

PN. ABQ-142
84973

AGRICULTURAL POLICY ANALYSIS PROJECT, PHASE II

Under contract to the Agency for International Development, Bureau for Research and Development, Office of Agriculture
Project Office Hampden Square, 4800 Montgomery Lane, Suite 600, Bethesda, MD 20814 • Telephone: (301) 913-0500
Telex: 312636 • Fax: (301) 652-3839

JORDAN GDP METHODOLOGY: GUIDELINES FOR CALCULATING THE CONTRIBUTION OF AGRIBUSINESS TO NATIONAL INCOME IN THE H.K. OF JORDAN

August 1993

**APAP II
Project Document
Report No. 222**

Prepared for

Agricultural Policy Analysis Project, Phase II (APAP II)

and

USAID/Amman

Contract No. LAG 4084-C-00-3601, Project No. 278-0264-3-70364

**Authors: Rosemary Hyson, Abt Associates Inc.
Ismaël Ouédraogo, Abt Associates Inc.**

Prime Contractor: **Abt Associates Inc.**, 55 Wheeler Street, Cambridge, MA 02138 • (617) 492-7100

Subcontractors: **Harvard Institute for International Development**, Harvard University, One Eliot Street, Cambridge, MA 02138 • (617) 495-9779
Food Research Institute, Stanford University, Stanford, CA 94305-6084 • (415) 723-0693
North Carolina State University, Department of Economics and Business, Box 7645, Raleigh, NC 27695-7645 • (919) 515-3107
Abel, Daft & Earley, 1410 King Street, Alexandria, VA 22314 • (703) 739-9090
International Science and Technology Institute, 1129 20th Street, NW, Suite 800, Washington, D.C. 20036 • (202) 785-0831
International Food Policy Research Institute, 1200 17th Street, NW, Washington, D.C. 20036 • (202) 862-5600

TABLE OF CONTENTS

LIST OF ACRONYMS	ii
INTRODUCTION	iii
1. Disaggregation of GDP	1
2. Estimation of the Share of Agribusiness, α_i	2
2.1 Principal Components: Agriculture, Mining, and Manufacturing	3
2.2 Energy and Water, Construction, and the Services Sectors	8
2.2.1 Sector 06: Wholesale and Retail Trade and Hotels and Restaurants	9
2.2.2 Utilities, Infrastructure, and Business Services	9
2.2.3 Producers of Government Services and other Service Sector Activities	11
3. Calculation of Total Value Added in Agribusiness	13
4. Employment and Value Added	13
5. Conclusions	13
TABLE ANNEX	

LIST OF ACRONYMS

GDP Gross Domestic Product

ISIC United Nation's International Standard Classification for All Economic Activity

INTRODUCTION

The method for estimating the contribution of agribusiness to Gross Domestic Product (GDP) and employment follows a simple underlying structure. For each economic activity, gather information on value added and the percentage (α_i) of those activities which can be classified as agribusiness. For each activity, multiply these two variables, value added and α_i , to generate value added from agribusiness for that activity. Then, sum up all the value added from agribusiness for all activities in the entire economy to calculate total value added from agribusiness, which can also be expressed as a percentage of GDP. Similarly, for employment, multiply the two variables, employment generated in each activity and α_i , to generate employment from agribusiness for that activity, and then sum up all employment from agribusiness for the entire economy to calculate total employment from agribusiness.

The process for measuring the contribution of agribusiness to national income can then be divided into three basic steps:

- disaggregation of the traditional sectors of GDP into economic activities, according to the United Nations's International Standard Classification for All Economic Activities (ISIC);
- estimation of the share of agribusiness for each disaggregated economic activity; and
- calculation of total value added of the agribusiness sector.

The process of calculating the contribution of agribusiness to national income can be seen in the worksheet of the Lotus 1-2-3 file AGBIZ.WK1, which comprises three tables. The first table breaks down value added of GDP according to sectors and economic activities. An adjacent table of identical proportions gives the share of agribusiness for each activity in each year. The third table contains the products of the two. The worksheet LABOR.WK1 shows the same process for the contribution of agribusiness to employment, but with activities at only the one-digit level of ISIC.

The approach, analysis, results, and implications are discussed in the Agricultural Policy Analysis Project, Phase II Technical Report No. 131, *The Contribution of Agribusiness to National Income and Employment in Jordan*. The report will provide one with a broader understanding of the purpose of such analysis and anyone endeavoring to use the following methodology outlined here is urged to first read the technical report.

The following sections elaborate on the three steps described above for the contribution of agribusiness to national income (the contribution of agribusiness to employment follows the same pattern). Table 2 gives a flow chart of the worksheets to be constructed and combined in order to achieve the final data set and calculate value added in agribusiness.

1. Disaggregation of GDP

The United Nations's International Standard Classification for All Economic Activities (ISIC)¹ is the framework used to disaggregate GDP. Many countries around the world use the ISIC system to calculate value added of GDP, which facilitates cross-country comparisons. The system has been revised three times since its creation in the 1960s. Each revision has adjusted the framework's organization to give a more representative picture of national economies. The most recent update, Revision 3, was completed in 1990 and countries are gradually switching over to this format. In Jordan, output and value added data of economic activities are collected and reported according to Revision 2. Therefore, the method outlined here uses Revision 2. It is expected that beginning in 1993, Jordan's data will be reported according to Revision 3.

The ISIC code breaks down broad sectors into economic activities at different levels of disaggregation: sectors, classes, groups, and activities. Each successive level of detail adds one digit to the code of the previous higher level. For example, the manufacturing subsector (3.0) includes the class of textiles (32), which in turn includes the group of manufacture of textiles (321), which in turn includes activities such as spinning and weaving (3211). Few countries have information available beyond the ISIC three- or four-digit level.

The method used here relies on a disaggregation at the four-digit level. However, in some cases for manufacturing, and more often in the services sectors, these categories still group too many products or activities and attempts have to be made to further disaggregate them. Some definitions, even spelled out in detail by the publication that describes the UN's classification remain too ambiguous. Furthermore, although many countries use the system, most have a few, if not many, deviations from the classification that are not always apparent in the data. It was extremely valuable for this research to have the cooperation of the National Accounts section at the Department of Statistics. Asking detailed questions is mandatory to discern the correct interpretations of each activity's contents.

The first step is to collect value added data and organize them according to the ISIC code using the worksheet template of the AGBIZ.WK1 Lotus 1-2-3 file. Basic information is available in annual publications from the Department of Statistics, including the *Statistical Yearbook*, *Industrial Survey*, and *Services Survey*, providing value added information for all sectors, with good detail on mining, manufacturing, agriculture, and certain services. These publications, however, do not provide much information on transportation, trade, and other services. Also data for 1991 are still estimates. The *Annual Agricultural Statistics* and the *Construction Statistics* were used to help fill some of these gaps. When the new transportation survey becomes available, it should help complete the data set.

