

REPORT SUMMARY

- A. 1. Project Title and Contract Number: Employment and Unemployment in the Developing Countries [AID/CSD 2492]
2. Principal Investigator, Contractor and Mailing Address:
Professor Gustav Ranis
Yale University
New Haven, Conn. 06520
3. Contract Period (as amended): from 6/30/69 to 6/30/74
4. Period covered by Report: from 6/30/72 to 6/30/73
5. Total A.I.D. funding of contract to date: \$993,520
6. Total expenditures and obligations through previous contract year:
\$624,436
7. Total expenditures and obligations for current year: \$216,679
8. Estimated expenditures for next contract year: \$143,332

B. Narrative Summary of Accomplishments and Utilization

A comparative study, tracing the historical growth, employment and trade patterns of Korea and Taiwan was completed. Another study related employment, production, income distribution and capital formation in Chile. A third looked into the use of capital and labor in Kenyan manufacturing plants. Research on employment generation in Zaire, Ghana and Brazil was extended. Sectoral investigations of technological change and choice in Indian agriculture, as well as Kenyan, Korean and Taiwanese manufacturing were completed. A detailed analysis looked into the differences in labor utilization between large and small firms in Colombia. Finally, the effect of labor market conditions and education on employment and migration was investigated. Still to be completed are the country studies of Zaire, Ghana and Brazil and a synthesis of the methods used and results obtained during the contract.

Our research indicates that there is considerable scope for simultaneously improving the employment and output picture if appropriate government policies are followed.

BEST AVAILABLE DOCUMENT

ANNUAL RESEARCH REPORT

A. General Background

While much of the emphasis among LDC policy makers after the Second World War was on aggregate output and growth, it has become increasingly clear that lack of adequate employment opportunities constitutes an important economic and human problem. Even in countries which have experienced respectable rates of growth of income over the recent past, employment has not kept up. Open unemployment and underemployment (i.e., inefficient utilization) of labor and the demographic pressures which fuel it have, in fact, become among the most pressing problems of the developing world.

The Yale Economic Growth Center's earlier country and comparative studies suggest that an analysis of the relation between employment and output generation requires an understanding of the growth phases in economic development (e.g., import vs. export substitution) as well as of the type of LDC considered (e.g. labor supply in Asia vs. land supply in Africa, large and domestically-oriented, such as India vs. small and trade-oriented, such as Taiwan). Other Center studies have focussed on the relative importance of the major economic sectors (e.g., agriculture, industry and services) and their interactions in the development process. For instance, we have found that, in a labor surplus economy, it is necessary to achieve sustained productivity increase in the large agricultural hinterland if the total economy is to move forward and total employment is to increase. Moreover, it is clear that sectoral characteristics and institutions (e.g. land tenure relations; government pricing policies; the existence of competing public, multinational and private firms) influence the relation between growth and employment.

This earlier work has led us to believe that the relation between employment and output can best be studied by a combination of country studies

and specific sectoral and functional studies.

B. Statement of Project Objectives as Stated in the Contract

The Center's research project is designed to empirically investigate the presumed trade-off between output and employment. The objective is to determine whether such a conflict has in fact existed historically, whether it will inevitably exist in the future, and what policy conclusions follow.

More specifically, the objective was to undertake two main lines of research. The first involves ten country and comparative studies, covering the major types of LDC's. Questions to be investigated include: the relevance for employment and output generation of different growth phases; the sectoral responsiveness of employment to output changes; the relative labor intensity of different sectors or of different scales of firms within a sector; the transferability and adaptability of foreign technology to local conditions; the relation between price incentives and employment. The countries studied are Korea, Taiwan, India, West Pakistan, Kenya, Zaire, Ghana, Colombia, Chile and Brazil.

The second line of research involves six sectoral and functional studies. Here, the areas to be investigated include: the choice and adaptation of technology; pricing and government policies affecting employment; sectoral growth in industry, agriculture and services, focussing on factor intensity of production; research in agriculture relating technical change to the output and employment generated; education--its input requirements, its effects on output and on employment.

A concluding study of the project will compare and synthesize the approaches and results of the country and sectoral-functional studies.

C. Continued Relevance of Objectives

There has been no basic change in the project's objectives. In many cases, however, the relation between employment or unemployment and output has naturally led to questions of income distribution. For example, A. Berry's study of unemployment in the service sector has also identified the kinds of people who are unemployed. And J. McCabe's study of urban employment in Zaire treats the distribution of labor incomes in Kinshasa.

