Hiemenz, U.; Schatz, Klaus-Werner

Employment creation in less developed countries: A cross section analysis

Kiel Working Paper, No. 38

Provided in Cooperation with:
Kiel Institute for the World Economy – Leibniz Center for Research on Global Economic Challenges

Suggested Citation: Hiemenz, U.; Schatz, Klaus-Werner (1975) : Employment creation in less developed countries: A cross section analysis, Kiel Working Paper, No. 38, Kiel Institute of World Economics (IfW), Kiel

This Version is available at:
https://hdl.handle.net/10419/46777

Kieler Arbeitspapiere
Kiel Working Papers

Working Paper No. 38

EMPLOYMENT CREATION IN LESS DEVELOPED COUNTRIES -
A CROSS SECTION ANALYSIS

by

U. Hiemenz
K.-W. Schatz

Institut für Weltwirtschaft an der Universität Kiel

Kiel Institute of World Economics
Department IV
2300 Kiel, Düsternbrooker Weg 120

Working Paper No. 38

EMPLOYMENT CREATION IN LESS DEVELOPED COUNTRIES - A CROSS SECTION ANALYSIS

by

U. Hiemenz
K.-W. Schatz

December 1975

EMPLOYMENT CREATION IN LESS DEVELOPED COUNTRIES - A CROSS SECTION ANALYSIS

I. INTRODUCTION

1. Research in the field of economic development and respective discussions in the political sphere are presently focussing on two major issues: the social inequality within the third world and the continuously widening economic gap between developing (LDCs) and developed (DCs) nations. The remedy for both problems suggested by UNIDO, the UN General Assembly and various other institutions is a "new international economic order". One aspect of this new order is the claim for a 20 per cent share of LDCs in total manufacturing production of the world by the year 2000.[1] Given a 6.8 per cent share of LDCs manufacturing output at present (in 1973) a tremendous structural change will have to take place in third world economies and in the international division of labour in order to achieve the 20 per cent target. The purpose of this paper is to analyse the past structural change in LDCs and to outline some of the implications of the intended increase of their share in world industry. In particular, the paper seeks tentative answers to such questions as

- whether the necessary structural change is feasable and under which conditions it is likely to occur;

- what the prospective employment effects of such a strategy would be and

- whether alternative strategies might offer better chances in reducing unemployment and poverty within the third world.

---

[1] See UNIDO, Preliminary Note for the Preparation of a Plan of Action on Industrialization, Prepared by the UNIDO Secretariat, October 1974 (ID/B/C. 3/27).

To fulfill this task in the first part of the paper, a cross section analysis is applied to a sample of LDCs and DCs respectively. The focus is to identify major determinants of sectoral patterns of production, employment and productivity in both country groups and to find out whether there are differences among the various patterns or among country groups. Based on these estimates some projections of production and employment patterns are made in the final section of the paper and some consideration is given to the potential contribution to employment creation in various economic activities.

II. THE MODEL

2. Structural change in economic development can be attributed to demand factors as well as to supply factors. With income elasticities of demand different from one demand, patterns change with growing per capita income and provide unequal growth conditions for the various sectors of production. On the supply side, factor prices are changing in the course of economic development. Labour becomes scarce and more expensive in comparison to capital thus reducing growth perspectives of industries producing labour-intensive goods. In addition, in an open economy, structural changes are induced by changes in comparative advantages. Therefore, per capita income was chosen as the main explanatory variable for patterns of sectoral growth and employment.

3. Since both empirical experience and economic theory suggest that there are a number of determinants of structural patterns in addition to per capita income a multiple regression approach was employed to explain the observed variations in the patterns. These additional determinants may be classified into two categories. The first consists of natural characteristics of countries. Among these are the country size, the resource endowment and location

parameters. The second group is comprised of institutional and policy influences on economic activities such as the industrialization and foreign trade policy pursued by the government, the education system and the social legislation. Both kinds of determinants, but especially those of the second group, are in general difficult to specify as explanatory variables. In this paper the classical variables "population size" and "territorial size" were applied together with the population density (population per km^2) to explain influences on the observed pattern which might be due to size characteristics of the countries. Concerning the policy influences, we resorted to two performances indicators: The foreign trade share in GDP and the share of total employment in total population (participation rate). Both were tried, but the foreign trade ratio was finally deleated because of strong correlation with the population size variable (the smaller the population the higher the foreign trade ratio).[1]

4. According to these considerations the following functional relationships were specified:

$$(1) \qquad Y_i^j = f\,(X_1^j,\ X_2^j,\ X_3^j,\ X_4^j,\ X_5^j)$$

where

Y_i^j = ratio of value added in sector i to total population of country j

X_1^j = per capita income in country j

X_2^j = ratio of employed persons to total population in j

X_3^j = territorial size of j in km^2

X_4^j = total population of j

X_5^j = population density in j

---

[1] The coefficient of determination between population size and foreign trade ratio, which was estimated on the basis of 61 countries and a double-logarithmic function, amounted to 0.51.

$$(2) \qquad Z_i^j = f\,(X_1^j,\ X_2^j,\ X_3^j,\ X_4^j,\ X_5^j)$$

where

Z_i^j = sectoral employment in country j measured as persons employed per thousand inhabitants

$$(3) \qquad P_i^j = f\,(Y_1^j,\ X_2^j,\ X_3^j,\ X_4^j,\ X_5^j)$$

where

P_i^j = sectoral value added per person employed in sector i of country j

These functions were estimated in their double-logarithmic form.

5. Besides from using more up-to-date data our model differs from previous cross country studies[1] in providing comparable projections of both employment and production patterns. The main differences with previous studies are:

---

[1] H.B. Chenery, Patterns of Industrial Growth. The American Economic Review, Vol. 50 (1960), pp. 624 sqq. - United Nations, A Study of Industrial Growth. New York, 1963. - W. Galenson, Economic Development and the Sectoral Expansion of Employment. International Labour Review, Vol. 87 (1963), pp. 505 sqq. - H.B. Chenery and L. Taylor, Development Patterns - Among Countries and over Time. The Review of Economics and Statistics, Vol. 50 (1968), pp. 391 sqq. - R. Blandy and J. Maton, The Sectoral Distribution of Employment and the Level of Economic Development. Tijdschrift voor Sociale Wetenschappen. Gent, Vol. 14 (1969, No. 4). pp. 16 sqq. - G. Fels, K.W. Schatz and F. Wolter, Sektoraler Strukturwandel im weltwirtschaftlichen Wachstumsprozeß. Die Weltwirtschaft. Tübingen, 1970, H. 1, pp. 49 sqq. - G. Fels, K.W. Schatz and F. Wolter, Der Zusammenhang zwischen Produktionsstruktur und Entwicklungsniveau. Weltwirtschaftliches Archiv, Vol. 106 (1971/I), pp. 240 sqq. - Y. Sabolo, Sectoral Employment Growth: The Outlook for 1980, in: W. Galenson (ed.), Essays on Employment, ILO, Genf, 1971, pp. 41 sqq. - H.Chenery and M. Syrquin, Patterns of Development, Oxford University Press, London, 1975.

a) Patterns of both production and employment are investigated on the basis of the same country samples and the same years of reference. In addition, the same explanatory variables and the same specification of functional relationships are employed in estimating both patterns.

b) Production and employment data and regression results are combined in order to examine patterns of productivity; production in individual sectors - and hence productivity - is measured in constant prices as is usual, but in current, sector specific prices which are deflated by the overall rate of inflation. Productivity measured here therefore reveals the relative income generated per person employed in the different sectors.

c) Regression estimates are carried out for developing and for developed countries separately as well as in combination. This allows one to determine whether the same patterns are characteristic for both country groups and whether they can be attributed to the same explanatory variables. Additional estimates are made to test the statistical significance of observed differences between the two country samples. Since the focus of this paper is on in the analysis of structural patterns for developing countries, the estimates for developed countries serve mainly as control experiments.