¹ United Nations, Department of International Economic and Social Affairs, Statistical Office. 1990. *International Standard Classification of all Economic Activities*. Third revision. Statistical Papers, Series M, No. 4, Rev. 3. New York: United Nations.

The data from the surveys and statistical annuals are comprehensive enough to complete the value added data table.² The National Accounts section at the Department of Statistics was quite helpful in providing value added information. The staff agreed to load the spreadsheets onto their computer and use their database to fill in the different categories. Their data both updated some errors and estimates from published data and filled in several gaps where published material did not provide information.³

After collecting the data, the next step is to discern what lies behind the numbers, how they are constructed, and how they might be further broken down in order to accurately estimate the share of agribusiness for that activity.

Since the most recent data available was from 1991, this study is concerned with the period from 1987-1991. Changes in the type of data collected for 1992 and 1993 are anticipated, which would not only facilitate the calculation of the contribution of agribusiness, but also increase its accuracy. Notes throughout the report describe the anticipated changes—primarily for agriculture and transportation—and explain their relevance to the calculation.

The data are organized according to the ISIC classification in the AGBIZ.WK1 spreadsheet. The calculations take GDP at producers prices and in nominal terms because the most comprehensive disaggregated data set available was of GDP at these prices.

2. Estimation of the Share of Agribusiness, α_i

The share of agribusiness in agriculture is given (100 percent) by definition. In the other sectors, the share of agribusiness has to be calculated with more or less difficulty. The nature of the activities and data availability determine the way these estimates are calculated, either based on the percentage of agricultural products used as input by these activities, or based on the percentage of output used in agriculture and other agribusiness activities. Also, the estimates of the shares of agribusiness were derived stepwise, since they could not be simultaneously. A set of alphas was first estimated for production agriculture (given by definition), mining, and manufacturing. These shares are referenced and entered into the overall α_i spreadsheet, ALPHA.WK1. After the set of α_i for agriculture, mining, and manufacturing is complete, the shares in ALPHA.WK1 can be applied as needed to estimate α_i for each of the remaining industrial and service sector activities.

² The exception are wholesale and retail trade data. Although figures are given in the *Statistical Yearbook* and the *Services Survey*, these figures are for private sector activity only. In the calculation of GDP the United Nations System of National Accounts requires that adjustments be made to these sectors for government procurement activity, as conducted by the Ministry of Supply in Jordan. The figures for wholesale and retail trade should then be requested from the National Accounts Section at the Department of Statistics.

³ The most recent data published were from 1991. Data for 1992 were not available in April 1993; however, their release is expected shortly.

To facilitate calculations for some of the more involved economic activities' shares of agribusiness, alphas for different economic activities were computed separately in sector or sub-sector worksheets, and then combined together in ALPHA.WK1. The data from ALPHA.WK1 was in turn imported in AGBIZ.WK1 to fill the "Shares of Agribusiness by Economic Activity" table. Table 1 gives the sectors and sub-sectors into which the calculations were broken down, along with the corresponding Lotus spreadsheet name.

2.1 Principal Components: Agriculture, Mining, and Manufacturing

In the process of determining α_i , for each activity in the agriculture, mining and manufacturing sectors, it was necessary to make assumptions when defining different industrial activities falling in the agribusiness sector. Chapter 2 of the principal report, *The Contribution of Agribusiness to National Income and Employment in Jordan* provides a thorough discussion of the definition of agribusiness, and the division below lists activities in Jordan that fall within the sector. Conceptually, the definition of agribusiness is the same as that of the food-and-fiber system used by USDA⁴. This definition includes the contribution of activities whose products may be exported (agricultural produce, fertilizer, etc.) Extensive discussions were held with the Ministry of Agriculture (MOA), and several sections at the Department of Statistics (DOS)—including National Accounts, Industry, Agriculture, Transportation, and Construction—to verify the interpretation of different categories of the classification and how value added was calculated for different activities.

These dialogues proved to be very beneficial since value added is not calculated the same way for each economic activity. Also, several ISIC categories in the manufacturing sector include a mix of agribusiness and non-agribusiness items, with no further detail existing beyond this broad activity. MOA and DOS personnel assisted in identifying both the types of activities within these categories, and other agencies, organizations and firms to contact for more information regarding agribusiness activities within these categories.

Depending on the activity, the alphas for agriculture, mining, and manufacturing, an α_i is assigned by one of the following three methods.

- (a) Direct estimation of α_i in categories discrete enough to be declared either 100 percent or zero percent agribusiness.

$$\alpha_i = 100\%$$

- Agriculture and hunting
- Forestry and logging
- Fishing
- Mining of chemical and fertilizer materials

⁴ As the principal report notes for example, mining is included in the definition of agribusiness based on USDA's data.

- Manufacture of food, beverages, and tobacco products
- Manufacture of paper and paper products
- Sawmills
- Manufacture of wooden and cane containers and small cane wear
- Manufacture of wood and cork products
- Manufacture of fertilizer and pesticide products
- Manufacture of rubber and rubber products

$\alpha_i = 0$

- Coal mining
 - Printing, publishing and allied industries
 - Manufacture of basic industrial chemicals except fertilizers
 - Manufacture of synthetic resins, plastics materials and man-made fibers except glass
 - Manufacture of paints, varnishes and lacquers
 - Manufacture of miscellaneous products of petroleum and coal
 - Manufacture of non-metallic mineral products, except for products of petroleum and coal
 - Basic metal industries
 - Manufacture of machinery except electrical
 - Manufacture of transport equipment
 - Manufacture of professional and scientific, measuring and controlling equipment
 - Other manufacturing industries
- (b) Calculating the percentage of agricultural raw material content of a finished or processed product.
- Manufacture of textiles, leather goods
 - Manufacture of furniture and fixtures, except primarily of metal
 - Upholstery
 - Soap, matches, and candles
- (c) Calculating the proportion of a product's output that is used as an input to agribusiness.
- Petroleum
 - Manufacture of drugs and medicines (for farm animals/livestock)
 - Manufacture of plastics products (irrigation system components, mulch, plastic for plastic houses, plastic crates for transporting agricultural products, and linings for pools and canals)
 - Manufacture of agricultural and forestry machinery
 - Repair of machines and equipment

The estimation of alpha for each of these activities is based on the following assumptions. For the first category (a), alpha was assumed to 100 percent in the agriculture sector, and for activities directly serving this sector (input) or using directly output of this sector (in processing) as their main focus. Alpha was assumed to zero when there was no discernable immediate link to agricultural production and other agribusiness activities in manufacturing⁵. In the second category (b), which includes activities that partly use agricultural products as inputs, the proportion of agricultural products used as inputs was taken as proxy of the proportion of value added from agribusiness in these activities. In the third category (c), which includes activities that partly service the agriculture sector and agribusiness activities in manufacture, the proportion of the output used by these agribusiness activities was taken as a proxy of the share of agribusiness.