D. Accomplishments to Date

1. Much of the existing work on unemployment in LDC's has noted that output has often grown faster than employment opportunities. The usual conclusion has been that there very likely exists a conflict between high rates of growth and high levels of employment or a more equal distribution of income. But before we can draw any such conclusion, we must know more about the technical choices open to the country, the relative prices and other incentives facing different producers and the relation between the major sectors of production.

While the Center's main research orientation has been empirical, it is helpful to start with a discussion of the theoretical models used to explain the observed phenomena. The main findings of the country studies are presented next, followed by the analysis of technology choice and transfer, and finally by the individual sector studies and an investigation of the determinants of labor supply.

a. THEORETICAL BACKGROUND

Fei and Ranis have developed a model linking agricultural production to urban employment which illustrates the potential complementarity between output and employment in a labor surplus economy.¹ Employment can increase

¹J.C.H. Fei and Gustav Ranis, "Development and Employment in the Open Dualistic Economy," Growth Center Discussion Paper no. 110, April 1971.

at the same time that output expands, either by increasing agricultural productivity (where the mass of the population is), or by expanding labor intensive exports.

The relative optimism suggested by this model is dampened on consideration of some other views such as those of R. Brecher of the Economic Growth Center or F. Stewart and P. Streeten of Oxford University. Stewart and Streeten represent a point of view, frequently found in the literature, that the goals of output and employment growth might not be achieved simultaneously.² But the crucial assumptions of their model are the scarcity of capital and imperfections in the capital market. If these institutional constraints are not binding, then there is not necessarily a conflict between output and employment. G. Fields of the Economic Growth Center, has been working with N.H. Stern on a formal analysis of the circumstances under which there are real tradeoffs between output and employment objectives in the process of economic development. Fields and Stern take as their starting point the Stewart-Streeten model, and investigate the implications for employment when there is limited capital capacity and the government might or might not have sufficient policy tools. In effect, like Fei and Ranis, they have theoretical reasons to suspect that growth and employment can be made into complementary objectives through policy changes.

R. Brecher has developed an alternative model of open unemployment, based upon an institutionally given floor to the real wage.³ Here, employment might decrease even though welfare increases, and restricted trade might

²F. Stewart and P. Streeten, "Conflicts Between Output and Employment Objectives in Developing Countries," Oxford Economic Papers, July 1971.

³Brecher, R., "Minimum Wage Rates and the Pure Theory of International Trade," Quarterly Journal of Economics, forthcoming.

improve welfare over free trade even when the home country possesses no monopoly power in trade.

Brecher's theoretical results depend upon his particular assumption of an exogenously specified floor to the real wage and clearly emphasize the importance of an empirical test of his assumption. The goal of this research project, then, has been to determine the existence of such institutional constraints, to study the problem of employment or unemployment in a particular historical case, i.e., Ghana, and to provide policy suggestions for reducing unemployment. One of the implications of Brecher's study, for example, is that welfare might be increased when a minimum wage is imposed even though employment will generally decrease. But this increase in welfare is not the best that can be done. The optimal policy would have no binding minimum wage. Moreover, in the optimal case, there would be no conflict between output and employment.

Empirical evidence on the historical pattern of growth and on particular countries is crucial for distinguishing the important institutional constraints and for suggesting effective employment policies. The Fei-Peris and Brecher theoretical models need not be inconsistent. Rather, it is necessary to study the nature of the growth path in order to understand the relation between output and employment for different types of LDC's.

The International Labor Office, The World Bank and OECD have undertaken a number of country studies on the problem of employment and underemployment. While such reports are useful and emphasize the relation between prices, labor use, choice of technology, output, etc. they often do not provide the

kind of detail that is necessary. To understand the relationships between income distribution, consumption patterns, employment and sectoral output, we need a closer look at micro data. To start with, we need to know how and why employment and the use of capital differ among different scales within the same industry. And we need to know the degree of technology choice in industry as well as in agriculture. It is in these directions that the focus of our work has moved.

b. COUNTRY AND COMPARATIVE STUDIES

Taiwan and Korea Fei and Ranis find that these two countries are exceptions to the usual LDC experience of poor employment performance during the 50's and 60's.⁴

Their analysis led to the identification of two distinct sub-phases of transition growth, i.e. import substitution initially, followed by export substitution. The investigation showed that the import substitution sub-phase can prepare the ground through entrepreneurial maturation and infra-structural creation--but that both growth and employment performance are likely to be adversely affected by the policy package typically deployed; moreover, that the later advent of the export substitution sub-phase permitted the full use of the supply of unskilled labor to generate new labor intensive industrial exports which, along with technology changes, permitted a substantial enhancement of the employment and growth performance--finally leading to a solution of the "employment problem" as the so-called turning

⁴J.C.H. Fei and G. Ranis, "A Model of Growth and Employment in The Open Dualistic Economy: The Cases of Korea and Taiwan," May 1972, paper presented at the Employment Conference, Economic Growth Center 1972.

point was reached in both countries by the end of the 60's.