III. METHODICAL COMPLICATIONS

6. In some previous studies of production patterns, the dependent variable was specified as share of sectoral production in total production (y_i^j) being a function of per capita income (X_i^j):

$$y_i^j = g\ (X_1^j)$$

The transformation in the dependent variable does not alter the standard error of the regression, but the variance in the dependent variable will be changed. Since the coefficient of determination is a negative function of the standard error divided by the variance, the statistical significance of the alternative concepts differs, although both lead to the same regression results.[1]

7. Whether the value added or the percentage share approach yields statistically more "significant" results depends on the income elasticity of Y_i^j with respect to X_1^j. The closer the income elasticity to one, the lower will be the coefficient of determination in the percentage share approach (y_i^j) and the more pronounced will be the improvements in R^2 that can be attained by switching to the value added approach. In the extreme case of a perfect one-one-relation between per capita income and structural change and with an income elasticity of one, the former concept will show $R^2 = 0$ (the per percentage share in GDP remains constant) while the latter will show an $R^2 = 1$. Conversely, the share concept will lead to statistically more significant results when the income elasticity is close to zero (sectoral value added per capita remains constant). Since on economic grounds both approaches can be justified, we have tested both for production patterns. For reasons of comparability the percentage share of sectoral employment in total employment was used alternatively to Z_i^j although in the case of employment the percentage share is no linear transformation of sectoral employment per 1000 inhabitants (Z_i^j).

8. However, it should be stressed that one cannot judge the relative performance of different regression estimates merely from the size of a calculated R^2. Lower R^2's do not necessarily indicate weaker development patterns than higher R^2's - neither when comparing different specifications of the regression equation or of the

---

[1] For a discussion of related problems in regression analysis see P. Rao and R.L. Miller, Applied Econometrics. Belmont, Cal., pp. 15 sqq.

variables for the same sector nor when comparing the same specifications for different sectors. The same caution is appropriate if one confronts patterns of production to patterns of employment or productivity: whether the R^2 is high or low depends to an important part on the elasticities of the dependent with respect to the independent variables, and, therefore, on the specification of the variables under investigation and on the applied functional form of the regression equation. To allow for a better interpretation of the performance of the regression estimates one can take into consideration the error of the regression (Sy.x.). We have standardised this value by expressing it as a percentage of the mean of the dependent variable. Those results are also presented in the respective tables.

IV. DATA

9. Comparing production with employment structures within an international cross-section analysis involves some data problems. Since employment statistics are less comprehensive and less updated than production statistics, the former were a limiting factor in applying the model. Production statistics provided by the "industrial origin concept" of the UN National Accounts Statistics were aggregated up to eight sectors of production to match the employment concept provided by the ILO Labour Statistics. Some countries could not be included in the sample because either production or employmnet figures or both were not disaggregated sufficiently to fit into our aggregation scheme. Nevertheless, the degree of disaggregation is even higher than has been the case in most previous studies which concentrated either on production or on employment. To obtain consistent data for production as well as for employment the same year for both sets of data was chosen. Since employment figures are available only for census years, which differ internationally, data for the different countries

in the sample do not necessarily refer to the same year. Only a limited number of developing countries publishes employment figures at all. This together with a lack of production data in some cases constrained the sample to forty developing countries. Statistical shortcomings with respect to the level of aggregation limited the number of developed countries to 15. The countries included in the samples are listed in table 22* in the Appendix.

10. The main explanatory variable per capita income was measured in constant 1963 US-Dollars as published in UN National Accounts Statistics and in UN Statistical Yearbook. The additional explanatory variables were obtained from the same sources except for population and employment figures which were provided by ILO Yearbooks of Labour Statistics. Instead of total labour force the total number of employed persons was used for the specification of sectoral percentage shares of employment and the participation rates to avoid statistical unreliabilities in unemployment figures.

V. RESULTS

11. To allow for a comparison of our results with previous studies and to trace the influence of additional explanatory variables two sets of regressions were estimated separately. In the first set only per capita income as proxy for economic development was employed as independent variable while all 5 variables were used in the second set of estimates applying a stepwise multiple regression approach. The results are presented in the appendix in tables 1* - 8* and tables 9* - 20* respectively.

12. Concerning the simple regression between level of economic development and structural changes two major findings emerge from our estimates (tables 1* - 6*). First, there seems to be a closer

relation between per capita income and changes in production structures than between per capita income and changes in employment structures. Secondly, according to both approaches (sectoral employment per thousand inhabitants and sectoral percentage share in total employment) employment patterns appear to be less closely connected to the level of development as was suggested by previous studies based on combined samples.[1] In the case of DCs R^2's of employment estimates even proved to be statistically insignificant for most sectors[2] implying that per capita income is no major determining variable for employment changes. The standard errors of regression show, however, that unexplained residuals are approximately in the same range for both patterns and for both country groups thus revealing smaller variations in the explanatory power among the respective estimates as indicated by the R^2's.

13. The individual income and employment elasticities were of the expected sign and size. A characteristic divergence between the patterns for LDCs and for DCs is that in LDCs, with growing per capita income, the secondary as well the tertiary sector of the economy, can expand their shares in GDP as well as in employment at the expense of the agricultural sector, while in DCs there is a pronounced shift in relative importance to the

---

[1] Cf. Blandy and Maton, op.cit., and Sabolo, op.cit.

[2] The term significant is used in this paper when the computed t-values satisfy the 90% criteria. t-values are:

	level of significance 90%	95%
Developed Countries (n=15)	1.75	2.13
Developing Countries (n=40)	1.68	2.02
Developing and Developed Countries (n=55)	1.67	2.01

The tables also show R^2's and, underneath in brackets, R^2's adjusted for degrees of freedom.

service sector. In developing countries the income elasticity of productions is the highest for manufacturing (with the exception of energy), in developed countries it is the highest for services, which appears in fact to be twice as high as for manufacturing. The employment estimates mirror the changes of production structure. The service sector in the case of DCs and the manufacturing sector in the case of LDCs reveal the highest growth rates of employment. On the other hand, manufacturing employment is declining in DCs and employment in the service sector of LDCs shows an only medium rank rate of increase. These findings support the notion that industrialized countries shift from hardware to software economies due to rising internal and external demand for services and the growing importance of developing countries as suppliers of manufactured products.

14. In two cases, mining and energy, the model failed in terms of "explaining" production or employment patterns. High standard errors and low R^2's, which were obtained for mining, are perhaps due to the fact that mining depends less on the level of economic development than on a country's endowment of natural resources. In energy, high unexplained residuals, expecially in the case of LDCs, cast severe doubts on the reliability of the respective estimates although the regression coefficients were statistically significant and of the expected positive sign.

15. The most interesting result with respect to production patterns, which emerged from the introduction of additional explanatory variables, is the fact that all variables which have proved to

be of importance for the structure of production in LDCs do not play a role for patterns in DCs (tables 9* - 10*):[1]

- Concerning LDCs it is not surprising that the additional variables contribute little to the explanation of the production pattern since simple regressions between sectoral value added per capita and per capita income yielded high coefficients of determination in almost all sectors. With respect to the different variables and their significance the main results are that, according to ß weights[2], the size of the population had a small positive impact on the production of manufactures and that the share of

---

[1] To economize on space only in the case of agriculture both the per capita value added and the percentage share estimates are given in the respective tables. For all other sectors results based on the percentage share approach do not provide more information than the results shown in the tables 9* - 10*. The presentation of the double logarithmical functions follows the form of the step-wise regression analysis: per capita income was forced in first and only those variables which proved to be statistically significantly according to t-values were added. If no coefficient besides the one for per capita income turned out to be significant the coefficient with the relatively highest t-value is shown in order to illustrate the influence the respective additional variable on the coefficient for per capita income and its t-value.

