbox"/>									
e. Yang sebiabing: Art 1 Teman sekolah 3 keluarga 2 Orang lain 4		<input type="checkbox"/>									
9. a. Tempat belajar di luar jam bersekolah: Di dalam rumah 1 Di luar rumah 2		<input type="checkbox"/>									
b. Rata-rata lama belajar di luar jam bersekolah per hari dalam seminggu: jam		<input type="checkbox"/>									

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APPENDIX D
EDUCATION QUESTIONNAIRE FOR THE 1998 *MODULE* SURVEY

This appendix provides only relevant parts of the education questionnaire of the 1998 Susenas *Module* survey: the household characteristics section and that covering household expenditures on education. Although this survey covered health as well as education, the health questionnaire was separated from that of other topics because it contained far more detailed questions than in the past.

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SUSENAS **VSEN98.MPP**

REPUBLIK INDONESIA
BIRO PUSAT STATISTIK

SURVEI SOSIAL EKONOMI NASIONAL 1998

KETERANGAN PENDIDIKAN, PERUMAHAN
DAN PERMUKIMAN

Rahasia

I. PENGENALAN TEMPAT			
01	Provinsi		
02	Kabupaten/kotamadya*)		
03	Kecamatan		
04	Desa/kelurahan*)		
05	D a e r a h	<i>Perkotaan 1 Pedesaan 2</i>	
06	Nomor wilayah pencacahan		
07	Nomor kelompok segmen		
08	Nomor segmen		
09	Nomor kode sampel		
10	Nomor urut rumah tangga sampel		
11	Klasifikasi desa	<i>Tertinggal 1 Tidak tertinggal 2</i>	diisi Editor

II. KETERANGAN RUMAH TANGGA			
01	Nama kepala rumah tangga:	03	Banyaknya art berumur 3-7 tahun yang berpartisipasi di TK/BA/RA
02	Banyaknya anggota rumah tangga	04	Banyaknya art berumur 5-39 tahun yang bersekolah:

III. KETERANGAN PENCACAHAN			
01	Nama dan NIP/NMS pencacah:	05	Nama dan NIP/NMS pengawas/pemeriksa:
02	Jabatan pencacah: <i>Staf KS Propinsi 1 Mantis 3 Staf KS Kab/Kod 2 Mitra 4</i>	06	Jabatan pengawas/pemeriksa: <i>Staf KS Propinsi 1 Mantis 3 Staf KS Kab/Kod 2 Mitra 4</i>
03	Tanggal pencacahan:	07	Tanggal pengawasan/pemeriksaan:
04	Tanda tangan pencacah:	08	Tanda tangan pengawas/pemeriksa:

*) Coret yang tidak perlu

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VI. BIAYA PENDIDIKAN ANGGOTA RUMAH TANGGA BERUMUR 5-39 TAHUN YANG MASIH BERSEKOLAH																																																												
Nama:		No. Urut:	<input type="text"/>																																																									
1. Terdaftar dan aktif di sekolah: SD 01 M. Aliyah 08 M. Ibtidaiyah 02 SMK 09 Paket A setara 03 Diploma I/II 10 SLTP Umum/ 04 Diploma III/SM 11 Kejuruan 04 Diploma IV/S 12 M. Tsanawiyah 05 S2 13 Paket B setara 06 S3 14 SMU 07 [Bila R.1=01 s.d 06, langsung ke R.3]		<input type="text"/>	9. a. Tempat belajar di luar jam bersekolah: Di dalam rumah 1 Di luar rumah 2 <input type="text"/> b. Rata-rata lama belajar di luar jam bersekolah per hari dalam seminggu: Jam <input type="text"/>																																																									
2. Bila R.1=07 s.d 14, jurusan pendidikan: ()		diisi Editor	10. Ketersediaan buku wajib pada empat wulan yang berjalan: Ada 1 Tidak ada 2 a. PMP <input type="checkbox"/> d. IPA <input type="checkbox"/> g. Fisika <input type="checkbox"/> b. Bahasa Indonesia <input type="checkbox"/> e. IPS <input type="checkbox"/> h. Kama <input type="checkbox"/> c. Matematika <input type="checkbox"/> f. Bahasa Inggris <input type="checkbox"/> i. Biologi <input type="checkbox"/>																																																									
3. a. Jarak terdekat yang biasa ditempuh dari tempat tinggal ke sekolah: Km <input type="text"/> b. Lama perjalanannya: Menit <input type="text"/>		<input type="text"/>	Biaya Pendidikan Anggota Rumah Tangga <table border="1"> <thead> <tr> <th>Jenis Pengeluaran</th> <th>Bulan terakhir (Rp)</th> <th>Selama Juli-Desember (000 Rp)</th> </tr> <tr> <th>(1)</th> <th>(2)</th> <th>(3)</th> </tr> </thead> <tbody> <tr> <td>11. Pendaftaran (uang pangkal/ gedung, daftar ulang)</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>12. Iuran-iuran (a + b + c + d)</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>a. SPP</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>b. POMG/BP3</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>c. Praktikum/ketrampilan</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>d. Iuran lainnya (spt. OSIS)</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>13. Evaluasi/ujian</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>14. Bahan penunjang mata pelajaran</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>15. Seragam sekolah dan olahraga</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>16. Buku, alat tulis dan perlengkapan bersekolah (a + b)</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>a. Buku pelajaran/panduan/ diktat</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>b. Alat tulis dan perlengkapan lainnya</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>17. Transportasi (termasuk biaya antar jemput)</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>18. Kursus sehubungan dengan sekolah/kuliah</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td>19. Lainnya</td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> <tr> <td colspan="2" style="text-align: center;">TOTAL</td> <td><input type="text"/></td> </tr> <tr> <td colspan="2" style="text-align: center;">(11+12+13+14+15+16+17+18+19)</td> <td></td> </tr> </tbody> </table>	Jenis Pengeluaran	Bulan terakhir (Rp)	Selama Juli-Desember (000 Rp)	(1)	(2)	(3)	11. Pendaftaran (uang pangkal/ gedung, daftar ulang)	<input type="text"/>	<input type="text"/>	12. Iuran-iuran (a + b + c + d)	<input type="text"/>	<input type="text"/>	a. SPP	<input type="text"/>	<input type="text"/>	b. POMG/BP3	<input type="text"/>	<input type="text"/>	c. Praktikum/ketrampilan	<input type="text"/>	<input type="text"/>	d. Iuran lainnya (spt. OSIS)	<input type="text"/>	<input type="text"/>	13. Evaluasi/ujian	<input type="text"/>	<input type="text"/>	14. Bahan penunjang mata pelajaran	<input type="text"/>	<input type="text"/>	15. Seragam sekolah dan olahraga	<input type="text"/>	<input type="text"/>	16. Buku, alat tulis dan perlengkapan bersekolah (a + b)	<input type="text"/>	<input type="text"/>	a. Buku pelajaran/panduan/ diktat	<input type="text"/>	<input type="text"/>	b. Alat tulis dan perlengkapan lainnya	<input type="text"/>	<input type="text"/>	17. Transportasi (termasuk biaya antar jemput)	<input type="text"/>	<input type="text"/>	18. Kursus sehubungan dengan sekolah/kuliah	<input type="text"/>	<input type="text"/>	19. Lainnya	<input type="text"/>	<input type="text"/>	TOTAL		<input type="text"/>	(11+12+13+14+15+16+17+18+19)		
Jenis Pengeluaran	Bulan terakhir (Rp)	Selama Juli-Desember (000 Rp)																																																										
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16. Buku, alat tulis dan perlengkapan bersekolah (a + b)	<input type="text"/>	<input type="text"/>																																																										
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TOTAL		<input type="text"/>																																																										
(11+12+13+14+15+16+17+18+19)																																																												
Rincian 7 s.d 10, Hanya Untuk SD, SLTP, SMU/K																																																												
7. a. Apakah belajar di luar jam sekolah/tutorial selama empat wulan terakhir? Ya 1 Tidak 2 <input type="text"/> [R.10]		<input type="text"/>																																																										
b. Apakah belajar berkelompok? Ya 1 Tidak 2 <input type="text"/>		<input type="text"/>																																																										
c. Apakah belajar dengan bantuan pembimbing? Ya 1 Tidak 2 <input type="text"/> [R.9.a]		<input type="text"/>																																																										
8. a. Bila R.7.e=1, siapa yang membimbing? Art 1 Famili 3 Teman sekolah 2 Orang lain 4 <input type="text"/>		<input type="text"/>																																																										
b. Apakah membayar pembimbing? Ya 1 Tidak 2 <input type="text"/>		<input type="text"/>																																																										

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APPENDIX E
HEALTH QUESTIONNAIRE FOR THE 1998 *MODULE* SURVEY

This appendix provides only relevant parts of the health questionnaire of the 1998 Susenas *Module* survey: the household characteristics section and that covering household expenditures on health. Although this survey covered health as well as education, the health questionnaire was separated from that of other topics because it contained far more detailed questions than in the past.

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VSEN98.MKG

REPUBLIK INDONESIA
BIRO PUSAT STATISTIK

SURVEI SOSIAL EKONOMI NASIONAL 1998

KETERANGAN KESEHATAN DAN GIZI
ANGGOTA RUMAH TANGGA

I. PENGENALAN TEMPAT			
01	Propinsi		□□
02	Kabupaten/kotamadya*)		□□
03	Kecamatan		□□□□
04	Desa/kelurahan*)		□□□□
05	D a e r a h	<i>Perkotaan 1 Pedesaan 2</i>	□
06	Nomor wilayah pencacahan		
07	Nomor kelompok segmen		
08	Nomor segmen		
09	Nomor kode sampel		□□□□□□
10	Nomor urut rumah tangga sampel		□□
11	Klasifikasi desa	<i>Tertinggal 1 Tidak tertinggal 2</i>	diisi Editor <input type="checkbox"/>

II. KETERANGAN RUMAH TANGGA			
01	Nama kepala rumah tangga:	03	Banyaknya art umur 0 - 59 bulan: □□
		04	Banyaknya art berobat jalan dalam 1 bulan terakhir: □□
02	Banyaknya anggota rumah tangga: □□	05	Banyaknya art rawat inap dalam 12 bulan terakhir: □□