By differentiating between these two typologically similar cases, Fei and Ranis were able, moreover, to demonstrate that economies which have a substantial agricultural hinterland (unlike Hong Kong or Singapore, for instance) cannot afford to disregard the problem of rural mobilization in solving the employment/output problem--except at substantial cost in excess reliance on foreign capital inflows and excess capital intensity in the industrial sector itself. Their analysis thus demonstrates the potential complementary between output and employment objectives in at least one type of LDC and indicates the nature of optimizing policy behavior in that context over time.

Kenya H. Pack has concentrated on the choices of production techniques in Kenyan manufacturing.⁵ It is clear that adjustments in the relatively small manufacturing sector could not solve the employment problem by itself. But it is still noteworthy that the relatively large growth in manufacturing output had only a weak employment impact. This was usually attributed to the adoption of capital intensive techniques, due to the lack of other efficient choices, or to incorrect relative factor prices.

Using data for individual plants, Pack's major findings have been: (1) There is considerable variation in feasible production methods, and much of the choice involves modification of processes to allow manual rather than machine oriented material handling. Moreover, there is substantial choice of major production equipment: e.g., new versus old and high speed (volume) versus low speed (volume) equipment.

⁵H. Pack, "The Substitution of Labor for Capital in Kenyan Manufacturing," mimeograph, May 1972.

(2) The adoption of labor intensive production methods will be dependent on two factors: the existence of factor prices that are reasonable; and perhaps more important, the existence of a management capable of innovative discovery and use of such equipment.

(3) Substantial gains in labor productivity without capital deepening occur due to the existence of considerable (disembodied) productivity gains and the gradual elimination of excess capacity of both capital and labor. Organization improvements appear to be very important for relatively labor intensive processes. Moreover, the managers of foreign firms are among the most adept at increasing labor productivity through reorganization.

These results have an important policy implication: If the types of managerial expertise needed to exploit available opportunities can be systematically built up, expensive and time consuming research on new labor intensive techniques may be unnecessary.

Pack's work relies on actual plant data rather than aggregate published data. Therefore, the evidence that considerable economically efficient substitution between capital and labor is possible should be more convincing to sceptics than previous claims. This conclusion is supported by other research, e.g. Louis Wells' of the Harvard Graduate School of Business.

Ghana Brecher has extended his theoretical model of open unemployment to introduce particular economic and institutional features relevant to Ghana.⁶ First, he has studied the implications of sharecropping, which is an important land holding arrangement in Ghana's major sector, cocoa. The purpose of this extension was to show that, when share cropping and wage rigidity exist together: (1) both disguised and open unemployment may arise simultaneously; and (2) policy and structural changes that

⁶R. Brecher, "The Labor-and-Land Surplus Economy (Ghana)," mimeograph, E.G.C., Yale University, October 1972.

decrease one of these types of unemployment may increase the other.

These results signal the importance of analyzing disguised and open unemployment simultaneously within the same framework, rather than separately within different models, as is often done.

Second, Brecher gives prominence to the implications of surplus land as an important aspect of the Ghanaian economy. He argues that (1) land and labor surplus are not mutually exclusive phenomena when capital is scarce; and (2) that the way to increase labor employment depends crucially on the relative capital-intensity of cocoa.

Because of the importance of cocoa's relative capital intensity, Brecher has collected data on productive inputs used in cocoa and other sectors. This data, along with information on land availability, wage rigidity, sharecropping arrangements and capital mobility, will be further analyzed during the coming year.