To begin the first category (a), either 0 or 100% was placed in the cells of the activities for which alpha was unambiguous.⁶ For each category, this information was confirmed by the DOS and MOA. Assumptions can be made from the definition of an ISIC category as to the types of potential agribusiness activities within that category.

In the second category (b), where alpha was derived from the **proportion of agricultural products in total inputs**, it was necessary to contact manufacturers in the particular activity. The information was gathered in a series of interviews of principal manufacturers in and around Amman. The questions asked, information received, and formulas for calculation are presented in Table 3. The actual calculations for spinning and weaving (3211) and soap (3523) are also given in the spreadsheet containing the alphas for manufacturing, called MANUFAC.WK1.

For manufacturing activities which produce inputs to agricultural production and agribusinesses (category c), the Department of Statistics was able to provide information on the proportion of drugs and medications for livestock out of total output of pharmaceuticals. The *Industrial Survey*, published annually by the Department's Industrial section, provided data on the use of petroleum and expenditures on repair of machinery and equipment by producers in mining and manufacturers. By estimating the amount spent by agriculture and other agribusiness activities on these items, and dividing by the total output of these activities, the shares which serve agriculture are determined. For the two other activities in question—plastics and manufacture of non-electrical machinery and equipment—it was necessary to interview manufacturers in order to gain a sense of the amounts produced for agribusiness. The respective alphas were obtained by dividing the output of plastics and machinery used for agribusiness by the total output of each of these activities.⁷

⁵ Note that because of the ripple effects posited in the Input/Output framework, most activities in the economy will eventually generate value added in order to satisfy a change in the demand for food and fiber.

⁶ With these numbers, the spreadsheet "ALPHA.WK1" can begin to be developed. A blank template can be copied from the value added spreadsheet.

⁷ In each case, total output for each activity was taken from the *Industrial Survey*, where the table for "Gross Value Added by Kind of Industrial Activity," also gives total production in JDs.

The plastic products included in the share of agribusiness are mulch,⁸ plastic sheets for plastic houses, plastic pipes and other components for irrigation systems, linings for canals and pools, and plastic crates for food products. The producers provided sufficient information to piece together the amount of plastics produced for use in agriculture and agribusiness. Still, it was difficult to determine whether certain plastics items were produced under category 3513, "Manufacture of synthetic resins, plastics materials, and man-made fibers except glass—including plastics products in basic forms: sheets, rods, tubes, etc.;" or under category 356, "Manufacture of plastics products, n.e.c.," which includes builders' parts.⁹ Plastic sheets used for mulch and plastic houses could be included in either. PEC pipes are also ambiguous in this regard. Therefore, the two categories were combined, and a joint alpha and joint agribusiness value added were estimated.

Although all manufacturers spoke on the area of the industry they knew best, it was possible to make an estimate from their information. One manufacturer provided us with conservative estimates for average prices and quantities of pipes, PEC pipes, mulch, and plastic sheets for plastic houses produced in Jordan. These calculations amounted to 11.3 million JDs per annum; however linings, drippers and irrigation components, and plastic crates were not included.¹⁰ A second manufacturer consulted estimated total agricultural plastics production to range from 15 to 18 million JDs per annum. It also became clear in the interviews that demand had fallen off in 1991. A total was approximated for each year in the period, ranging from 14 million to 17.5 million JDs. The calculations are detailed in the worksheet, MANUFAC.WK1. Since it was ambiguous which category production of such items as plastic sheets and mulch came under, these figures were divided by the combined total output of categories 3513 and 356, to obtain the alpha for plastics. These estimates should be updated when better information becomes available.

Another activity where ambiguity required categories to be combined is machinery and equipment. All machinery used for any purpose are grouped under category 382. Farm equipment, such as harrows, ploughs, sprayers, etc. thus fall under this category. Statistics for machinery are reported in two groups under category 382: one for machinery and equipment for industry, agriculture, offices, and accounting, and the other for machinery not elsewhere classified (n.e.c.). For 1989, however, it was broken into two ambiguous categories—3821, manufacture of engines and turbines and 3829, manufacture of machinery n.e.c. Therefore, it was considered best to estimate the share of agribusiness for machinery and equipment at the three digit level, combining any and all activities under category 382 for each year.

⁸ Plastic sheets used to insulate the ground and keep water and soil around the plants.

⁹ Definitions of these categories are from United Nations, Statistical Office, 1990, 149-150.

¹⁰ These calculations are detailed in Appendix A and in MANUFAC.WK1.

In Jordan, one large manufacturer and several smaller workshops produce agricultural machinery and equipment.¹¹ An interview with the manufacturer provided data to estimate the total value of agricultural machinery produced in Jordan. Using an average market share and total sales from 1985-1992, total output of agricultural equipment for the entire period, $y_{ag\ equipment, 85-92}$, was approximated. Dividing by total output for category 382 for the seven-year period, yields a proportion that serves as a proxy for α_{382} .¹² The equations below describe the process, and the calculations are laid out in the spreadsheet "MANUFAC.WK1."

$$\frac{y_{firm, 85-92}}{marketshare_{85-92}} = y_{ag\ equipment, 85-92}$$

$$\frac{y_{ag\ equipment, 85-92}}{y_{382, 85-92}} = \alpha_{382}$$

(1)

The proportion of total value added from **petroleum (353)** and from **repair of machinery and equipment (951)** purchased by agriculture and principal agribusiness activities¹³ are the proxies for α_{353} and α_{951} . Data for the amount of each of these purchased by the agriculture, mining, and manufacturing activities are arranged in a table according to the ISIC classification.¹⁴ The amount purchased by an activity j is multiplied by the proportion of j 's value added derived from agribusiness. These products were added up over the three sectors, and then divided by total output for petroleum and repair of machinery and equipment, according to the equation below:

¹¹ To the extent that the researchers could determine, no domestic production of machinery for equipment for agro-processing or agroindustry existed in Jordan. If such activities exist and contribute to value added in this category, they certainly should be included. In cases where such equipment is produced by a large manufacturer's own workshop, the value added from the machinery's production will be reflected in the enterprise's main outputs, and not be counted in value added for machinery and equipment.