III. KETERANGAN PENCACAHAN			
01	Nama dan NIP/NMS pencacah: □□□□□□	05	Nama dan NIP/NMS pengawas/pemeriksa: □□□□□□
02	Jabatan pencacah: <i>Staf KS Propinsi 1 Mantis 3</i> <input type="checkbox"/> <i>Staf KS Kab/Kod 2 Mitra 4</i>	06	Jabatan pengawas/pemeriksa: <i>Staf KS Propinsi 1 Mantis 3</i> <input type="checkbox"/> <i>Staf KS Kab/Kod 2 Mitra 4</i>
03	Tanggal pencacahan:	07	Tanggal pengawasan/pemeriksaan:
04	Tanda tangan pencacah:	08	Tanda tangan pengawas/pemeriksa:

*) Coret yang tidak perlu

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V. KETERANGAN KESEHATAN ANGGOTA RUMAH TANGGA						
Nama: No. Urut:		4. Apakah berobat jalan dalam 1 bulan terakhir? [Cek pada Kor Blok V R.6.a] Ya 1 Tidak 2 [R.7]				
1. Apakah pernah mengobati sendiri dalam 1 bulan terakhir? [Cek pada Kor Blok V R.5.a] Ya 1 Tidak 2 [R.3]		2. Besarnya biaya yang dikeluarkan: Rp		3. Sumber biaya berobat jalan dalam 1 bulan terakhir: [Isikan kode 1 bila ya, kode 0 bila tidak]		
3. Apakah tersedia jaminan pembiayaan/asuransi kesehatan untuk keperluan berobat jalan/rawat inap seperti dibawah ini? [Isikan kode 1 bila ya, kode 0 bila tidak]		a. Askes <input type="checkbox"/>		d. Asuransi lain <input type="checkbox"/>		f. Jasa rahaerja <input type="checkbox"/>
b. Astek/jamsostek <input type="checkbox"/>		e. Dana sehat <input type="checkbox"/>		g. Dana sehat <input type="checkbox"/>		h. Kartu sehat <input type="checkbox"/>
c. Perusahaan/kantor <input type="checkbox"/>		f. Kartu sehat <input type="checkbox"/>		d. Asuransi lain <input type="checkbox"/>		i. Surat luraah/kades <input type="checkbox"/>
				e. Perusahaan/kantor <input type="checkbox"/>		j. Pihak lain <input type="checkbox"/>
6. Rincian mengenai berobat jalan dalam 1 bulan terakhir: [Cek pada Kor Blok V R.6.b]						
Pelayanan	Biaya total (dalam Rp.)	Yang dibayai rumah tangga (dalam Rp.)	Mendapat suntikan: Ya 1 Tidak 2 k.(6) +-	Suntikan atas permintaan siapa? ART 1 Pengobat 2	Mendapat obat untuk dimakan/diminum Ya 1 Tidak 2	Kepuasan terhadap pelayanan Sangat puas 1 Puas 2 Kurang puas 3 Tidak puas 4
(1)	(2)	(3)	(4)	(5)	(6)	(7)
a. RS Pemerintah			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. RS Swasta			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Praktek dokter			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Puskesmas			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Puskesmas pembantu			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Dinkes			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Praktek petugas kesehatan			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Praktek pengobatan tradisional			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Polindes			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Posyandu			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Frekuensi konsultasi/pemeriksaan kesehatan, kir kesehatan, periksa hamil, periksa bayi sehat dalam 1 bulan terakhir:			9. Pernahkah rawat inap dalam 12 bulan terakhir? Ya 1 Tidak 2 [R.12]			
a. RS Pemerintah <input type="checkbox"/>			10. Sumber biaya rawat inap dalam 12 bulan terakhir: [Hanya untuk art yang sudah selesai rawat inap, Isikan kode 1 bila ya, kode 0 bila tidak]			
b. RS Swasta <input type="checkbox"/>			a. Rumah tangga <input type="checkbox"/>		f. Jasa rahaerja <input type="checkbox"/>	
c. Praktek dokter <input type="checkbox"/>			b. Askes <input type="checkbox"/>		g. Dana sehat <input type="checkbox"/>	
d. Puskesmas <input type="checkbox"/>			c. Astek/jamsostek <input type="checkbox"/>		h. Kartu sehat <input type="checkbox"/>	
e. Puskesmas pembantu <input type="checkbox"/>			d. Asuransi lain <input type="checkbox"/>		i. Surat luraah/kades <input type="checkbox"/>	
f. Poliklinik <input type="checkbox"/>			e. Perusahaan/kantor <input type="checkbox"/>		j. Pihak lain <input type="checkbox"/>	
g. Praktek petugas kesehatan <input type="checkbox"/>						
h. Pengobatan tradisional <input type="checkbox"/>						
i. Polindes <input type="checkbox"/>						
j. Posyandu <input type="checkbox"/>						
k. Besarnya biaya yang dikeluarkan: Rp						