Zaire James McCabe has just completed a study of employment and the distribution of labor incomes in urban Zaire.⁷ In this study, he has addressed himself first to the problem that summary measure of wage income inequality, computed for Kinshasa, the main urban area in Zaire, tend to overstate the degree of total labor income inequality among sharing units of comparable size. McCabe argues that this is true for two reasons: (1) earnings from female commercial activity are not recorded in the available statistics; and (2) the 1960 U.N. definition of household upon which the measures of inequality are based understates the size of the actual sharing unit. Data taken from the 1967 Socio-Demographic Survey

⁷"The Distribution of Labor Incomes in Urban Zaire," Review of Income and Wealth, forthcoming.

of Kinshasa and the 1970 household budget study are used to test these hypotheses regarding short-run income inequality.

The policy observation is made that, while modernization of the urban commodity distribution system may provide a disincentive for sharing and a reduction in opportunities for female employment, investment in the non-service sectors may equalize the secular income distribution for a given migration cohort. Evidence of unskilled migrants moving from service to non-service sector employment in response to increased labor demand is presented. This is accomplished by supplementing sample survey data with time series on aggregate employment by sector for Kinshasa.

Chile M. Mamalakis has studied the relationship between employment and production on the one hand, and income distribution on the other hand, for the period 1960-72.⁸ Due to lack of adequate time series data, he has been able to analyze the relationship of employment and capital formation only for 1966.

The major findings have been: (1) the analysis of employment requires integration with an understanding of output effects in a general equilibrium framework. (2) Examination of employment, distribution and capital formation by function demonstrates that Chile neglected or penalized food production, quality improvement and financial intermediation. The result has been to hurt both employment and output performance.

⁸M. Mamalakis, "New Dimensions in National Accounting with Special Reference to Chile," mimeograph, Department of Economics, University of Wisconsin-Milwaukee, Jan. 1973.

In a related study of Chile's service sectors Mamalakis has found that the distribution of benefits from the banking, transportation, utility, and education sectors have been highly concentrated.⁹ "The services have catered almost exclusively to the cities and its privileged groups, with the rural and marginal segments not only neglected but also frequently suffering absolute and relative losses in benefits. The minor improvement in the distribution of benefits under President Allende affected the intra-city rather than the urban-rural distribution pattern." This pattern thus deterred economic growth and did not materially assist with the redistribution intended, at least in the short term.

Brazil W. Baer has assembled considerable employment data based on surveys and the 1970 demographic census. The industrial and service censuses will appear only towards the end of the year. Nonetheless, with sample data that he has collected from firms in Rio de Janeiro and Sao Paulo, he can now document the relation between company ownership, the transfer of technology, skill levels, and employment. He is now in the process of writing up his results. The first draft of his manuscript should be ready by the beginning of 1974.

c. SPECIFIC SECTORAL AND FUNCTIONAL STUDIES

1. The Flow of Technology

An important side benefit of the Fei-Ranis study of Korea and Taiwan was the insight gained with respect to the existence of substantial technological

⁹ M. Mamalakis, "Services in the Contemporary Latin American City: The Case of Chile," mimeograph, Department of Economics, University of Wisconsin-Milwaukee, Sept. 1972.

flexibility for given output mixes, so often disputed in the literature and by policy-makers. The distinction between borrowing from a shelf of technology and modifying or adapting was found to be theoretically and empirically useful.¹⁰

Both historical and cross-sectional evidence indicates that there exists wide scope for labor-using adaptations of various kinds of the overall policy setting favors the search for such technical change. The potential for technical change seems to be more pronounced the closer we are to the finished product stage of processing.

Micro-economic data on the role of technology choice across scales of industry as well as historically was presented for Korea, Taiwan, Japan, as well as for Colombia, Mexico, Kenya, etc. The data sources are given in Appendix A.

2. Technical Change and Employment in Agriculture

Robert Evenson has reported the results of his research on employment and productivity change in "Labor in the Indian Agricultural Sector" (1972).¹¹ His work has focussed on three aspects of the Indian experience over the last decade. First, total factor productivity indices for the agricultural sector have been calculated for each State in India. These measure the regional disparities in productivity change in a more meaningful sense than standard yield per hectare measures. Second, micro-data from producers have been

¹⁰G. Ranis, "Technology Choice, Adaptation and its Impact on Industrial Sector Labor Absorption in Developing Countries: A Review of Evidence," mimeograph, EGC, Dec. 1972.

J.C.H. Fei and G. Ranis, "Technology Transfer, Employment and Development", forthcoming in Sellekaerts (ed.), Economic Development and Planning.