¹² Since output for category 382 was not available for 1992, output for 1991 was used as a proxy.

¹³ Here, *principal* refers to the mining and manufacturing sectors.

¹⁴ The worksheet is called FUEL&REP.WK1.

$$\alpha_i = \frac{\sum x_j \alpha_j}{y_i}$$

(2)

where, x_j = expenditure by activity j on petroleum or repairs for machinery and equipment
 α_j = share of agribusiness in activity j
 y_i = total output of activity i
 α_i = share of agribusiness in activity i
 i = petroleum, repairs of machinery and equipment
 j = all economic activities in the agriculture, mining, and manufacturing sectors.

Total output of petroleum and repairs of machinery and equipment (y_i) are taken from the "Total production" column in the gross value added table in each year's *Industrial Survey*.¹⁵ The shares of agribusiness for all the activities in mining and manufacturing established to date provide the values for α_j . Expenditures for each jth activity (x_j) were collected from two sources. For the activities j in the agriculture sector, no published data were available and the information was obtained via interviews with persons in the Department of Statistics' Agriculture Section and persons at the Ministry of Agriculture. The *Industrial Surveys*, however, provided data for all mining and manufacturing activities in two different tables, the first gave fuel use by activity and the second was "Production expenditure on utilities and services."¹⁶ The only gap was expenditure by the agriculture sector on repair of machinery and equipment. Discussions with the Ministry of Agriculture failed to shed further light on the subject. Given that the likelihood of agriculture equipment maintenance being counted in value added for category 951 is small, it is not anticipated that the lack of such data for the agriculture sector will affect the estimation of the contribution of agribusiness to national income.

2.2 Energy and Water, Construction, and the Services Sectors

With these pieces of information, the set of alphas for agriculture, mining and manufacturing is complete. These shares of agribusiness will be used both in the final estimation of agribusiness value added and also to estimate alphas for activities in the remaining sectors of the economy. The next phase calculates alphas for activities in construction, energy and water, and the services sectors of the economy. Many of these activities use an approach similar to that used to estimate α_i for petroleum and repair of machinery. For a few activities, such as restaurants, alphas could be directly assigned. Hotel food services required an informal survey

¹⁵ The table's number is not given since it varies in each edition of the survey.

¹⁶ In the 1991 edition, these were "Table 5: Intermediate consumption of Water, Electricity, and Fuel by industrial activity" and "Table 6: Production expenditures on utilities and services by kind of industrial activity."

of hotels to estimate the share of agribusiness in the hotel food service trade. For wholesale and retail trade, value added was disaggregated by type of good traded to the extent where the share of agribusiness in trade for each specific set of products could be determined.

2.2.1 Sector 06: Wholesale and Retail Trade and Hotels and Restaurants

As stated above, an alpha of 100% could be directly entered into ALPHA.WK1 for **restaurants**. **Hotels** contribute to agribusiness value added through their food and beverage services. No data were available from either the *Services Survey* or the Ministry of Tourism regarding the share of hotel revenues derived from food and beverage services. Five food and beverage managers from four- and five-star hotels in the Amman area were contacted. The results indicate that 35-40% of the hotels' revenue is derived from food and beverage services. This percentage cannot be applied across the board, since both the quality and location of the hotels affect the percentage of revenues to be derived from food services. One would expect the percentage to be lower in three-star hotels, and almost zero in one- and two-star hotels. On the other hand, the four- and five-star hotels provide a greater percentage of the industry's value added. Therefore, checking back with a few hotel managers, the figure of 25% was taken to represent the total percentage of all hotel revenues derived from food and beverage services, and hence represents the share of agribusiness in such activities. More accurate estimates can be obtained by working with the Ministry of Tourism, which was contacted but could not provide the required information during the mission.

For the **wholesale and retail** trade activities, the National Accounts section provided us with value added from trade by type of good for 1990 and 1991. The categories of traded goods correspond approximately with agribusiness shares developed for the production of agricultural and industrial goods. These agribusiness shares for production are applied to the corresponding category of wholesale or retail trade. The share of agribusiness for each trade category is multiplied by value added for trade. Summing up the agribusiness trade across the different categories and then dividing by total value added for wholesale and retail trade yields respective alphas for these activities. Lacking data for 1987-1989, the weighted average of the 1990 and 1991 alphas for wholesale and retail trade were used for these years. These numbers must be treated with caution, however, since the period coincides with the Gulf crisis, when the embargo, blockades, and finally the war itself placed significant constraints on the volume and income derived from trade during this period. The calculations are found in 06ALPHA.WK1.

2.2.2 Utilities, Infrastructure, and Business Services

Data on the use of utilities, infrastructure, and services by agriculture, mining, and industry were sufficient to approximate the share of the utility, infrastructure, or service being used by mining and manufacturing agribusinesses. Using an approach identical to that for estimating the alphas for petroleum and machinery and equipment repair, the set of alphas for agriculture, mining, and manufacturing, and total output data, the share of agribusiness, α_i was estimated for each of the following:

- water
- electricity
- construction
- transportation
- communication
- insurance
- legal services
- accounting
- advertising

With the exception of water, the alphas for these activities will be slightly underestimated, since only the *Industrial Survey* and not the *Annual Agricultural Statistics* lists expenditure on the above list of activities.¹⁷ It is understood, however, that future agriculture data sets will contain some of this information. Total output for the activities were given in either the *Industrial Survey*, or the *Services Survey*. Such output data for transportation and communication, however, was not published and had to be obtained from the National Accounts Section at the Department of Statistics. Table 4 is a useful guide to the calculation of alphas for each of the above activities, including the sources for data required by Equation 1, and the worksheets that contain the actual data and α_i calculations.

The data for construction were also limited. Capital formation data served as the proxy for construction by agribusiness enterprises. Each *Industrial Survey* contains information on capital formation, but in the publication, it is not listed by type of asset, i.e. non-residential buildings, machinery, etc. Only the 1988 *Industrial Census* listed capital formation by type of asset. For the other years, the Department of Statistics has unpublished data on capital formation in industry by type of asset, but the data was not accessible in time to be included in the present set of calculations. Therefore, the 1988 share of construction for agribusiness activities was applied to the entire 1987-91 period. Also, the share does not include construction in agriculture, for although the *Agricultural Capital Formation Survey* for 1988 gives new construction of different types of buildings, the different types of buildings (residential, storage, animal shelters, etc.) are not clearly separated. In addition, the agriculture data does not separate out what farmers pay to have constructed from what they construct themselves.¹⁸

It was not possible to use similar data for **real estate and machinery and equipment rentals**. The data reported for expenditure was in terms of rent, whereas commissions and other factors determine the output of the sector. There was also no information for real estate sales. Instead, a one-to-one correspondence was assumed between the share of agribusiness activities in agriculture, mining, and manufacturing sectors in GDP and the share of service output which real estate, equipment leasing, and business organizations provide to agriculture. Therefore, a combined alpha—share of agribusiness—was calculated for agriculture, mining, and

¹⁷ Data on water used by crop and livestock production in the agriculture sector was obtained from the Agriculture Section at the Department of Statistics. The information, however, does not differentiate between water delivered by irrigation authorities and that provided by the farmer's own sources. It is understood that the improved Agriculture Survey, conducted in 1992, will differentiate between energy, water, construction, and other services provided by the agricultural producer and that which is purchased from another.