[2] The beta-weight is defined by

$$\frac{S_{X_i}}{S_Y} \cdot \hat{ß}_i ,$$

where S_{X_i} - standard deviation in the independent variable X_i; S_Y - standard deviation in the dependent variable Y; $\hat{ß}_i$ - estimated coefficient for the independent variable X_i. The beta-weights can be taken as a measure for the relative contribution of the various independent variables in the regression to the changes of the dependent variable.

employed persons in total population affected agricultural production to a considerable extent, a phenomenon, which will be discussed later on in greater detail. The importance of the population variable for manufacturing production may be explained by interpreting this variable as a proxy for the size of internal markets. In the early phase of industrialization, when domestic suppliers are not yet competitive in international markets, internal markets can be a limiting factor to production. Larger markets encourage production because they allow for economies of scale and reduce entrepreneurial risks through a larger potential demand.

- Concerning the sample of industrialized countries the regression estimates were improved tremendously by the additional explanatory variables, except in the cases of the commercial and service sectors, in which expansion - as also indicated by the ß weights - seems to be mainly related to the level of development. Despite of the better fit of the function, however, the various coefficients seem to reflect special characteristics of the countries in our sample rather than systematic economic relationships. Since our sample is admittedly small, a few extreme countries can predominate the estimates, while the bulk of countries does not differ much from one another with respect to the ovserved relations. This is especially true for the population and country size variables. Some small countries like Denmark, Sweden, Norway, Finland and Switzerland show relatively high shares of agriculture, construction and transport in total GDP mainly because of peculiarities of their geographical location. Similarly, mining activities are concentrated in large countries like USA and Canada which might explain the positive sign for country size in the case of mining. Contrary to LDCs, for manufacturing production in DCs the size of internal markets as measured by the population size seems to be without importance since these countries are integrated into the international division of labour to a substantial degree and can insofar substitute the world market for small domestic markets.

16. The multiple regression estimates of employment patterns (tables 12* - 17*) support the above hypothesis (para 11) that, contrary to production patterns, the structure of employment in DCs is rather determined by special characteristics of the countries than by economic growth whereas per capita income did play a role in explaining employment shares in LDCs. Again, the significance of the additional variables is varying among the two samples thus suggesting that the determinants of employment structures in DCs and LDCs are different.

17. In the case of LDCs the participation rate and the size of the population appear most frequently in the regression function, both having a positive impact on the number of people employed in various sectors. The interpretation of the participation rate as a determinant of employment calls for some cautions since the observed variations in the participation rate might simply reflect statistical shortcomings of the basic data which result in a systematical bias. Notorious conceptual and technical deficiencies of employment data in LDCs lend some support to this hypothesis. One could argue that employment figures of those sectors are most unreliable in which high shares of non-market activities, heavy seasonal fluctuations and family work are prevalent. Agriculture and Commerce are the first in line to be mentioned in this context. A refined counting of the otherwise neglected employed persons would result in both a higher participation rate and higher employment figures in specific sectors. Since there is no statistical evidence available to prove the validity of this proposition the interpretation of the respective estimates has to be based on educated reasoning.

18. At the first glance the regression results seem to support the statistical bias hypothesis. Higher participation rates go along with larger shares of agricultural employment in total employment and declining shares of almost all other sectors (table 15*). The estimated increases in the absolute number of jobs provided in

manufacturing and construction (table 12*) could stem from an elaborated counting of small scale activities, handicraft and rural construction activities. On the other hand, there is some evidence which can hardly be explained in terms of statistical errors:

- The regression estimates of the developed countries (table 13*), which are based on relatively reliable labour statistics also reveal statistical significant estimates for the participation rate in four sectors. In DCs high participation rate are associated with high employment figures in the leading growth sectors (manufacturing and services) and in the related distribution sectors (commerce and transport).

- In LDCs the number of jobs provided in "energy" declines when the share of employment in total population increases (table 12*) suggesting an adverse effect of employment on the demand for the provision of public utilities.[1]

- In the case agricultural production in LDCs the participation rate also emerged as a statistically significant explanatory variable (table 9*) indicating a positive relationship between overall employment and the size of agricultural output.[2]

---

[1] This tentative explanation is supported by a negative sign of the respective coefficient for the participation rate in production estimates (table 9*); however, this relationship did not prove to be statistically significant.

[2] Of course, this result could also reflect a merely statistical phenomenon if production and labour statistics improve jointly. But this is not very likely to happen because the improvements in the collection of production data which certainly took place were hardly incisive enough to produce a significant systematic bias.

- Finally, given the shortcomings in LDCs labour statistics it is reasonable to assume that the reliability of statistics improves with economic development. Thus we would expect the participation rate increase with increasing per capita income, ceteris paribus. However, a significant correlation between per capita income and participation rates was not observed.

19. Summarizing, one may conclude that although the statistical bias hypothesis cannot be ruled out completely a cautious economic interpretation of the regression estimates is justified. The regression functions suggest two things concerning the creation of employment: first, countries which maintained a higher share of agricultural production in total production were more successful in providing jobs than those countries with a rapidly declining agricultural sector, and secondly, a higher share of employment was observed in countries in which rather labour-intensive than capital-intensive technologies were applied throughout the development process. This is most clearly reflected in table 18* which shows the regression estimates for labour productivity as dependent variable. The negative sign of the participation rate indicates that more employment was produced by lower labour productivities in agriculture, manufacturing and construction. These findings provide some evidence for distinct structural differences between countries with a successful employment record and countries with continuously high unemployment rates.

20. Concerning the other independent variables the negative influences of the territorial size on the employment share of manufacturing may be noted (table 12*). Since the production pattern is not related to this variable the impact on sectoral employment must result from differences in the applied technology or differences in the composition of the product. An explanation for this phenomenon is provided by the obervation that small countries which, in general, are poorly endowed with natural resources rather had to encourage

export-oriented industrialization to close the balance of payments deficit emerging from imports of food and of other basic needs than to persue inward looking strategies as larger countries did in most cases. Therefore, it is reasonable to assume ... that small countries are specialized in the production of those goods which proved to be highly competitive in international markets, i.e., in labour-intensive goods. In large countries, on the other hand, the local production of capital-intensive goods was promoted by import substitution policies while export activities were neglected. Accordingly, the average labour intensity in manufacturing is higher in small countries which is also reflected in the coefficients estimated for labour productivity (table 18*).

21. The results reported so far have revealed differences in the underlying functional relationships for the two country samples. To provide some information on whether a true picture of structural changes in LDCs can be drawn based upon a combined sample of DCs and LDCs some tentative estimates were carried out as to the statistical significance of the observed differences. A dummy variable D was introduced into the simple regression functions[1]:

$$\left.\begin{matrix} \ln Y_i^j \\ \ln Z_i^j \\ \ln P_i^j \end{matrix}\right\} = \alpha + \beta_1 \ln X_1^j + \beta_2 D + \beta_3 D \ln X_1^j \quad [2]$$

with

$$D = \begin{cases} 0 \text{ for developed countries} \\ 1 \text{ for developing countries} \end{cases}$$

---

[1] For this method see A.S. Goldberger, Econometric Theory, New York, London, 1964, pp. 227 sqq.

[2] All dependent variables (and per capita) are specified as before, i.e. the newly obtained regression results are comparable to the former ones.

22. Two conclusions emerge from the respective estimates presented in table 21*. First, regression estimates for the combined sample of developing and developed countries in general provide fairly reliable elasticities with respect to per capita income for both country groups, since significant differences in the slope of the functions (dummy II) were observed only in few sectors. These however important exceptions are manufacturing and energy in the case of production patterns, and construction in the case of employment patterns. Secondly, separate estimates for each country group should be prefered especially in the case of employment patterns if the focus of the analysis is on sectoral shares rather than on percentage changes, since dummy I indicates significant differences in the intercept of the functions for half of the observed sectors. In the light of these tests projections of employment patterns for developing countries which have been carried out on the basis of regressions for mixed LDC/DC samples[1] should be regarded with caution.