¹¹R. Evenson, "Labor in the Indian Agricultural Sector," mimeograph, Economic Growth Center, Yale University October 1972.

utilized to investigate substitution elasticities between factors of production. Then, an analysis of the effects of technical change and subsidized mechanization on the demand for labor is undertaken. Real wages by state over time are measured and related to productivity gains in agricultural and non-agricultural labor.

The total factor productivity measures show a pattern of productivity gain that differs somewhat from that reflected by simple yield measures. In particular it shows a somewhat more diffuse pattern, with some producing regions only reflecting substantial gains. The study reports, for the first time, measures of the elasticity of substitution between labor and other factors of production. A relatively low long run substitution elasticity (.6 to .7) is estimated between labor and bullock labor, fertilizer and seeds, and traditional implements, indicating that a relative rise in the wages of laborers will induce very little substitution of these factors for labor in production. The elasticity of substitution between labor and capital implements (tractors) is estimated to be relatively high, however (1.44). Thus artificially high wages and/or low machinery prices could result in the substantial substitution of machinery for labor, with serious implications for both output and employment in the sector.

Some controversy over the extent to which real wages have changed over the 1961-71 period in India still exists. The evidence assembled in this study shows quite clearly that real wages have risen by up to 40 percent in the states which have experienced the largest productivity gains (Punjab, Haryana, Gujarat) and have actually fallen in states with little or no productivity gains (West Bengal and Bihar). A model of wage determination is developed to show the expected relationship between

productivity and wages. The key determinant of the positive correlation is shown to be the demand for product relationship. A region with a very elastic demand will experience an increase in the demand for labor when it achieves productivity gains. It will also have the effect of lowering product prices and decreasing the demand for labor in regions where productivity gains have not been achieved.

The policy implications of uneven productivity gains are quite important for they lead to uneven shifts in labor demand which show up quite dramatically in wages, labor, migration and unemployment. This work shows that policy decisions are required with respect to modifying the regional pattern of productivity gains as well as in dealing with labor markets generally in disequilibrium.

Evenson uses the available census and survey data on employment and unemployment in the agricultural sector. Wage data is collected by state and district for several years. Individual farm data on labor and other inputs is used to estimate farm production functions.

3. Industrial Sector Employment

A. Berry's analysis of small scale industry in Colombia, and its relation to large scale industry, is central to the output/employment question.¹² It is noted that, despite a rather lengthy history of industrial growth, the majority of the Colombian manufacturing labor force (including in repair) is found in cottage-style establishments (less than five workers). The share of this sub-sector of industry appears

¹² Albert Berry, "The Relevance and Prospects of Small Scale Industry in Colombia," Growth Center Discussion Paper No. 142, April 1972.

not to have been declining significantly in recent years. Looking across plant sizes in industry, the largest plants have labor productivity eight or nine times higher than in the smallest self-employed category and about three times as high as plants with five to nine workers. The output-capital ratio appears to go in the other direction, however, i.e., to be higher for small firms, although the relationship with size over the small and intermediate ranges is not ascertainable with precision to date. In most two-digit sectors small scale industry has retained at least its absolute number of workers (the exception is textiles and footwear) and in many the employment is rising rapidly, as in food products, and metal products, especially transportation equipment and manufacturing repair.

The tremendous differences in labor productivity imply, at first glance, substantial employment opportunities in a shift of the size structure away from the larger towards the smaller firms, with an accompanying increase in total output. But the feasibility of such a shift depends on the flexibility of the composition of industrial output and possible differences in dynamic efficiency which are not captured in static factor productivity comparisons. The figures suggest rather strongly that one factor weighing against rapid employment expansion and improved income distribution in recent years has been the focus on industries characterized by large firms and high capital intensity and the relative disinterest of public policy in the smaller firms. An important question for policy is the extent to which small scale producers can be linked to international trade (exports) in a situation in which market intermediaries are not usually efficient aggregators of small scale production for such purposes. Given the closeness of the relationship between size and capital intensity, there

exists doubt that industrial exports will contribute much to the unemployment problem unless small scale firms can somehow become part of this phenomenon.

Pack has also been concerned with examining the possibilities of substituting labor for equipment in the production process. His cross-country study is based on detailed evidence collected at the plant level by UNIDO for a number of less developed and semi-developed countries.¹³

Unlike most analyses of substitution possibilities he considers only efficient production points. He finds elasticities of substitution that substantially exceed unity, i.e., in the upper range of most studies. Moreover, plant visits in Kenya allowed him to identify equipment currently used and a comparison with that available in advanced countries. There exist quite noticeable differences between the type of equipment in place and that currently available, i.e. contrary to what is often suggested, Kenyan manufacturing uses less capital intensive methods of production than many firms in other countries.