¹⁸ According to discussions with the Agriculture Section, questions have been added to the agriculture survey which will help to differentiate between farmers' own production and that purchased from another.

manufacturing by taking a weighted average of the alphas for each activity in the three sectors. This "aggregated" alpha is the proxy for the share of real estate and equipment leasing provided to the agribusiness sector. The aggregated share is calculated in the spreadsheet AGTEMP.WK1, and entered directly into ALPHA.WK1 for both of these activities.

In AGTEMP.WK1, weighted alphas are calculated at increasing levels of aggregation. They are compiled by multiplying α_i by value added for the components of the category being aggregated, and then dividing by total value added for the aggregate.

In the category of **banking and financial services**, the closest disaggregated information available was Central Bank of Jordan data for outstanding licensed bank credit (OLBC) by sector.¹⁹ Therefore, weighted, aggregated alphas were again calculated for each OLBC category and multiplied by the credit for that sector to approximate the amount of lending to the sector's agribusiness activities. Then, the agribusiness credit for each category are added together and divided by total OLBC to obtain the alpha for banking services.²⁰

2.2.3 Producers of Government Services and other Service Sector Activities

Alternative approaches also had to be used to derive the share of value added from producers of government services and business organizations. In general, value added can be calculated in one of two ways: as the difference between total output and intermediate consumption or as the sum of factor payments. Producers of government services provide valuable services, but these are not purchased and therefore, it is difficult to value a particular service output. Instead, for this sector's activities value added for agribusiness is the sum of factor payments—or total compensation paid—to producers of services involved in agribusiness. The government institutions identified as "agribusiness" are: the Ministry of Agriculture, the Faculties of Agriculture at the University of Jordan and the University of Science and Technology, agriculture vocational training institutions supported by the Ministry of Education, industrial cities, and the agribusiness activities of the Jordan Cooperative Organization.²¹

Data for total compensation, or value added, of the different "agribusiness" government institutions (Ministry of Agriculture, Ministry of Education's Agriculture Vocational Training) were obtained from the Department of Statistics. Information on the University of Jordan's Faculty of Agriculture were acquired from the University of Jordan (UJ). Compensation was given net of transportation and social insurance payments which had to be calculated and added

¹⁹ In some cases, OLBC was given by sub-sector. For example, Wholesale and Retail Trade were separated from Hotels and Restaurants and only Transportation, exclusive of communication and storage, were listed.

²⁰ The calculations for the aggregate alphas are given in AGTEMP.WK1 which are referenced by the spreadsheet, 81ALPHA.WK1, where the remaining calculations to derive the agribusiness share of banking/financing are found.

²¹ Certainly, there are groups in the Ministry of Supply, Ministry of Trade and Industry, Department of Irrigation and other areas of the government that provide services to the agribusiness sector. Constraints prevented their inclusion in this calculation, but by no means should this preclude their inclusion in the next round of calculations of the indicator.

to the total wage bill. Although total compensation data were available for the University of Science and Technology (S&T), no specific information was available for its agriculture programs. Also, S&T has only been fully operational since 1989. Therefore, it was assumed that the relative size of the Faculty of Agriculture at S&T (relative to the whole university) was the same as the Faculty of Agriculture at the UJ. Therefore, the total compensation for the Faculty of Agriculture at S&T equals the total compensation bill for S&T, multiplied by the proportion of compensation for the Faculty of Agriculture at the UJ and to total compensation for all the entire UJ.

The Jordan Cooperative Organization provides extensive services to farmers, providing loans for inputs, offering information on marketing, processing, etc. No information on salaries were available.²² Therefore, its agribusiness value added was estimated from information obtained in an interview with the Deputy General Director, in which he estimated that JCO provides 6 million JDs worth of services to agriculture alone. To relate it to value added, the 6 million was divided by the total government expenditure. This percentage of JCO activity to total government spending served as the proxy for the share of agribusiness in value added by producers of government services.

The last activity for producers of government services is the "industrial cities." They are industrial parks where services such as utilities, transportation, etc. are provided for industrial enterprises. The Department of Statistics was able to provide us with the value added from industrial cities, but no information was available on the types of industries in the cities. Lacking this information, we took the proportion of agribusiness in industry to approximate the share contributed to agribusiness production by industrial cities. This share is multiplied by value added for industrial activities to obtain the agribusiness income from the services and infrastructure provided in industrial surveys.

The sum of value added for these activities represents total agribusiness value added in the category of producers of government services. This sum, divided by total value added in producers of government services is α_1 for producers of government services.

Only a few of the remaining activities in the Community and Household Services sector serve agribusiness, since education and veterinary care are mostly in the producers of government services category, and the other activities have no connection to agribusiness.²³ One activity, the ISIC category of "Business, professional, and labor associations," which includes labor unions, chambers of commerce, and trade and professional associations, is

²² Given the extensive number of information, extension, finance, and marketing services provided by JCO to agricultural producers, further attempts to arrive at a more precise value for the services JCO provides to agribusiness are recommended.

²³ The ISIC classification terms the sector, "Community, Social, and Personal Services." In Jordan, however, these activities are distributed among the following sectors, "Producers of Government Services," "Community, Social, and Personal Services," "Private non-profit services to households," and "Domestic services of households." The calculations only separate out producers of government services' value added. The other categories are all included together.

potentially connected to the agribusiness sector. The National Accounts Section at the Department of Statistics was able to provide us with value added from such activities for 1987-1991. Lacking other information, only an approximation of the percentage of these organizations related to agribusiness could be used. It was assumed that business organization related to agribusiness would be primarily in the mining and manufacturing sectors. Therefore, this approximation was the share of value added from agribusiness in mining and manufacturing to total GDP. This number was calculated in AGTEMP.WK1, and placed directly in ALPHA.WK1 for activity 935, Business, professional, and labor associations.