23. The observed structural differences between the two samples could cast some doubts on the familiar proposition that LDCs follow "cum grano salis" the development path of DCs. It should be kept in mind, however, that cross-country estimates merely reflect the past average experience of the analysed countries and do not provide evidence of, in any sense, optimal structural patterns. Since the bulk of LDCs pursued excessively inward-oriented industrialization strategies to enhance GDP-growth and neglected other economic activities as well as other macroeconomic aims, the observed structure of production and employment is distorted as compared to a situation for instance when development policies were focussing on comparative advantages in the production of goods

---

[1] See for example Sabolo, op.cit., pp. 49 sqq.

and services. Therefore our estimates cannot be used to falsify the above hypothesis which is based on the assumptions that internal factor prices in LDCs are not artificially distorted by policy means and that efforts are undertaken to become integrated into the international division of labour.

VI. SOME IMPLICATIONS OF THE UNIDO PROPOSITION AND SOME TENTATIVE CONCLUSIONS

24. The principal findings of our cross-country exercise may be summarized in the following way. Common patterns of structural change of production and employment were found among LDCs as well as for the sample of DCs. The variation of sectoral employment and production shares proved to be wider among LDCs than in the mixed samples which were employed in previous studies. The causes of these variations are to be traced to differences in the natural endowment of developing countries and to differences in the applied development policies. Concerning growth and employment perspectives of LDCs, the role of manufacturing as the most dynamic sector was emphasized by a high income elasticity of production; however, employment opportunities in manufacturing remain scarce as compared to the agricultural sector, which plays a dominant role in this field up to a rather high level of economic development.

25. Fitting the UNIDO assumptions concerning GDP-growth in LDCs (7.5 and 5.6 per cent per annum), and in DCs (5.6 and 3.3 per cent per annum), and concerning population growth (2.3 per cent per annum for LDCs and .8 per cent per annum in DCs) into the functions given in tables 1* - 3*, even a 25 per cent share of LDCs in world manufacturing production as advocated by the Lima Conference in March 1975[1] seems to be fairly realistic.[2] But, in addition to the

---

[1] UNIDO, Second General Conference of UNIDO, Lima, Peru, 12-16 March, 1975, ID/Conf. 3/31, 9.5.1975.

[2] Our estimates cover the period 1972-2000 and were based on 1972 per capita incomes in 1970 US $ (Source: UN, National Accounts Statistics, Vol. III, 1973).

well-founded methodological criticism on such long-range projections, doubts can be cast on these results with repect to the underlying growth assumptions. Quite a number of people[1] consider the UNIDO rates to be rather on the optimistic side since the consequences of the oil crisis, the world-wide recession and obstacles against the necessary rapid structural adaptation in DCs could result in a slackening of growth rates in DCs as well as in LDCs. In fact, even trend figures of the period 1960-72 are considerably below the UNIDO assumptions for LDCs (2.7 per cent per annum per capita income growth as compared to 5.1 and 3.2). Separate estimates based on an extrapolation of trends and on a more pessimistic assumption of 4 per cent GDP growth in both country groups lead to the conclusion that LDCs could at most achieve a 15 per cent share in world manufacturing production as compared to roughly 7 per cent today.

26. To discuss the pros and cons of either assumption is not the focus of this paper. We would rather like to shed some light on the implications of an enhanced industrial growth on the labour market situation in the Third World. When supplementing the above production estimates with employment estimates applying the functions given in table 4* the following results are obtained. As compared to 1972 an additional 30 (16) jobs per 1000 inhabitants will be created in manufacturing by the year 2000 under optimistic (pessimistic) UNIDO assumptions. But, in the same period 100 (73) people per 1000 inhabitants will loose their jobs in agriculture producing a net reduction of employment in manufacturing and agriculture of 71 (57) jobs per 1000 inhabitants. This means, translated into relative terms, that annually .8 (.7) per cent of the total labour force will

---

[1] See for instance, J.B. Donges, Industrialisierungsziele - Einige kritische Bemerkungen zur Industrialisierungsprojektion der UNIDO, in: Internationale Entwicklung (Zeitschrift der österreichischen Forschungsstiftung für Entwicklungshilfe), Vienna, 1975/I, pp. 17 sqq.; H.H. Glismann, P. Juhl, B. Stecher, Implikationen der "Neuen Weltwirtschaftsordnung", Report submitted to the German Ministry of Economics, Kiel, November 1975, pp. 9 sqq.

be set free (assuming an average participation rate of 35 per cent[1]) and will have to be accommodated in economic activities other than agriculture or manufacturing. This figure has to be evaluated together with the projected 2.3 - 2.5 per cent per annum increase of the total labour force in LDCs which creates a high additional demand for jobs, which will not be provided in either manufacturing or agriculture according to our estimates.

27. An explanation for these unfavourable results is provided in table 1, which shows how much of sectoral value-added growth can be attributed to increases of employment and to a rise of labour productivity. In the case of LDCs, sectoral growth of production was accompanied by positive increments to employment in all sectors but agriculture while in most sectors labour productivity increased faster than employment. Agriculture proves to be an outstanding case since labour productivity was augmented in this activity at a pace which even exceeded value-added growth. The result was a considerable absolute decline of agricultural employment although agricultural production expanded with growing per capita income. Reasons for this development are not found easily and are likely to vary substantially among countries. One common phenomenon of most LDCs is certainly the internal rural-urban migration which causes a decline of labour supply in rural areas. Possible reactions are a more intensive usage of remaining labour or capital deepening, both resulting in increasing labour productivities. Further reasons might be seen in improved fertilizer inputs and in changes of the internal structure of agricultural production (large, export-oriented plants have been expanding at a faster pace than the small family farms or a process of farm concentration took place in the past). In any case, definite answers will require more comparative research.

---

[1] A computation of total employment effects based on the estimated functions was not feasible since the separate sectoral estimates cannot be aggregated to totals.

Table 1 - Composition of Sectoral Value-Added Growth in Developing and Developed Countries (p.c.)

Sector	Percentage Contributions[a] to Sectoral Value-Added Growth			
	Developing Countries		Developed Countries	
	Labour	Labour Productivity	Labour	Labour Productivity
Agriculture	-146.9	246.9	-284.4	384.4
Mining	24.5	75.5	11.0	89.0
Manufacturing	37.1	62.9	- 23.6	123.6
Construction	53.3	46.7	-131.4	231.4
Energy	41.6	58.4	99.0	1.0
Commerce	30.2	69.8	32.6	67.4
Transport	44.7	55.3	- 3.6	103.6
Services	35.6	64.4	34.5	65.5

[a] Calculated as percentage shares of employment or productivity elasticities in the corresponding per capita value-added elasticities.

Source: Tables 1*, 2*, 4*, 5*, 7*, 8*.

28. Admittedly, our employment projections are rather crude since they hypothesize a continuity of past trends. However, it may be safe to conclude that economic policies which are solely geared towards industrial expansion in LDCs are very likely to cause severe damage to the labour markets. Given the fact that up to now most developing countries proved to be unable to cope with their fast growing labour force a further net reduction of employment opportunities in the two most important economic sectors will presumably lead to drastically expanding unemployment rates in a large number of countries, which easily could reduce the chances for any kind of economic development. On these grounds, the value of the UNIDO proposition becomes questionable, too.