From his study, Pack draws several policy conclusions: It is unlikely that a change in relative factor prices can have much immediate impact on production methods since capital already in place is likely to have limited substitution possibilities. Different relative prices can only affect expansion decisions. However, one potentially important effect may be the encouragement of multiple shift production which can result in a substantial increase in labor intensity even where the basic one-shift production process seems to offer limited substitution.

¹³H. Pack, "The Employment-Output Trade-off in LDC's: A Microeconomic Approach," Growth Center Discussion Paper No. 179, June 1973

Over the longer run, however, changes in relative prices could lead to more one-shift labor absorption as well in view of the high estimates of the elasticity of substitution found in this study. One constraint on such changes, often referred to in the literature should be considered, i.e., the possibility that capital intensive processes substitute capital for skilled labor. Pack has found only limited evidence to support this contention. If this were a generally important phenomenon, increasing labor intensity could be envisioned as a process in which skilled labor grew relative to unskilled labor with possibly adverse distributional impact. The immediate effect of such a displacement would depend on the partial elasticities of substitution among factors of production and the degree of factor market competitiveness.

G. Fields has undertaken two studies designed to throw light on the interactions of the labor market and employment. The first¹⁴ is a modification of Harris and Todaro's well-known model of rural-urban migration.¹⁵ The Harris-Todaro model predicts considerably higher unemployment rates than actually observed by Turnham¹⁶ and others. Fields takes into account the possibility of underemployment in a low productivity service sector, the job search process, labor turnover and preferential treatment by employers of the better-educated. He finds that the open unemployment rate should be lower than that predicted by the simple model. But even so, we should not

¹⁴G. Fields, "Rural-Urban Migration, Urban Unemployment and Underemployment, and Job Search Activity in Less Developed Countries," Growth Center Discussion Paper No. 168.

¹⁵Migration, Unemployment and Development: A Two-Sector Analysis, American Economic Review, March 1970.

¹⁶D. Turnham, The Employment Problem in Less Developed Countries, OECD, 1971.

assume that the employed are fully occupied or that the distribution of income is equitable.

In a second study, Fields investigated the relation between the private demand for education, labor market conditions and the social returns to education.¹⁷ His main conclusion was that the demand for education is not a smoothly declining function of the size of the educated labor force. Rather, the private returns to education and hence the demand might be expected to remain the same or even rise as more persons are educated, depending on the workings of the labor market. In such a case, subsidization of education might increase rather than decrease unemployment and income disparities.

2. The detailed analysis, with the empirical evidence on which it is based can be obtained by referring to the Growth Center Discussion papers appended to this report.

3. No modification in research design. The publication of the Brazilian census data was delayed, delaying that particular study.

E. Dissemination and Utilization of Research Results

1. The Growth Center Discussion Papers have been circulated throughout the less developed world as well as in the U.S. and to international agencies dealing with development. Through the Growth Center Library's extensive exchange program contacts are maintained with 175 LDC institutions

¹⁴G. Fields, "The Private Demand for Education in Relation to Labor Market Conditions in Less Developed Countries," Growth Center Discussion Paper.

and scholars. The USIA, is seeking permission to reprint Ranis' "Industrial Sector Labor Absorption" which appeared in the March 1973 issue of Economic Development and Cultural Change. In addition, a number of our staff have made presentations at conferences.

Use of Research Materials at conferences or in books

Markos Mamalakis, "Services in the Contemporary Latin American City: The Case of Chile," paper presented at the 40th Congress of Americanists, September 1972, Rome.

"New Dimensions in National Accounting with Special Reference to Chile," paper presented at the Development Center of the OECD Conference on "National Accounts and Development Planning in Low Income Countries", November 1972.

"Income Redistribution in Chile Under Salvador Allende," paper presented at the Western Economic Association Meetings, August 1973.

Howard Pack and Gustav Ranis, presented papers at an AID sponsored conference on the role of technology in development. The papers were published by AID in the summer 1972. Pack also presented his paper in Kenya at a seminar of the Institute for Development Studies, Nairobi.

Gustav Ranis presented papers at (1) an ILCORK Conference in Korea which was published in a volume of papers on the Second Five Year Plan by the Korean Planning Board.

(2) A SEADAG Conference in Atlanta

(3) A Princeton Conference on technology and employment.