3. Calculation of Total Value Added in Agribusiness

If the data for value added and alpha were properly input, there is very little left to calculating total value added in agribusiness. In the AGBIZ.WK1 worksheet, the shares of agribusiness are referenced from the ALPHA.WK1 spreadsheet, and the products of value added and the share of agribusiness are given in a table of identical proportions further down in the spreadsheet. The final sum should always be checked, to ensure that activities are not double-counted or missed in the formulas.²⁴ When proper checks are done, after all the data for value added and alpha have been provided, the spreadsheets should complete the calculation of total agribusiness value added, followed by the percentage of agribusiness to total value added.

4. Employment and Value Added

Information on employment is not as rich as that on value added in Jordan. Until better data on employment in agriculture are available, a complete calculation of the contribution of agribusiness to employment cannot be made. Sectoral data for the non-agricultural sector and aggregated alphas for different sectors, however, were used. When more information becomes available, future analysis could use the alpha generated in ALPHA.WK1 and the more disaggregated employment data to calculate the total contribution of agribusiness to employment in Jordan.

5. Conclusions

These guidelines and the computer files that go with them will help the Ministry of Agriculture assess and monitor the contribution of agribusiness in Jordan in the future. The approach that these guidelines implement represents a reasonable, practical estimation of the contribution of agribusiness to national income and to non-agricultural employment, given the available information. In any country, the quality of such a calculation depends on the process and type of national income data collected. Close cooperation between the Ministry of Agriculture and the Department of Statistics, should help to improve the accuracy of the information required for this calculation. An appropriate use of resources, for example surveys targeting key manufacturers, might be geared toward a better understanding of the manufacturing

²⁴ Since the total value added for agribusiness is based on the sum of the sub-totals for each sector, which in turn are subtotals of sub-sectors, etc., it is always a good idea to verify the sub-totals at subsequent levels of aggregation.

and service components of the agribusiness sector and their interaction with agricultural production in Jordan.

TABLE ANNEX

TABLE 1: ISIC SECTORS AND CORRESPONDING VALUE ADDED WORKSHEETS

ISIC SECTOR		α_i WORKSHEET
01	Agriculture, Hunting, Forestry, and Fishing	AGMIN.WK1
02	Mining and Quarrying	AGMIN.WK1
03	Manufacturing	MANUFAC.WK1
	353 Petroleum Refineries	FUEL&REP.WK1
	951 Repairs of Machinery and Equipment	FUEL&REP.WK1
04	Electricity, Gas, and Water Supply	ENERGY.WK1
05	Construction	CONSTR.WK1
06	Wholesale and Retail Trade; Restaurants and Hotels	
	61/62 Wholesale and Retail Trade	ALPHA.WK1
	63 Restaurants and Hotels	06ALPHA.WK1
07	Transportation and Communication	TRANS&COM.WK1
08	Financing, Insurance, Real Estate, and Business Services	
	81 Financial Institutions	81ALPHA.WK1
	other Insurance, Real Estate, and Business Services	BUSSVCS.WK1
09	Community, Social, and Personal Services	91PGS.WK1 ALPHA.WK1
TOTAL		ALPHA.WK1

**TABLE 2: FLOW CHART FOR DATA COLLECTION AND CALCULATION
OF THE CONTRIBUTION OF AGRIBUSINESS TO GDP, HASHEMITE KINGDOM OF JORDAN, 1987-1991**

Action	Data Source	Worksheet
1. Value Added Data	National Accounts Section, Department of Statistics (alternative, Statistical Yearbook, and annual sectoral statistical publications.	AGBIZ.WK1 (blank)
2. Create ALPHA.WK1	Take ISIC template from AGBIZ.WK1, change title to Shares of Agribusiness by Economic Activity, as alphas for economic activities are calculated, link them the corresponding activity in ALPHA.WK1.	ALPHA.WK1
3. α_i for agriculture and mining	According to list given in section 2.1.	AGMIN.WK1, linked to ALPHA.WK1.
4. α_i for manufacturing, except for petroleum and repairs of machinery and equipment.	Section 2.1 list; Table 4.	MANUFAC.WK1, linked to ALPHA.WK1.
5. α_i for petroleum and repairs of machinery and equipment.	<i>Industrial Survey</i> ; Specialists in the Agriculture Section, Department of Statistics; ALPHA.WK1	FUEL&REP.WK1, linked to ALPHA.WK1.
6. α_i for construction	1988 <i>Industrial Census</i> ; Capital formation data by type of assets, National Accounts Section, Department of Statistics; ALPHA.WK1.	CONSTR.WK1, linked to ALPHA.WK1.
7. α_i for electricity and water	<i>Industrial Survey/Census</i> ; Agriculture Section, Department of Statistics; ALPHA.WK1.	ENERGY.WK1, linked to ALPHA.WK1.

TABLE 2 (cont'd)

Action	Data Source	Worksheet
8. α_i for restaurants	100%	Enter directly in ALPHA.WK1
9. α_i for hotels	Informal survey of 4- and 5-star hotels to discern the share of their output from food and beverage services; adjust for all hotels in Jordan.	Enter directly in ALPHA.WK1
10. α_i for Wholesale and Retail Trade	Value added by type of wholesale and retail trade multiplied by relevant agriculture, mining, and manufacturing α_i s from ALPHA.WK1.	06ALPHA.WK1
11. α_i for Transportation and Communication	Check first to see if new transportation survey data are available; obtain total value of output from Department of Statistics; data on use by economic activity in agriculture, mining, and manufacturing and estimate α_i using Equation 2.	TRANS&CO.WK1, linked to ALPHA.WK1
12. α_i for Insurance, Legal Activities, Accounting, and Advertising Service Activities	<i>Industrial Survey; Services Survey.</i>	BUSSVCS.WK1, linked to ALPHA.WK1
13. Calculate aggregated alphas for sector and sector groups (mining and manufacturing; agriculture, mining, and manufacturing)	Use alphas assigned to date and value added for economic activities to calculate the weighted average alpha for different sectors and groups of sectors.	AGTEMP.WK1

TABLE 2 (cont'd)