29. Concerning a reorientation of development policies, two guidelines may be deducted from our cross-country experiment: first, not only the growth rate of industrial production but also the rate of expansion of industrial employment does matter, and secondly, the rate of decline of agricultural employment has to be slowed down, since even drastic increases of industrial outputs will not be sufficient to absorb enough job seekers in an appropriate period of time given the small share of manufacturing industry in GDP and in total employment. The dimension of these suggestions are illustrated in table 2, which shows the marginal contributions to sectoral employment of an incremental change in sectoral output at different levels of per capita income, holding the respective average labour productivity constant. These figures demonstrate that - especially at lower levels of economic development - a large reservoir of employment opportunities exists in the agricultural sector provided development policies successfully give incentives to those activities and those technologies which make use of abundant labour rather than of scarce capital. A similar consideration holds true for the manufacturing sector although its marginal contribution to employment only accounts for

Table 2 - Number of Jobs per 1000 inhabitants created in different Sectors of Production by expanding Output by 1000 US-Dollars respectively[a]

(Different levels of per capita income)

	Per capita income (US-Dollars)							
	100	150	200	300	400	500	700	1000
Agriculture	5.91	3.96	2.99	2.01	1.51	1.21	0.87	0.61
Mining	1.18	0.83	0.65	0.46	0.36	0.30	0.22	0.16
Manufacturing	1.97	1.38	1.07	0.75	0.58	0.48	0.36	0.26
Construction	1.58	1.23	1.03	0.80	0.67	0.58	0.47	0.38
Energy	1.49	0.94	0.68	0.43	0.31	0.24	0.16	0.11
Commerce	1.31	0.96	0.77	0.57	0.45	0.38	0.30	0.22
Transport	1.17	0.92	0.78	0.61	0.51	0.45	0.37	0.30
Services	1.67	1.22	0.98	0.71	0.57	0.48	0.37	0.28

[a] Assuming a constant labour productivity at each level of per capita income

Source: Table 7*.

about one third of the number of jobs potentially created in agriculture. Furthermore, table 2 shows that the creation of new jobs demands higher sectoral growth rates of output, the higher the level of per capita income, i.e., if a country does not seriously tackle her unemployment problems in the early stages of development the amount of resources required to do so in later stages is augmenting exponentially.

30. To sum up, an argument can be made for devoting more resources to the promotion of agricultural development and less resources to an accelerated growth of industrial output. Such "balanced growth" policies seem to offer a better chance to defeat mass poverty in LDCs than the merely industry-oriented attempts which were tried out in the past. We believe, however, that a great deal of research concerning rural development and linkages between growth poles and backward areas is still needed to outline the envisaged growth and employment oriented strategies in greater detail.

Appendix

Table 1*

Per Capita Income and Structural Change in 40 Developing Countries: Production

Independent Variable: Per Capita Income

Sector		Dependent Variable							
		Sectoral Per Capita Value Added				Sectoral Percentage Share in GDP			
		Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$	Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$
Agriculture	Coefficient	2.0107	0.3974	0.323	8.65	6.6159	- 0.6026	0.524	11.37
	t-Value	3.8137	4.2624	(0.306)		12.5483	- 6.4635	(0.511)	
Mining	Coefficient	- 4.8744	1.1278	0.152	116.31	- 0.2692	0.1278	0.002	379.26
	t-Value	- 1.9912	2.6054	(0.129)		- 0.1100	0.2953	(-0.024)	
Manufacturing	Coefficient	- 4.1163	1.3884	0.820	11.26	0.4888	0.3884	0.263	15.54
	t-Value	- 6.8989	13.1591	(0.815)		0.8193	3.6812	(0.243)	
Construction	Coefficient	- 4.8925	1.3139	0.806	16.49	- 0.2874	0.3139	0.192	27.82
	t-Value	- 8.2861	12.5844	(0.801)		- 0.4867	3.0068	(0.171)	
Energy	Coefficient	- 9.8488	1.9374	0.808	57.86	- 5.2436	0.9374	0.497	2367.53
	t-Value	- 11.3795	12.6592	(0.803)		- 6.0586	6.1252	(0.484)	
Commerce	Coefficient	- 2.4121	1.0888	0.834	8.36	2.1930	0.0888	0.032	11.51
	t-Value	- 5.4183	13.8315	(0.830)		4.9261	1.1286	(0.007)	
Transport	Coefficient	- 3.2347	1.0661	0.738	14.72	1.3705	0.0611	0.011	23.30
	t-Value	- 5.5461	10.3371	(0.731)		2.3498	0.6410	(-0.015)	
Services	Coefficient	- 2.6989	1.2023	0.862	7.56	1.9063	0.2024	0.150	10.09
	t-Value	- 6.1183	15.4142	(0.858)		4.3215	2.5941	(0.128)	

Table 2 *

Per Capita Income and Structural Change in 15 Developed Countries: Production

Independent Variable: Per Capita Income

Sector		Dependent Variable							
		Sectoral Per Capita Value Added				Sectoral Percentage Share in GDP			
		Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$	Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$
Agriculture	Coefficient	2.3442	0.3123	0.053	8.67	6.9494	- 0.6877	0.214	24.42
	t-Value	0.8370	0.8549	(-0.020)		2.4812	- 1.8823	(0.154)	
Mining	Coefficient	- 7.2447	1.3554	0.193	27.52	- 2.6396	0.3554	0.016	1034.09
	t-Value	- 1.2294	1.7635	(0.131)		- 0.4479	0.4624	(-0.059)	
Manufacturing	Coefficient	0.8979	0.7278	0.709	2.25	5.5030	- 0.2722	0.254	4.25
	t-Value	0.9054	5.6266	(0.687)		5.5490	- 2.1042	(0.197)	
Construction	Coefficient	- 0.8650	0.7783	0.567	4.16	3.7402	- 0.2217	0.096	10.39
	t-Value	- 0.5976	4.1224	(0.533)		2.5839	- 1.1741	(0.026)	
Energy	Coefficient	- 2.7119	0.8761	0.549	6.18	1.8933	- 0.1239	0.024	26.21
	t-Value	- 1.6070	3.9801	(0.515)		1.1219	- 0.5630	(-0.051)	
Commerce	Coefficient	- 1.0737	0.8817	0.624	3.75	3.5315	- 0.1183	0.029	8.12
	t-Value	- 0.7385	4.6492	(0.596)		2.4290	- 0.6239	(-0.046)	
Transport	Coefficient	- 2.7481	1.0178	0.551	5.67	1.8570	0.0178	0.00038	14.37
	t-Value	- 1.4066	3.9940	(0.516)		0.9505	0.0700	(-0.077)	
Services	Coefficient	- 4.4172	1.4138	0.837	3.03	0.1879	0.4138	0.305	5.80
	t-Value	- 3.3270	8.1636	(0.824)		0.1416	2.3892	(0.252)	

Table 3*

Per Capita Income and Structural Change in 40 Developing and in 15 Developed Countries: Production