(4) A seminar with Robert McNamara and IBRD officials, on technology choice and employment, February 1973.

The Growth Center holds regular seminars, open to the Yale faculty, research staff, students and visitors, which have focused in substantial part on employment related topics.

October 9, "Effects of Factor Market Distortions on Differential Growth,"

Yair Mundlak

October 23, "The Private Demand for Education in Relation to Labor Market Conditions in Less Developed Countries," Gary Fields

October 30, "Differential Fertility, Distribution and Development,"

Simon Kuznets

December 14, "Land Productivity and the Employment Problem of Rural Areas: The Case of Paktia/Afghanistan," Egbert Gerken

January 4, "Agricultural Productivity in India," D. Jha and Robert Evenson

January 29, "The Economics of Tenancy Contracts on Philippine Rice Farms,"

Richard Burcroff

February 1, "Rural-Urban Migration, Urban Unemployment, and Job-Search Activity in LDC's," a discussion of Gary Field's paper.

February 22, "An empirical Analysis of Migration in Africa," Don Heisel

February 26, "Income Distribution, Growth, and Employment in Puerto Rico:

Re-examination of a 'Successful' Development Strategy," Richard Weisskoff

March 1, "Capital Accumulation, Employment, and Size Distribution of Income," a discussion of James McCabe's paper.

March 8, "The Labor-and-Land Surplus Economy (Ghana)," a discussion of Richard Brecher's paper.

April 9, "Capital Utilization and Investment," Gordon Winston

April 30, "Productivity Change in Indian Agriculture, 1953-1971," Robert Evenson

May 4, "A Re-Analysis of the Harris-Todaro Model," T.N. Srinivasan.

2. Howard Pack's results on technological choice are being used in the Industrial Labour Court in Nairobi in adjudicating wage disputes. Many of the staff have worked with LDC institutions and personnel. The research findings have been disseminated through them. Moreover, more than 250 civil servants and economists from the developing countries have gone through a special 1-year training program (The International Foreign Economic Administration or IFEA program) which the Center has administered since the late 1950's. Most of the alumni of this program are now in responsible policy-making positions with strong personal ties to the Center.

All the staff members have spent time in LDC's where they have been associated with LDC institutions and have worked with high level government officials and policy makers specifically on contact-related concerns. For example, W. Baer has active links with the Instituto de Pesquisas Economicas in Sao Paulo, Brazil. R. Brecher worked with economists at the Institute of Statistical, Social and Economic Research at the University of Ghana in Legon. A. Berry has a long involvement with numerous Colombian institutes. R. Evenson worked with the Indian AID mission and various agricultural research station. Moreover, he has worked extensively with numerous Indians both at Yale and in India. J.C.H. Fei has worked intensively with both the Academia Sinica and the CAECD in Taiwan. G. Fields and H. Pack have contracts at the Institute of Development Studies in Nairobi. J. McCabe has worked with the AID mission in Zaire and, as well, has contacts with people in the National Institute of Statistics, The National Organization for Research and Development and other government bureaus. G. Ranis has long experience working with Korean economists and government officials and is a member of the KDI Foreign Advisory Board. More recently, he consulted for the Mexican government on employment. Just this past summer, he has

headed the ILO Comprehensive Employment Strategy, mission to the Philippines.

3. Conferences focussing on one or two central papers to which LDC policy makers and scholars are invited could be considered in the future.

4. Our own view, is that LDC participation cannot be forced at an early stage of such a project. Funds should be made available for use in the second or third year of a project if LDC scholars become interested organically in participation perhaps on the basis of a conference discussion cited in (3) above.

F. Statement of Expenditures and Obligations and Contractor Resources

	<u>Contract Budget 1972-73</u>	<u>Actual Expenditures 1972-73</u>	<u>Obligations Incurred 1972-73</u>
SALARIES			
Professional	\$ 36,675	\$ 37,037	\$ -0-
Research Assts.	25,778	21,952	-0-
Adm., Sec., Cler.	31,841	29,019	-0-
FRINGE BENEFITS	11,697	9,853	-0-
OVERHEAD	62,234	54,778	-0-
CONSULTANTS	14,508	16,704	-0-
TRAVEL & ALLOWANCES	22,400	19,625	2,330
PUBLICATIONS	1,750	1,091	543
OFFICE SUPPLIES	15,750	14,435	43
DATA PROCESSING	7,750	2,378	-0-
DATA COLLECTION	<u>7,997</u>	<u>5,946</u>	<u>945</u>
TOTAL	\$238,380	\$212,618	\$3,861

NOTE:

There have been no significant problems relating to manpower, travel, etc. made available by these fund allocations. Scheduled work and expenditures have proceeded approximately as projected although it may be noted,

that, in general, expenditures ran somewhat below projections on most of the lines associated with non-professional personnel. There was a significant underexpenditure for computer use due in part to the availability of new and more sophisticated in-house calculating equipment or a substitute. Project management, staffing, and facilities did not deviate from prior forecasts.