11. Rincian mengenai rawat inap dalam 12 bulan terakhir:

Pelayanan	Lama hari rawat	Biaya total (dalam Rp)	Yang dibayar rumah tangga (dalam Rp.)	Kepuasan terhadap pelayanan Sangat puas 1 Puas 2 Kurang puas 3 Tidak puas 4
(1)	(2)	(3)	(4)	(5)
a. RS Pemerintah	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
b. RS Swasta	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
c. Puskesmas	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
d. Rumah beralin	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
e. Pondok beralin desa	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
f. Rawat inap dukun	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
g. Lainnya	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>

HANYA UNTUK ANAK UMUR 0-59 BULAN

12. Berapa kali anak ditimbang selama 6 bulan terakhir? kali

13. a. Bila R.12*Q, waktu penimbangan yang terakhir
Tanggal: Bulan:

b. Berat badan Balita menurut catatan terakhir: kg

20. Bila mengalami luka bakar (karena terkena api, minyak panas, air panas, benda panas) apa tindakan pertama yang harus segera dilakukan? [Jawaban benar apabila responden menyebutkan harus secepatnya disiram/direndam air dingin beberapa menit]
Jawaban benar 1 Tidak tahu 3
Jawaban salah 2

HANYA UNTUK UMUR 30 TAHUN KE ATAS

14. a. Tanggal penimbangan oleh petugas
Tanggal: Bulan:

b. Berat badan Balita hasil penimbangan kg

21. Apakah dalam lima tahun terakhir melakukan general check-up (pemeriksaan kesehatan umum menyeluruh)?
Ya 1 Tidak 2 [R.23]

22. Apakah dalam general check-up tersebut dilakukan pemeriksaan laboratorium lengkap (kimia darah, urin), foto rontgen dan ECG?
Ya 1 Tidak 2

HANYA UNTUK UMUR 1 TAHUN KE ATAS

15. Kebiasaan sarapan pagi dalam 6 bulan terakhir
Setiap hari 1 Tidak pernah 3
Kadang-kadang 2

16. Apakah biasa menggosok gigi setiap hari? [Isikan kode 1 bila ya, kode 0 bila tidak]

a. Setelah makan c. Setelah bangun pagi

b. Sebelum tidur malam d. Lainnya

17. Apakah pernah mendapatkan pemeriksaan dokter gigi/perawat gigi dalam 6 bulan terakhir?
Ya 1 Tidak 2 [R.19]

18. Apakah tujuan pemeriksaan tersebut?
Berobat gigi 1 Check-up 8
Pasang gigi palsu 2 Lainnya 16
Perawatan gigi 4

HANYA UNTUK WANITA 30 TAHUN KE ATAS (Sebelum menanyakan pertanyaan berikut pecacah harap minta maaf dahulu)

23. Apakah mengetahui atau pernah mendengar SADARI (periksa payudara sendiri)?
Ya 1 Tidak 2 [R.25]

24. Berapa kali melakukan SADARI tersebut dalam satu tahun terakhir?
10-12 kali 1 4-6 kali 3 Tidak
7-9 kali 2 1-3 kali 4 pernah 5

25. Apakah mengetahui pernah mendengar Tes Pap Smear (Tes Pap)?
Ya 1 Tidak 2 [Selesai]

HANYA UNTUK UMUR 15 TAHUN KE ATAS

19. Apakah mengalami kelainan tidur dalam 1 bulan terakhir?
Ya 1 Tidak 2

26. Kapan Tes Pap Smear yang terakhir? (Hanya untuk yang pernah kawin)
0-11 bulan yl. 1 ≥ 36 bulan yl. 4
12-23 bulan yl. 2 Tidak pernah 5
24-35 bulan yl. 3

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APPENDIX F
QUESTIONNAIRE FOR THE 2000 EDUCATION *MODULE* SURVEY

This appendix provides only relevant parts of the questionnaire of the 2000 Susenas education *Module* survey: the household characteristics section and that covering household expenditures on education.

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SUSENAS **VSEN2000.MSBP**

REPUBLIK INDONESIA
BADAN PUSAT STATISTIK

SURVEI SOSIAL EKONOMI NASIONAL 2000
KETERANGAN SOSIAL BUDAYA DAN PENDIDIKAN

Rahasia

I. PENGENALAN TEMPAT			
1	Propinsi	Jawa Barat	3 2
2	Kabupaten/kotamadya*)	Pasuruan	1 2
3	Kecamatan	Lingsar	0 6 5
4	Desa/kelurahan*)	Desa Pajene	2 1
5	Klasifikasi desa/kelurahan	1 Perkotaan 2 Pedesaan	1
6	Nomor wilayah pencacahan	0 0 0	
7	Nomor kelompok segmen		
8	Nomor kode sampel	0 0 0 0 0	
9	Nomor urut sampel rumah tangga	3	0 3

II. KETERANGAN RUMAH TANGGA			
1	Nama kepala rumah tangga: SUFENDI	3	Banyaknya art penyandang cacat: <input type="text"/>
2	Banyaknya anggota rumah tangga: <input type="text" value="03"/>	4	Banyaknya art berumur 5 tahun ke atas yang bersekolah: <input type="text"/>