Independent Variable: Per Capita Income

Sector		Dependent Variable							
		Sectoral Per Capita Value Added				Sectoral Percentage Share in GDP			
		Constant	Per Capita Income	R^2	$Sy^*x/\bar{y}\cdot 100$	Constant	Per Capita Income	R^2	$Sy\cdot x/\bar{y}\cdot 100$
Agriculture	Coefficient	2.6382	0.2818	0.394	8.64	7.2434	- 0.7182	0.809	13.48
	t-Value	8.7695	5.8705	(0.383)		24.0770	-14.9645	(0.805)	
Mining	Coefficient	- 3.6882	0.9081	0.297	78.75	0.9169	- 0.0919	0.004	432.96
	t-Value	- 3.0661	4.7321	(0.284)		0.7623	- 0.4786	(-0.014)	
Manufacturing	Coefficient	- 3.9431	1.3583	0.940	8.37	0.6621	0.3583	0.521	12.95
	t-Value	-13.3226	28.7660	(0.939)		2.2370	7.5879	(0.512)	
Construction	Coefficient	- 4.6781	1.2759	0.932	11.61	- 0.0730	0.2759	0.392	22.81
	t-Value	-15.8152	27.0362	(0.931)		- 0.2466	5.8459	(0.381)	
Energy	Coefficient	- 7.7877	1.5599	0.894	31.48	- 3.1825	0.5599	0.521	210.82
	t-Value	-16.8425	21.1456	(0.892)		- 6.8828	7.5895	(0.512)	
Commerce	Coefficient	- 1.9040	0.9956	0.933	6.81	2.7011	- 0.0044	0.00027	10.81
	t-Value	- 8.2873	27.1622	(0.932)		11.7567	- 0.1196	(-0.019)	
Transport	Coefficient	- 3.4549	1.1069	0.912	11.03	1.1503	0.1069	0.088	20.60
	t-Value	-11.6496	23.3953	(0.910)		3.8788	2.2596	(0.071)	
Services	Coefficient	- 2.5342	1.1713	0.953	5.97	2.0710	0.1713	0.304	8.97
	t-Value	-11.3552	32.8983	(0.952)		9.2798	4.8120	(0.291)	

Table 4*

Per Capita Income and Structural Change in 40 Developing Countries: Employment

Independent Variable: Per Capita Income

Sector		Dependent Variable							
		Persons employed per 1000 inhabitants				Sectoral Perdentage share in total employment			
		Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$	Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$
Agriculture	Coefficient	8.3060	- 0.5836	0.397	9.14	6.5632	- 0.4778	0.506	7.78
	t-Value	12.5836	- 4.9999	(0.381)		15.1395	- 6.2329	(0.493)	
Mining	Coefficient	- 0.7834	0.2765	0.019	164.39	- 2.5262	0.3822	0.036	-336.27
	t-Value	- 0.4305	0.8592	(-0.007)		- 1.3840	1.1842	(0.010)	
Manufacuting	Coefficient	0.5882	0.5148	0.218	17.89	- 1.1546	0.6206	0.299	26.02
	t-Value	0.6574	3.2536	(0.197)		- 1.3237	4.0232	(0.280)	
Construction	Coefficient	- 1.6043	0.7000	0.193	39.16	- 3.3471	0.8058	0.270	71.66
	t-Value	- 1.2237	3.0194	(0.172)		- 2.7507	3.7448	(0.250)	
Energy	Coefficient	- 4.2365	0.8065	0.263	290.09	- 5.9793	0.9123	0.264	-114.34
	t-Value	- 3.4244	3.6867	(0.244)		- 4.2749	3.6886	(0.244)	
Commerce	Coefficient	1.3627	0.3289	0.172	14.37	- 0.3801	0.4347	0.263	22.52
	t-Value	2.0548	2.8047	(0.150)		- 0.5695	3.6832	(0.244)	
Transport	Coefficient	- 0.3600	0.4769	0.327	18.84	- 2.1026	0.5827	0.386	40.02
	t-Value	- 0.5726	4.2926	(0.309)		- 3.1183	4.8871	(0.370)	
Services	Coefficient	1.3824	0.4286	0.376	9.30	- 0.3604	0.5343	0.344	17.83
	t-Value	2.7292	4.7847	(0.360)		- 0.5323	4.4633	(0.327)	

Table 5* Per Capita Income and Structural Change in 15 Developed Countries: Employment

Independent Variable: Per Capita Income

Sector		Dependent Variable							
		Persons employed per 1000 inhabitants				Sectoral percentage share in total employment			
		Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$	Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$
Agriculture	Coefficient	10.454	- 0.8881	0.182	16.06	9.1348	- 0.9019	0.197	25.49
	t-Value	2.6145	- 1.7029	(0.119)		2.3613	- 1.7874	(0.136)	
Mining	Coefficient	- 0.0789	0.1489	0.003	75.47	- 1.3977	0.1351	0.003	-227.74
	t-Value	- 0.0144	0.2088	(-0.073)		- 0.2480	0.1837	(-0.074)	
Manufacturing	Coefficient	6.0879	- 0.1719	0.075	3.94	4.7691	- 0.1858	0.138	4.33
	t-Value	4.7428	- 1.0269	(0.004)		4.8245	- 1.4409	(0.071)	
Construction	Coefficient	11.266	- 1.0224	0.366	12.22	9.9470	- 1.0362	0.375	20.76
	t-Value	3.9359	- 2.7384	(0.317)		3.4974	- 2.7933	(0.327)	
Energy	Coefficient	- 5.1514	0.8670	0.200	36.23	- 6.4703	0.8532	0.185	847.53
	t-Value	- 1.3981	1.8040	(0.139)		- 1.6972	1.7158	(0.122)	
Commerce	Coefficient	2.0172	0.2872	0.152	5.02	0.6984	0.2734	0.174	6.64
	t-Value	1.3967	1.5247	(0.086)		0.5521	1.6568	(0.111)	
Transport	Coefficient	3.6117	- 0.0368	0.003	6.40	2.2928	- 0.0507	0.007	9.67
	t-Value	2.4841	- 0.1943	(-0.074)		1.8254	- 0.3094	(-0.069)	
Services	Coefficient	0.9533	0.4882	0.415	3.85	- 0.3656	0.4744	0.500	4.53
	t-Value	0.7727	3.0339	(0.370)		- 0.3623	3.6041	(0.461)	

Table 6*

Per Capita Income and Structural Change in 40 Developing and in 15 Developed Countries: Employment

Independent Variable: Per Capita Income

Sector		Dependent Variable							
		Persons employed per 1000 inhabitants				Sectoral percentage share in total employment			
		Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$	Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$
Agriculture	Coefficient	8.7030	- 0.6560	0.679	10.51	7.9301	- 0.7290	0.787	11.99
	t-Value	22.4083	-10.5875	(0.673)		24.2717	-13.9857	(0.783)	
Mining	Coefficient	- 0.2393	0.1763	0.027	134.73	- 1.0122	0.1034	0.009	-311.52
	t-Value	- 0.2628	1.2141	(0.009)		- 1.0937	0.7001	(-0.010)	
Manufacturing	Coefficient	0.2115	0.5863	0.570	14.38	- 0.5614	0.5133	0.521	20.45
	t-Value	0.4828	8.3884	(0.562)		- 1.3235	7.5859	(0.512)	
Construction	Coefficient	- 0.7576	0.5486	0.333	31.93	- 1.5305	0.4756	0.291	57.18
	t-Value	- 1.1344	5.1487	(0.321)		- 2.3926	4.6601	(0.277)	
Energy	Coefficient	- 3.3685	0.6461	0.443	125.99	- 4.1414	0.5731	0.324	-149.20
	t-Value	- 5.4031	6.4957	(0.433)		- 5.8076	5.0375	(0.311)	
Commerce	Coefficient	0.7179	0.4481	0.580	11.84	- 0.0550	0.3751	0.501	17.94
	t-Value	2.1887	8.5624	(0.572)		- 0.1704	7.2880	(0.491)	
Transport	Coefficient	- 0.3640	0.4792	0.635	15.16	- 1.1369	0.4062	0.515	31.11
	t-Value	- 1.1639	9.6029	(0.628)		- 3.3502	7.5026	(0.506)	
Services	Coefficient	1.3212	0.4397	0.700	7.72	0.5483	0.3667	0.472	14.92
	t-Value	5.3301	11.1182	(0.694)		1.6434	6.8892	(0.462)	

Table 7* Per Capita Income and Structural Change in 40 Developing Countries: Labour Productivity | Per Capita Income and Structural Change in 15 Developed Countries: Labour Productivity