G. Work Plan and Budget Forecast for Coming Year

1. a. Country Studies

J. McCabe is now undertaking a study of the impact of the deteriorating transport infrastructure on rural employment in Zaire. This study is based on producers-price, market surplus, family-labor and other data taken from the 1970-71 agricultural census.

R. Brecher will be using production input data to compute and rank the capital-intensities of cocoa and the other major sectors in Ghana. He will also empirically test the important assumptions of his labor-and-land surplus model.

M. Mamalakis plans to return to Chile for 3-4 weeks in order to complete his work on Chile. He expects to have a 150 page study ready by September 1974.

W. Baer now has both sample data and access to the 1970 census. He will spend the year analyzing the relation between technology choice and employment trends in Brazil.

b. Synthesis of the Approaches and Results

Once the major part of the employment project is completed, J.C.H. Fei and G. Ranis will synthesize the results. They will try to summarize the state of our understanding of the relation between employment

and output in different types of developing countries. They will also comment on the usefulness of the microanalytic approach we have followed, based upon plant, firm or farm data.

2. The procedures to be used are mostly microanalytic studies, based upon individual farm and production unit data.

3. None

4. As before, the Growth Center Discussion Papers will be circulated in the U.S. and to our LDC list, as well as AID's. The individual researchers will maintain their own individual ties with LDC personnel and institutions during the field work.

5. The projected firm budget for these activities follows.

SALARIES	
Professional	\$25,835
Research Assistants	15,250
Adm., Sec., Cler.	20,010
FRINGE BENEFITS	10,184
OVERHEAD	40,323
CONSULTANTS	4,800
TRAVEL & ALLOWANCES	7,880
PUBLICATIONS	2,300
SUPPLIES	9,250
DATA PROCESSING	4,500
DATA COLLECTION	<u>3,000</u>
	\$143,332

H. Appendix

DISCUSSION PAPERS

- 152 "Some Observations on the Economic Framework for Optimum LDC Utilization of Technology," August 1972 Gustav Ranis
- 160 "The Private Demand for Education in Relation to Labor Market Conditions in Less Developed Countries," October 1972 Gary Fields
- 163 "Unemployment as a Social Welfare Problem in Urban Zaire" November 1972 James McCabe
- 168 "Rural-Urban Migration, Urban Unemployment and Underemployment, and Job Search Activity in LDCs," December 1972. Gary Fields
- 170 "Tariff Policy, Equipment Production and Employment in Developing Countries," January 1973 James McCabe
- 178 "Urban Labor Surplus and the Commerce Sector: Colombia (and Appendix) June 1973 Albert Berry
- 179 "The Employment-Output Trade-off in LDCs: A Micro Economic Approach" June 1973 Howard Pack

OTHER PAPERS

- "A Model of Growth and Employment in the Open Dualistic Economy: The Cases of Korea and Taiwan," Sept. 1973 J.C.H. Fei and Gustav Ranis
- "Employment and Productivity in Kenyan Manufacturing" November 1972 Howard Pack
- "Labor in the Indian Agriculture Sector," November 1972 Robert Evenson
- "The Labor-and-Land Surplus Economy (Ghana)", October 1972 Richard Brecher
- "New Dimensions in National Accounting with Special Reference to Chile," January 1973 Markos Mamalakis
- "Services in the Contemporary Latin American City: The Case of Chile," September 1972 Markos Mamalakis
- "Income Redistribution in Chile Under Salvador Allende," August 1973 Markos Mamalakis
- "The Distribution of Labor Incomes in Urban Zaire," June 1973 James McCabe

OTHER PAPERS (Cont'd.)

"Factor Intensity of Consumption Patterns, Income Dis-
tribution and employment Growth in West Pakistan,"
November 1972

Ronald Soligo

"Some Evidence on Educational Relationships in Chile,"
November 1972

Marsha Goldfarb