III. KETERANGAN PENCACAHAN			
1	Nama dan NIP pencacah: <input type="text"/>	5	Nama dan NIP pengawas/pemeriksa: ANANG <input type="text"/>
2	Jabatan pencacah: 1. Staf BPS Propinsi 3. Mantis <input type="checkbox"/> 2. Staf BPS Kab/Kodya 4. Mitra	6	Jabatan pengawas/pemeriksa: 1. Staf BPS Propinsi 3. Mantis <input type="checkbox"/> 2. Staf BPS Kab/Kodya 4. Mitra
3	Tanggal pencacahan: <input type="text"/>	7	Tanggal pengawasan/pemeriksaan: <input type="text"/>
4	Tanda tangan pencacah: <input type="text"/>	8	Tanda tangan pengawas/pemeriksa: <input type="text"/>

*) Coret yang tidak perlu

May 30, 2003

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VII. KETERANGAN PENDIDIKAN UNTUK YANG MASIH BERSEKOLAH (ART 5 TAHUN KE ATAS)																																		
<p>25.a. Terdaftar dan aktif di sekolah:</p> <p>01. SD 08. M. Aliyah 02. M. Ibtidaiyah 09. SMK 03. Paket A setara 10. Diploma I/II 04. SLTP 11. D III/Sarjana Muda 05. M. Tsanawiyah 12. D IV/S1 06. Paket B setara 13. S2 07. SMU 14. S3</p> <p>[Bila R.25.a = 01 s.d. 06 ➡ R.26.a]</p>	<p><input type="checkbox"/> <input type="checkbox"/></p>	<p>35. Biaya Pendidikan Anggota Rumah Tangga:</p> <table border="1"> <thead> <tr> <th>Jenis Pengeluaran</th> <th>Juli - Desember 1999 (Dalam Rupiah)</th> </tr> <tr> <th>(1)</th> <th>(2)</th> </tr> </thead> <tbody> <tr> <td>a. Pendaftaran (uang pangkal/pedang, daftar ulang)</td> <td>.....</td> </tr> <tr> <td>b. SPP</td> <td>.....</td> </tr> <tr> <td>c. POMO/BP3</td> <td>.....</td> </tr> <tr> <td>d. Praktikum/ketrampilan</td> <td>.....</td> </tr> <tr> <td>e. Iuran lainnya (seperti: OSIS)</td> <td>.....</td> </tr> <tr> <td>f. Evaluasi/ujian</td> <td>.....</td> </tr> <tr> <td>g. Bahan penunjang mata pelajaran</td> <td>.....</td> </tr> <tr> <td>h. Seragam sekolah dan olahraga</td> <td>.....</td> </tr> <tr> <td>i. Buku pelajaran/panduan/diktat</td> <td>.....</td> </tr> <tr> <td>j. Alat tulis dan perlengkapan lainnya</td> <td>.....</td> </tr> <tr> <td>k. Transportasi (termasuk biaya antar-jemput)</td> <td>.....</td> </tr> <tr> <td>l. Kursus sehubungan dengan sekolah/kuliah</td> <td>.....</td> </tr> <tr> <td>m. Lainnya</td> <td>.....</td> </tr> <tr> <td>TOTAL (R.35.a s.d. R.35.m)</td> <td>.....</td> </tr> </tbody> </table>	Jenis Pengeluaran	Juli - Desember 1999 (Dalam Rupiah)	(1)	(2)	a. Pendaftaran (uang pangkal/pedang, daftar ulang)	b. SPP	c. POMO/BP3	d. Praktikum/ketrampilan	e. Iuran lainnya (seperti: OSIS)	f. Evaluasi/ujian	g. Bahan penunjang mata pelajaran	h. Seragam sekolah dan olahraga	i. Buku pelajaran/panduan/diktat	j. Alat tulis dan perlengkapan lainnya	k. Transportasi (termasuk biaya antar-jemput)	l. Kursus sehubungan dengan sekolah/kuliah	m. Lainnya	TOTAL (R.35.a s.d. R.35.m)
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m. Lainnya																																	
TOTAL (R.35.a s.d. R.35.m)																																	
<p>b. Program studi: (.....)</p>	<p>dilisi Editor <input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>26.a. Jarak terdekat yang biasa ditempuh dari tempat tinggal ke sekolah: km</p> <p>b. Lama perjalanan: menit</p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>27. Sarana pergi ke sekolah:</p> <p>1. Kendaraan bermotor yang dikuasai rt 2. Kendaraan tidak bermotor yang dikuasai rt 3. Kendaraan umum bermotor 4. Kendaraan umum tidak bermotor 5. Kendaraan orang lain gratis 6. Jalan kaki</p>	<p><input type="checkbox"/></p>																																	
<p>28. Jenis olahraga yang biasa diikuti di sekolah:</p> <p>1. Ya 2. Tidak</p> <p>a. Senam SKJ <input type="checkbox"/> d. Bola kecil/kasti <input type="checkbox"/> b. Senam lantai <input type="checkbox"/> e. Bola besar/basket <input type="checkbox"/> c. Atletik <input type="checkbox"/> f. Renang <input type="checkbox"/></p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>29. Apakah mempunyai kesulitan pembiayaan sekolah selama Juli-Desember 1999? 1. Ya 2. Tidak</p> <p>a. Uang sekolah <input type="checkbox"/> c. Transportasi <input type="checkbox"/> b. Uang buku/peralatan sekolah <input type="checkbox"/> d. Lainnya <input type="checkbox"/></p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>30. Apakah memperoleh beasiswa/keringanan? 1. Ya 2. Tidak ➡ [R.35]</p>	<p><input type="checkbox"/></p>																																	
<p>31. Sumber beasiswa/keringanan:</p> <p>1. Ya 2. Tidak</p> <p>a. Pemerintah/JPS <input type="checkbox"/> d. Lembaga lain <input type="checkbox"/> b. Pemerintah/Non-JPS <input type="checkbox"/> e. Sekolah <input type="checkbox"/> c. GN-OTA <input type="checkbox"/> f. Perorangan <input type="checkbox"/></p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>32. Bentuk beasiswa/keringanan:</p> <p>1. Ya 2. Tidak</p> <p>a. Uang <input type="checkbox"/> c. Pembayaran uang sekolah <input type="checkbox"/> b. Barang <input type="checkbox"/> d. Keringanan dari sekolah <input type="checkbox"/></p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>33. Besarnya uang beasiswa/keringanan per bulan: Rp. <input type="checkbox"/> <input type="checkbox"/></p>																																		
<p>34. Bila R.32.a berkode 1, penggunaan uang beasiswa:</p> <p>1. Ya 2. Tidak</p> <p>a. Biaya sekolah <input type="checkbox"/> c. Jajan <input type="checkbox"/> b. Orang tua <input type="checkbox"/> d. Lainnya <input type="checkbox"/></p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>																																	
HANYA UNTUK MURID SD/SLTP/SM																																		
<p>35.a. Apakah belajar di luar jam sekolah/tutorial selama catur wulan terakhir? 1. Ya 2. Tidak ➡ [R.39]</p> <p>b. Apakah belajar berkelompok? 1. Ya 2. Tidak</p> <p>c. Apakah belajar dengan bantuan pembimbing? 1. Ya 2. Tidak ➡ [R.38]</p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>37. Siapa yang membimbing?</p> <p>1. Orang tua/wali 3. Teman sekolah 2. Pamili 4. Orang lain</p>	<p><input type="checkbox"/></p>																																	
<p>38. Rata-rata lama belajar di luar jam sekolah per hari selama seminggu yang lalu: jam</p>	<p><input type="checkbox"/></p>																																	
<p>39. Ketersediaan buku wajib pada catur wulan yang berjalan:</p> <p>1. Ada 2. Tidak ada</p> <p>a. PPKn <input type="checkbox"/> e. IPS <input type="checkbox"/> i. Biologi <input type="checkbox"/> b. Bhs Indonesia <input type="checkbox"/> f. Bhs Inggris <input type="checkbox"/> j. Ekonomi <input type="checkbox"/> c. Matematika <input type="checkbox"/> g. Fisika <input type="checkbox"/> k. Sosiologi <input type="checkbox"/> d. IPA <input type="checkbox"/> h. Kimia <input type="checkbox"/> l. Tata negara <input type="checkbox"/></p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>																																	
<p>40. Untuk murid SD/MI, apakah mendapat makanan tambahan (PMTAS) di sekolah selama seminggu yang lalu? Ya, berapa kali (seminggu): 0. Tidak</p>	<p><input type="checkbox"/></p>																																	