Independent Variable: Per Capita Income

Sector		Dependent Variable							
		Sectoral Value Added per Employee				Sectoral Value Added per Employee			
		Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$	Constant	Per Capita Income	R^2	$Sy.x/\bar{y} \cdot 100$
Agriculture	Coefficient	0.6125	0.9810	0.735	6.13	- 1.2017	1.2004	0.443	5.25
	t-Value	1.1344	10.2756	(0.728)		- 0.4196	3.2135	(0.340)	
Mining	Coefficient	2.8168	0.8514	0.249	12.40	- 0.2581	1.2065	0.259	7.08
	t-Value	2.0790	3.5535	(0.230)		- 0.0595	2.1330	(0.202)	
Manufacturing	Coefficient	2.2032	0.8736	0.622	6.11	1.7177	0.8998	0.713	2.06
	t-Value	3.5272	7.9092	(0.612)		1.4149	5.6821	(0.691)	
Construction	Coefficient	3.6195	0.6140	0.144	13.53	- 5.2231	1.8007	0.765	3.62
	t-Value	2.6331	2.5259	(0.121)		- 2.4640	6.5128	(0.747)	
Energy	Coefficient	1.2955	1.1309	0.406	11.42	9.3473	0.0091	0.00003	5.54
	t-Value	1.0318	5.0938	(0.390)		2.6244	0.0195	(-0.077)	
Commerce	Coefficient	3.1329	0.7599	0.487	6.72	3.8168	0.5945	0.333	3.13
	t-Value	4.3798	6.0079	(0.474)		2.1326	2.5464	(0.281)	
Transport	Coefficient	4.0329	0.5892	0.332	7.26	0.5479	1.0547	0.718	2.40
	t-Value	5.2606	4.3463	(0.315)		0.3895	5.7486	(0.696)	
Services	Coefficient	2.8265	0.7738	0.595	5.69	1.5373	0.9256	0.625	2.59
	t-Value	4.8221	7.4655	(0.584)		1.0076	4.6510	(0.596)	

Table 8*

Per Capita Income and Structural Change in 40 Developing and in 15 Developed Countries: Labour Productivity

Independent Variable: Per capita Income

Sector		Dependent Variable: Value Added per Employee			
		Constant	Per Capita Income	R^2	$Sy \cdot x/\bar{y} \cdot 100$
Agriculture	Coefficient	0.8430	0.9378	0.875	5.78
	t-Value	2.7652	19.2810	(0.873)	
Mining	Coefficient	3.4588	0.7318	0.456	10.84
	t-Value	5.0282	6.6682	(0.446)	
Manufacturing	Coefficient	2.7531	0.7720	0.825	5.11
	t-Value	9.0041	15.8257	(0.822)	
Construction	Coefficient	2.9872	0.7273	0.466	11.27
	t-Value	4.4558	6.8001	(0.456)	
Energy	Coefficient	2.4885	0.9138	0.601	9.91
	t-Value	3.8838	8.9390	(0.594)	
Commerce	Coefficient	4.2858	0.5475	0.623	6.01
	t-Value	11.6951	9.3653	(0.616)	
Transport	Coefficient	3.8169	0.6277	0.678	6.09
	t-Value	10.2523	10.5687	(0.672)	
Services	Coefficient	3.0523	0.7316	0.825	4.82
	t-Value	10.5148	15.7979	(0.822)	

Table 9*

Determinants of Structural Change in 40 Developing Countries: Production

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Sectoral Per Capita Value Added		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture[a]	Coefficient	4.3441	- 0.5432	0.5616				0.608	28.6	10.46
	t-Value	4.6055	- 6.1498	2.8115				(0.586)		
	Beta Weight		- 0.6523	0.2982						
Agriculture[b]	Coefficient	- 0.2611	0.4568	0.5616				0.443	14.7	7.95
	t-Value	- 0.2270	5.1715	2.8115				(0.442)		
	Beta Weight		0.6538	0.3554						
Mining	Coefficient	- 3.7985	1.1545				- 0.3592	0.230	5.5	112.29
	t-Value	- 1.5648	2.7612				- 1.9416	(0.188)		
	Beta Weight		0.3985				- 0.2802			
Manufacturing	Coefficient	- 6.0203	1.4924		0.1518			0.883	140.2	9.19
	t-Value	- 9.3216	16.7435		4.4846			(0.877)		
	Beta Weight		0.9734		0.2607					
Construction	Coefficient	- 3.6869	1.2582			- 0.0732		0.825	87.2	15.89
	t-Value	- 4.4237	12.0430			- 1.9797		(0.816)		
	Beta Weight		0.8600			- 0.1414				
Energy	Coefficient	- 8.1769	1.8937	- 0.4133				0.815	81.6	57.59
	t-Value	- 4.8850	12.0707	- 1.1649				(0.805)		
	Beta Weight		0.8788	- 0.0848						
Commerce	Coefficient	- 2.1965	1.0832	- 0.0533				0.835	93.4	8.46
	t-Value	- 2.5083	13.1981	- 0.2872				(0.826)		
	Beta Weight		0.9087	- 0.0198						
Transport	Coefficient	- 2.2510	1.0207			- 0.0597		0.755	57.0	14.42
	t-Value	- 2.6893	9.7276			- 1.6085		(0.742)		
	Beta Weight		0.8223			- 0.1360				
Services	Coefficient	- 2.7965	1.1999				0.0326	0.865	118.9	7.57
	t-Value	- 6.1631	15.3521				0.9423	(0.858)		
	Beta Weight		0.9266				0.0569			

[a]Percentage share in GDP. - [b]Per capita value added.

Table 10[35]
Determinants of Structural Change in 15 Developed Countries: Production

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Sectoral Per Capita Value Added		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture[a]	Coefficient	8.0385	- 0.6264		- 0.1572			0.406	4.1	22.11
	t-Value	3.0974	- 1.8859		- 1.9658			(0.307)		
	Beta Weight		- 0.4216		- 0.4395					
Agriculture[b]	Coefficient	3.4334	0.3736		- 0.1572			0.284	2.4	7.85
	t-Value	1.3230	1.1246		- 1.9658			(0.165)		
	Beta Weight		0.2760		- 0.4824					
Mining	Coefficient	7.2004	0.6410	- 3.3466		0.2724		0.572	4.9	21.78
	t-Value	0.8935	0.9407	- 1.8614		2.4916		(0.455)		
	Beta Weight		0.2078	- 0.3675		0.5499				
Manufacturing	Coefficient	- 0.5192	0.8808				0.0618	0.855	35.3	1.65
	t-Value	- 0.6214	8.4042				3.4720	(0.831)		
	Beta Weight		1.0189				0.4209			
Construction	Coefficient	- 0.1644	0.8177		- 0.1011			0.730	16.2	3.42
	t-Value	- 0.1351	5.2502		- 2.6970			(0.685)		
	Beta Weight		0.7908		- 0.4062					
Energy	Coefficient	2.9137	0.8976	- 1.5534				0.747	17.7	4.82
	t-Value	1.2900	5.2262	- 3.0641				(0.705)		
	Beta Weight		0.7593	- 0.4452						
Commerce	Coefficient	0.7765	0.8888	- 0.5109				0.648	11.1	3.78
	t-Value	0.3089	4.6501	- 0.9055				(0.590)		
	Beta Weight		0.7966	- 0.1551						
Transport	Coefficient	- 1.9200	1.0644		- 0.1195			0.681	12.8	4.98
	t-Value	- 1.0942	4.7396		- 2.2110			(0.628)		
	Beta Weight		0.7762		- 0.3621					
Services	Coefficient	- 4.0245	1.2853			0.0460		0.864	38.2	2.88
	t-Value	- 3.1310	6.9878			1.5576		(0.842)		
	Beta Weight		0.8316			0.1854				

[a]Perdentage share in GDP. - [b]Per capita value added.