Action	Data Source	Worksheet
14. α_i for Financial Institutions	In AGTEMP.WK1, calculate aggregate alphas for each of the sectors or sub-sectors for which outstanding licensed bank credit (OLBC) is given; create 81ALPHA.WK1 with these alphas and OLBC data from the <i>Statistical Yearbook</i> ; multiply the aggregate alpha by the OLBC figure for its respective sector or subsector; add; and divide by total OLBC to get $\alpha_{\text{financial institutions}}$.	AGTEMP.WK1, linked to 81ALPHA.WK1, linked to ALPHA.WK1
15. α_i for Real Estate, Machinery and Equipment Leasing/Rental	<i>Services Survey</i> ; multiplied by value added from mining and manufacturing agribusiness activities, divided by GDP.	Enter directly in ALPHA.WK1
16. α_i for Producers of Government Services	Obtain from Department of Statistics value added information for: producers of government services, universities, University of Jordan, industrial cities, Ministry of Agriculture, Agricultural Education, and University of Science and Technology. From University of Jordan, data on the total compensation for teaching staff, staff and technicians, and laborers for all programs and research centers. Aggregate alphas from AGTEMP.WK1 also required.	91PGS.WK1, linked directly to ALPHA.WK1
17. α_i for Business, Professional, and Labor Associations	Obtain value added information for chambers of commerce, business associations, and labor unions from Department of Statistics; use aggregate α_i for mining and manufacturing given in AGTEMP.WK1	Enter aggregate alpha directly in ALPHA.WK1

TABLE 2 (cont'd)

Action	Data Source	Worksheet
18. Calculate agribusiness value added for each economic activity	Completed tables in AGBIZ.WK1 for Value Added by Economic Activity and Share of Agribusiness by Economic Activity; formulas should calculate the results in AGBIZ.WK1's third table, Agribusiness Value Added by Economic Activity.	AGBIZ.WK1
19. Percentage share of agribusiness in GDP	Total value added from agribusiness and GDP; calculation should be automatic in last row of Agribusiness Value Added table.	AGBIZ.WK1

TABLE 3 CALCULATION OF α_i FOR MANUFACTURING SECTOR ACTIVITIES WHOSE RAW MATERIALS INCLUDE AGRICULTURAL PRODUCTS

ISIC Category	Objective	Information/Steps/issues	Information Received	Formula for α_i
3211 Spinning, weaving and finishing textiles	Determine the percentage of natural fibers used for these activities (α_i). Since spinning and weaving are reported together and are two very different activities, with different compositions of raw materials, it is also necessary to determine the amount produced by one of these activities in order to apply the different α_i to each.	<p>1. Identify major spinning and weaving enterprise in Jordan: there is only one spinner; for weaving, there are several smaller enterprises, however, the entities are homogenous, so the numbers provided from the firm we contacted can be generalized for the activity as a whole.</p> <p>2. If the manufacturer is able to provide industry-wide information, it is preferable. For spinning, since there is only one firm engaged in this activity, the distinction was moot. By asking the percentage of natural fiber and total output, the share of agribusiness in this industry can be calculated. Total spinning output is also necessary to derive the output for remaining activities in this category.</p> <p>For weaving and finishing, the firm contacted is engaged in weaving, knitting, finishing, garment manufacturing. The manufacturer responded to our questions regarding natural content of fabrics and wearing apparel, indicating that on average in Jordan, only 20% of the fibers used in weaving, knitting, and manufacture of wearing apparel were natural. By subtracting spinning output from total output for 3211, output for weaving and finishing textiles can be determined.</p> <p>Total output for 3211 was obtained from the <i>Industrial Survey</i> for each year.</p>	<ul style="list-style-type: none"> ▶ percentage of natural fibers in spinning (90%) ▶ total output of spinning ▶ content of natural fibers in materials produced by weaving and finishing industry (20%) 	$\frac{.9y_{spin} + .2(y_{3211} - y_{spin})}{y_{3211}}$

21

TABLE 3 (cont'd)

ISIC Category	Objective	Information/Steps/Issues	Information Received	Formula for α_i
3212 Manufacture of made-up textile goods except wearing apparel 3213 Manufacture of knitted and crocheted fabrics and articles 322 Manufacture of wearing apparel except footwear	Determine the natural fiber content (%) in these activities to use as a proxy for $\alpha_{3212, 3213, 322}$	Enterprise contacted for 3211, also produces these goods. Manufacturer was asked to characterize production in these areas in terms of the average content of natural fiber.	► Industry-wide, the natural content of these all articles is 20 %.	$\% \text{ of natural fibers} = \alpha_{3212, 3213, 322}$

21

TABLE 3 (cont'd)

ISIC Category	Objective	Information/Steps/Issues	Information Received	Formula for α_i
3214 Manufacture of carpets and rugs	Determine the percentage of yarns and materials made from natural fibers in carpet and rug manufacturing in Jordan: these include wool, cotton, and jute.	<ol style="list-style-type: none"> 1. Identify principal carpet manufacturer to interview. 2. Ask manufacturer to characterize the content of natural fibers and materials used in carpet/rug production in Jordan. 3. If a characterization of the entire industry cannot be obtained, inquire about the content in their products and their market share. 4. The natural fiber content will serve as a proxy for α_i. 5. If neither #2 or #3 are answered clearly, as was the case in the interview for the 1987-1991 data, an approximation using the information given must be made. 	<ul style="list-style-type: none"> ▶ Most carpet production is from synthetic yarns, in general, comprised of 35% cotton. ▶ One company, produces wool carpets; it represents 5% of this firm's production. ▶ Firm's monthly use of cotton-blend yarn (8 tons), jute (30 tons), and wool (3 tons). 	<p>Only an approximation could be made regarding the content of natural fibers in carpet production in Jordan. Since only one company produces wool carpets, it was possible to estimate the percentage of wool in the total value of raw materials. The equation used to estimate this is given below:²⁵</p> $\frac{(10^3 \text{ JD/ton wool yarn})(\text{tons of yarn/year})}{\text{total value of goods purchased for intermediate use}}$ <p>For cotton and jute, however, it was not possible to calculate an exact number. Therefore, the proportion of wool to total raw materials was adjusted upward, resulting in an α_i of 10.2 percent. Although cotton and jute represent a much larger proportion of the raw materials, they are also much less expensive. Therefore, the 10.2 percent most likely underestimates the true proportion of value added from natural fibers in this industry, but based on the limited data it was not considered wise to use a higher percentage.</p>

²⁵ All wool yarn is imported and the price was arrived at using the 1991 External Trade Statistics for Jordan. By dividing total value of imports by the quantity imported for "yarn of carded sheep's or lamb's wool (worsted yarn) not put up for retail sale; dyed or printed" (BTN code 5377/B), the price in JD/kg and equivalently, 10³ JD/ton, are obtained. The "total value of goods purchased during the year for intermediate use" figure for category 3214 was obtained from the 1991 Industrial Survey, Table 4. To annualize the tons of wool used, an adjustment first had to be made for the seasonality of the production figures quoted. The input figures were given for March of 1993, one of the higher production periods for the year due to the increased demand household goods during the Ramadan holidays. Therefore, the yearly figure was set at 30 rather than 36 (3 tons x 12 months) tons per year.