May 30, 2003

Benchmarking Susenas Health and Education Data

APPENDIX G
QUESTIONNAIRE FOR THE 2001 HEALTH *MODULE* SURVEY

This appendix provides only relevant parts of the questionnaire of the 2001 Susenas health *Module* survey: the household characteristics section and that covering household expenditures on health.

May 30, 2003

Benchmarking Susenas Health and Education Data



SUSENAS

REPUBLIK INDONESIA
BADAN PUSAT STATISTIK

VSEN2001.KM

SURVEI SOSIAL EKONOMI NASIONAL 2001

**KETERANGAN POKOK RUMAH TANGGA DAN ANGGOTA RUMAH TANGGA
SERTA MODUL KESEHATAN DAN PERUMAHAN**

Rahasia

I. PENGENALAN TEMPAT			
1	Propinsi		□ □
2	Kabupaten/kota*)		□ □
3	Kecamatan		□ □ □ □
4	Desa/kelurahan*)		□ □ □ □
5	Klasifikasi desa/kelurahan	1. Perkotaan 2. Perdesaan	□
6	Nomor blok sensus		
7	Nomor kode sampel		□ □ □ □
8	Nomor urut sampel rumah tangga		□ □

II. KETERANGAN RUMAH TANGGA			
1	Nama kepala rumah tangga:		
2	Banyaknya anggota rumah tangga:		□ □
3	Banyaknya anak usia 0-4 tahun:		□ □