TABLE 3 (cont'd)

ISIC Category	Objective	Information/Steps/Issues	Information Received	Formula for α_i
3321 Manufacture of furniture and fixtures, except primarily of metal 3322 Upholstery	Determine the percentage of wood and natural fibers used in production.	<ol style="list-style-type: none"> 1. Identify key manufacturer in this activity to interview regarding the percentage of wood and natural products in Jordanian furniture and upholstery production. 2. Alternatively, contact the Ministry of Trade and Industry to check for data characterizing raw materials and inputs used in these activities. 	<ul style="list-style-type: none"> ▶ Not able to schedule any interviews 	<p>Assumed α_{3221} to be 90 percent and α_{3222} to be 80 percent.</p>
3523 Manufacture of soap and cleaning preparations, cosmetics	Determine the size of the soap industry in Jordan and on average, the percentage of animal and vegetable products used in its production.	<ol style="list-style-type: none"> 1. Identify major soap producer, obtain annual report and make arrangements for telephone or personal interview with a director. 2. If manufacturer is able to provide industry-wide information, it is preferable. First pose questions regarding the industry as a whole: on average, what is the size, in JDs, of annual soap production in Jordan? How much of the raw materials are "natural" or agricultural products? If they do not know the size of the economy as a whole, ask for their market share. 2. Annual report gives total output in both quantity and JDs for 1987-91: also gives quantity (tons) of soap produced. 3. Company manufactures six other products in addition to soap and output in terms of JDs is only reported as a total for all the products. Assuming that the share of output in terms of JDs is equal to the proportion of tons of soap to total tons produced by the company, the value of soap production is calculated. 4. Ask if there have been any major changes over the period you are looking at to ensure that the assumptions remain valid. 	<ul style="list-style-type: none"> ▶ 100% of raw materials are agricultural products—vegetable oils and tallow ▶ market share is 65% ▶ annual soap output (tons) ▶ annual total output (tons) ▶ annual total output (JDs) 	$\frac{Q_{soap}}{Q_{total}} \times y(firm)_{total} = y(firm)_{soap}$ $\frac{y(firm)_{soap}}{.6} = y(Jordan)_{soap}$ $\frac{y(Jordan)_{soap}}{y(Jordan)_{3523}} = \alpha_{3523}$

12

TABLE 3 (cont'd)

ISiC Category	Objective	Information/Steps/Issues	Information Received	Formula for α_i
3529 Chemical products not included elsewhere	Matches made of both wood and paper are included in this category. There is one producer in Jordan. The 1987-91 estimations did not include this category since its value added is quite small and there was not time to visit the manufacturer.	<ol style="list-style-type: none"> 1. Determine the percentage of raw materials comprised of wood and cardboard. 2. Determine the firm's total value of production (output in JDs). 3. Using total output for category 3529, taken from the <i>Industrial Survey</i>, alpha will be the firm's total value of production, multiplied by the share of wood and paper in the raw materials, then divided by total output for 3529. 	(no information received to date)	$\frac{X_{wood, paper} y_{matches}}{y_{3529}} = \alpha_{3529}$

AL

TABLE 4 Calculation of α_i for Utilities, Infrastructure, and Business Services

Activity	Worksheet for α_j data	x_j	y_i	Worksheet for calculation of α_i
41 Electricity	ALPHA.WK1	<i>Industrial Survey,</i> "Intermediate Consumption of Water, Electricity, and Fuel by Industrial Activity, 1987-91	<i>Industrial Survey,</i> "Gross Value Added by Industrial Activity," Total Production.	ENERGY.WK1
42 Water	ALPHA.WK1	Crop and Livestock Specialists, Agriculture Section, Department of Statistics; <i>Industrial Survey,</i> "Intermediate Consumption of Water, Electricity, and Fuel by Industrial Activity, 1987-91	<i>Industrial Survey,</i> "Gross Value Added by Industrial Activity," Total Production.	ENERGY.WK1
05 Construction	ALPHA.WK1	<i>Industrial Census, 1988,</i> "Fixed Assets Value Added During 1988 by Kind of Industrial Activity, Non-Residential Buildings;" columns—assets bought and additions and improvements.	<i>Construction Statistics,</i> Distribution of Value Added, Gross Output.	CONSTR.WK1
71 Transportation	ALPHA.WK1	<i>Industrial Survey,</i> "Production Expenditures on Utilities and Services, by Kind of Industrial Activity," Transportation, freight, and storage.	Request from National Accounts Section, Department of Statistics	TRANS&CO.WK1
72 Communication	ALPHA.WK1	<i>Industrial Survey,</i> "Production Expenditures on Utilities and Services, by Kind of Industrial Activity," Telecommunications and Postal Services.	Request from National Accounts Section, Department of Statistics	TRANS&CO.WK1

22

TABLE 4 (cont'd)

Activity	Worksheet for α_j data	x_j	y_i	Worksheet for calculation of α_i
81 Financial Services	AGTEMP.WK1	<i>Statistical Yearbook</i> , "Sectoral Distribution of Outstanding Licensed Banks' Credit."	<i>Statistical Yearbook</i> , "Sectoral Distribution of Outstanding Licensed Banks' Credit," total.	81ALPHA WK1
82 Insurance	ALPHA.WK1	<i>Industrial Survey</i> , "Production Expenditures on Utilities and Services, by Kind of Industrial Activity," Commissions paid for insurance and Commissions paid for insurance agents.	<i>Services Survey</i> , "Gross Output, Intermediate Consumption and Value Added by Economic Activity."	BUSSVCS.WK1
8321 Legal Activities	ALPHA.WK1	<i>Industrial Survey</i> , "Production Expenditures on Utilities and Services, by Kind of Industrial Activity," Legal Expenses.	<i>Services Survey</i> , "Gross Output, Intermediate Consumption and Value Added by Economic Activity."	BUSSVCS.WK1
8322 Accounting	ALPHA.WK1	<i>Industrial Survey</i> , "Production Expenditures on Utilities and Services, by Kind of Industrial Activity," Auditing.	<i>Services Survey</i> , "Gross Output, Intermediate Consumption and Value Added by Economic Activity."	BUSSVCS.WK1
8325 Advertising Service Activities	ALPHA.WK1	<i>Industrial Survey</i> , "Production Expenditures on Utilities and Services, by Kind of Industrial Activity," Publicity/Advertisements.	<i>Services Survey</i> , "Gross Output, Intermediate Consumption and Value Added by Economic Activity."	BUSSVCS.WK1

126