III. KETERANGAN PENCACAHAN			
1	Nama dan NIP pencacah: □ □ □ □ □ □	5	Nama dan NIP pengawas/pemeriksa: □ □ □ □ □ □
2	Jabatan pencacah: 1. Staf BPS Propinsi 3. Mantis <input type="checkbox"/> 2. Staf BPS Kab/Kota 4. Mitra	6	Jabatan pengawas/pemeriksa: 1. Staf BPS Propinsi 3. Mantis <input type="checkbox"/> 2. Staf BPS Kab/Kota 4. Mitra
3	Tanggal pencacahan: Tgl Bln □ □ □ □	7	Tanggal pengawasan/pemeriksaan: Tgl Bln □ □ □ □
4	Tanda tangan pencacah:	8	Tanda tangan pengawas/pemeriksa:

*) Coret yang tidak perlu

26. Apakah tersedia jaminan pembiayaan/asuransi kesehatan untuk keperluan berobat jalan/rawat inap seperti di bawah ini? [Isikan kode 1 bila ya, kode 2 bila tidak]		V.E. KEBIASAAN MEROKOK (ART UMUR 10 TH KE ATAS)	
a. Askes <input type="checkbox"/>	e. Dana sehat <input type="checkbox"/>	35. Apakah merokok dalam 1 bulan terakhir? 1. Ya ⇒ [R.37] 2. Tidak <input type="checkbox"/>	
b. Astek/Jamsostek <input type="checkbox"/>	f. Kartu sehat <input type="checkbox"/>	36. Apakah pernah merokok sebelumnya? 1. Ya ⇒ [R.39]	
c. Perusahaan/Kantor <input type="checkbox"/>	g. JPKM <input type="checkbox"/>	2. Tidak ⇒ [Blok V.F atau art lain]	
d. Asuransi lain <input type="checkbox"/>		37. Jika R.35=1 berapa batang rokok yang dihisap dalam 24 jam terakhir? batang <input type="text"/>	
27.a Frekuensi konsultasi/pemeriksaan ke kesehatan, periksa hamil, periksa bayi sehat dalam 1 bulan terakhir?		38. Apakah biasa merokok di dalam rumah ketika sedang bersama art lain? 1. Ya 2. Tidak <input type="checkbox"/>	
1. RS Pemerintah <input type="checkbox"/>	5. Poliklinik/Lab <input type="checkbox"/>	39. Pada usia berapa mulai merokok? th <input type="text"/>	
2. RS Swasta <input type="checkbox"/>	6. Praktek petkes <input type="checkbox"/>	V.F. FERTILITAS & KELUARGA BERENCANA	
3. Praktek dokter <input type="checkbox"/>	7. Praktek trastra <input type="checkbox"/>	WANITA PERNAH KAWIN UMUR >10 TH (Blok IV, Kolom 4-2, Kolom 6-2, 3, 4)	
4. Puskesmas/Posda <input type="checkbox"/>	8. Polindes/Posyandu <input type="checkbox"/>	40. Umur pada saat perkawinan pertama: tahun <input type="text"/>	
b. Jika salah satu R.27.a.1 s.d. 8 isiananya = 0, berapa besarnya biaya konsultasi yang dikeluarkan ri? Rp <input type="text"/>		41. Jumlah tahun dalam ikutan perkawinan: tahun <input type="text"/>	
V.D. KESEHATAN BALITA (ANAK UMUR 0-59 BULAN)		42. Jumlah anak kandung (a.k.) yang dilahirkan:	
28. Umur: bulan <input type="text"/>		Lk <input type="checkbox"/>	Pr <input type="checkbox"/>
29. Siapa yang menolong proses kelahiran?		La+Pr <input type="checkbox"/>	
1. Dokter <input type="checkbox"/>	4. Dukun <input type="checkbox"/>	a. A.k. lahir hidup <input type="checkbox"/>	
2. Bidan <input type="checkbox"/>	5. Fasulu/Keluarga <input type="checkbox"/>	b. A.k. masih hidup <input type="checkbox"/>	
3. Tenaga paramedis lain <input type="checkbox"/>	6. Lainnya <input type="checkbox"/>	c. A.k. sudah meninggal <input type="checkbox"/>	
30. Apakah pernah dibawa ke Posyandu dalam 1 tahun terakhir?		43. Pernah menggunakan/memakai alat/cara KB? 1. Ya 2. Tidak ⇒ (Art lain) <input type="checkbox"/>	
1. Ya, kurang dari 1 bulan yang lalu <input type="checkbox"/>		WANITA BERSTATUS KAWIN UMUR ≥10 TH	
2. Ya, antara 1-2 bulan yang lalu <input type="checkbox"/>		44. Apakah sedang menggunakan/memakai alat/cara KB? 1. Ya 2. Tidak ⇒ (Art lain atau Blok VI) <input type="checkbox"/>	
3. Ya, lebih dari 2 bulan yang lalu <input type="checkbox"/>		45. Alat/cara yang sedang digunakan/dipakai:	
4. Tidak ⇒ [R.32] <input type="checkbox"/>		1. MOW/tubektomi <input type="checkbox"/>	6. Pil KB <input type="checkbox"/>
31. Pelayanan pada kunjungan terakhir:		2. MGP/vasektomi <input type="checkbox"/>	7. Kondom/karet KB <input type="checkbox"/>
1. Penimbangan <input type="checkbox"/>	8. Pengobatan <input type="checkbox"/>	3. AKDR/TUD/spiral <input type="checkbox"/>	8. Intravag/tissue/kondom wanita <input type="checkbox"/>
2. Imunisasi <input type="checkbox"/>	16. Konsultasi <input type="checkbox"/>	4. Suntikan KB <input type="checkbox"/>	
4. PMI/vitamin/oralit <input type="checkbox"/>	00. Tdk memperoleh pelayanan <input type="checkbox"/>	5. Susuk KB/noeplan/implanon/alwelit <input type="checkbox"/>	9. Alat/cara KB tradisional ⇒ (Art lain/ Blok VI) <input type="checkbox"/>
32.a. Apakah pernah diberi Air Susu Ibu (ASI)?		46. Tempat memperoleh alat/cara KB yg terakhir:	
1. Ya <input type="checkbox"/>	2. Tidak ⇒ [Jika R.28 > 11 bulan ke art lain] <input type="checkbox"/>	01. RS Pemerintah <input type="checkbox"/>	07. Polindes/BIDCV Posyandu <input type="checkbox"/>
b. Jika R.32.a=1, lamanya: bulan <input type="text"/>		02. RS Swasta <input type="checkbox"/>	08. PLKB <input type="checkbox"/>
UNTUK ANAK UMUR 0-11 BULAN		03. Praktek dokter <input type="checkbox"/>	09. PPKBD/Pos KB <input type="checkbox"/>
33. Apakah diberi ASI dalam 24 jam terakhir? 1. Ya 2. Tidak <input type="checkbox"/>		04. Puskesmas/Posda <input type="checkbox"/>	10. Apotik/toko obat <input type="checkbox"/>
34. Apakah kemarin/tadi malam anak diberi makanan atau minuman sbt: [Isikan kode 1 bila ya, kode 2 bila tidak]		05. Poliklinik <input type="checkbox"/>	11. Lainnya <input type="checkbox"/>
a. Susu bubuk bayi <input type="checkbox"/>	f. Bubur susu <input type="checkbox"/>	47. Biaya yang dikeluarkan untuk memperoleh pelayanan KB yang terakhir: Rp <input type="text"/>	
b. Air/telur/lain <input type="checkbox"/>	g. Nasi tim/bubur beras+sayur <input type="checkbox"/>		
c. Buah <input type="checkbox"/>	h. Nasi tim/bubur beras+lauk hewani/nabati+sayur <input type="checkbox"/>		
d. Biskuit bayi <input type="checkbox"/>	i. Lainnya <input type="checkbox"/>		
e. Bubur tepung beras <input type="checkbox"/>			

VII. PENGELUARAN RUMAH TANGGA (LANJUTAN)						
VII.B. PENGELUARAN BUKAN MAKANAN (BERASAL DARI PEMBELIAN, PRODUKSI SENDIRI DAN PEMBERIAN)	Sebulan yang lalu (Rp)	12 bulan yang lalu (Rp)				
(1)	(2)	(3)				
17. Perumahan dan fasilitas rumah tangga (sewa, perkiraan sewa rumah sendiri, rekening listrik, rekening telepon, gas, minyak tanah, air, kayu, dll.)						
18. Aneka barang dan jasa (sabun mandi, kecantikan, pengangkutan, bacaan, pembuatan KTP/SIM, rekreasi, kartu telepon, benda pos, dan lainnya)						
19. Biaya pendidikan (uang pendaftaran, SPP, POMG/BP3, uang pengal-baftar ulang, pramuka, prakarya, kursus, dan lainnya)						
20. Biaya kesehatan (rumah sakit, puskesmas, dokter praktek, dukun, obat-obatan, dan lainnya)						
21. Pakaian, alas kaki, dan tutup kepala (bahan pakaian, pakaian jadi, sepatu, topi, sabun cuci, dan lainnya)						
22. Barang tahan lama (alat rumah tangga, perkakas, alat dapur, alat hiburan, alat olahraga, perhiasan mahal/imitasi, kendaraan, payung, arloji, kamera, pasang telepon, pasang listrik, dll.)						
23. Pajak dan asuransi (PBB, iuran TV, pajak kendaraan, asuransi kecelakaan/kesehatan)						
24. Keperluan pesta dan upacara (perkawinan, khitanan, ulang tahun, perayaan hari agama, upacara adat, dan lainnya)						
25. Jumlah bukan makanan (Rincian 17 s.d. Rincian 24)						
26. Rata-rata pengeluaran makanan sebulan (Rincian 16 x $\frac{30}{7}$)						
27. Rata-rata pengeluaran bukan makanan sebulan (Rincian 25 Kolom 3) 12						
28. Rata-rata pengeluaran rumah tangga sebulan (Rincian 26 + Rincian 27)						
29. Sumber penghasilan utama rumah tangga: (Tulis selengkap-lengkapnya) Isikan kode lapangan usaha/penerima pendapatan dan status pekerjaan sesuai sumber penghasilan utama rumah tangga dalam kotak. Tiga digit pertama untuk kode lapangan usaha/penerima pendapatan dan satu digit terakhir untuk kode status pekerjaan. Kode status pekerjaan: 1. Buruh/karyawan 2. Pengusaha		<p>diisi Editor</p> <table border="1"> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>				