Table 11[a] Determinants of Structural Change in 40 Developing Countries and in 15 Developed Countries: Production

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Sectoral Per Capita Value Added		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture[a]	Coefficient	6.3739	- 0.7314	0.4578	- 0.0735			0.836	86.4	12.74
	t-Value	9.9301	-15.3846	2.3431	- 2.3279			(0.826)		
	Beta Weight		- 0.9157	0.1456	- 0.1408					
Agriculture[b]	Coefficient	1.7688	0.2686	0.4578	- 0.0735			0.480	15.7	8.16
	t-Value	2.7556	5.6495	2.3431	- 2.3279			(0.449)		
	Beta Weight		0.5984	0.2590	- 0.2506					
Mining	Coefficient	- 2.9179	0.9591				- 0.3044	0.364	14.9	75.63
	t-Value	- 2.4289	5.1680				- 2.3378	(0.339)		
	Beta Weight		0.5756				- 0.2604			
Manufacturing	Coefficient	- 4.4035	1.3239		0.1451	- 0.0514		0.956	371.4	7.28
	t-Value	-11.4224	31.6726		4.2322	- 1.6807		(0.954)		
	Beta Weight		0.9449		0.1584	- 0.0620				
Construction	Coefficient	- 3.8836	1.2831			- 0.0678		0.940	406.5	11.06
	t-Value	- 9.2402	28.5049			- 2.5465		(0.938)		
	Beta Weight		0.9711			- 0.0868				
Energy	Coefficient	-26.102	1.6252	- 0.8869	- 3.0855	3.0524	3.1194	0.914	103.9	29.52
	t-Value	- 2.1489	22.2660	- 2.6907	- 1.7326	1.7014	1.7288	(0.905)		
	Beta Weight		0.9852	- 0.1365	- 2.8615	3.1263	2.6951			
Commerce	Coefficient	- 1.4381	1.0067	- 0.1515				0.934	369.5	6.81
	t-Value	- 2.7804	26.3081	- 1.0055				(0.932)		
	Beta Weight		0.9766	- 0.0373						
Transport	Coefficient	- 3.0343	1.1227		- 0.0574			0.917	288.3	10.78
	t-Value	- 8.2690	23.8843		- 1.8685			(0.914)		
	Beta Weight		0.9685		- 0.0758					
Services	Coefficient	- 2.6137	1.1683		0.0109			0.954	533.2	6.02
	t-Value	- 9.1808	32.0365		0.4555			(0.952)		
	Beta Weight		0.9739		0.0138					

[a]Percentage share in GDP. - [b]Per capita value added.

Table 12*

Determinants of Structural Change in 40 Developing Countries: Employment I

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Persons Employed per 1000 Inhabitants		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	3.0536	- 0.4463	1.2984				0.759	58.2	5.86
	t-Value	3.7162	- 5.7944	7.4553				(0.746)		
	Beta Weight		- 0.4817	0.6198						
Mining	Coefficient	0.1405	0.2994				- 0.3084	0.140	3.0	155.98
	t-Value	0.0792	0.9801				- 2.2822	(0.094)		
	Beta Weight		0.1495				- 0.3481			
Manufacturing	Coefficient	25.7780	0.6720	0.7801	4.4971	- 4.3679	- 4.2806	0.579	9.3	13.88
	t-Value	1.8179	5.1484	2.3269	2.1580	- 2.0794	- 2.0281	(0.517)		
	Beta Weight		0.6093	0.3128	10.7362	-11.1883	- 8.7733			
Construction	Coefficient	- 4.7229	0.7273	1.4395		- 0.1643		0.387	7.6	35.07
	t-Value	- 1.9122	3.3107	2.9360		- 2.1226		(0.336)		
	Beta Weight		0.4570	0.400		- 0.2916				
Energy	Coefficient	- 0.7088	0.7143	- 0,8720				0.320	8.7	282.42
	t-Value	- 0.3029	3.2563	- 1.7580				(0.283)		
	Beta Weight		0.4546	- 0,3029						
Commerce	Coefficient	- 0.6745	0.3808			0.0876	0.1984	0.411	8.4	12.45
	t-Value	- 0.6858	3.5853			2.0342	3.8236	(0.362)		
	Beta Weight		0.4795			0.3117	0.5645			
Transport	Coefficient	- 1.6274	0.5461		0.1011			0.421	13.5	17.70
	t-Value	- 2.0778	5.0526		2.4621			(0.390)		
	Beta Weight		0.6544		0.3189					
Services	Coefficient	0.1676	0.4949		0.0969			0.500	18.5	8.43
	t-Value	0.2748	5.8819		3.0312			(0.473)		
	Beta Weight		0.7081		0.3649					

Table 13* Determinants of Structural Change in 15 Developed Countries: Employment I

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Persons Employed per 1000 Inhabitants		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	12.724	- 1.1331				- 0.0990	0.247	2.0	16.04
	t-Value	2.7802	- 1.9739				- 1.0156	(0.122)		
	Beta Weight		- 0.5449				- 0.2803			
Mining	Coefficient	1.5204	- 0.3743			0.1873		0.167	1,2	71.80
	t-Value	0.2866	- 0.4930			1.5367		(0.028)		
	Beta Weight		- 0.1453			0.4529				
Manufacturing	Coefficient	1.9333	- 0.1878	1.1472				0.458	5.1	3.14
	t-Value	1.1009	- 1.4065	2.9103				(0.367)		
	Beta Weight		- 0.2992	0.6192						
Construction	Coefficient	12.679	- 0.9429		- 0.2039			0.615	9.6	9.91
	t-Value	5.3353	- 3.1000		- 2.7856			(0.551)		
	Beta Weight		- 0.5578		- 0.5012					
Energy	Coefficient	- 3.6897	0.3888			0.1712		0.442	4.8	31.50
	t-Value	- 1.1295	0.8318			2.2810		(0.349)		
	Beta Weight		0.2007			0.5503				
Commerce	Coefficient	- 1.4908	0.2738	0.9687				0.349	3.2	4.58
	t-Value	- 0.6596	1.5932	1.9095				(0.241)		
	Beta Weight		0.3713	0.4450						
Transport	Coefficient	0.2945	- 0.0139	1.1035	- 0.0980			0.605	5.6	4.38
	t-Value	0.1719	- 0.1068	2.8698	- 3.1146			(0.497)		
	Beta Weight		- 0.0204	0.5460	- 0.5947					
Services	Coefficient	- 2.6185	0.4745	0.9863				0.608	9.3	3.28
	t-Value	- 1.4523	3.4614	2.4372				(0.543)		
	Beta Weight		0.6258	0.4406						

Table 14* Determinants of Structural Change in 40 Developing Countries and in 15 Developed Countries: Employment I

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Persons Employed per 1000 Inhabitants		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	5.7505	- 0.7179	1.1528	- 0.0809			0.794	65.6	8.57
	t-Value	8.0301	-13.5343	5.2885	- 2.2975			(0.782)		
	Beta Weight		- 0.9017	0.3677	- 0.1555					
Mining	Coefficient	0.3036	0.2123				- 0.2145	0.107	3.1	130.29
	t-Value	0.3316	1.5009				- 2.1618	(0.073)		
	Beta Weight		0.1980				- 0.2852			
Manufacturing	Coefficient	- 0.3308	0.5321		0.2363	- 0.1015		0.706	40.9	12.11
	t-Value	- 0.5980	8.8724		4.8049	- 2.3122		(0.689)		
	Beta Weight		0.6854		0.4657	- 0.2209				
Construction	Coefficient	- 2.3149	0.4799	1.2120		- 0.1853		0.491	16.4	28.43
	t-Value	- 1.6580	4.8450	3.0258		- 3.2068		(0.461)		
	Beta Weight		0.5052	0.3240		- 0.3295				
Energy	Coefficient	- 0.7049	0.7093	- 0.8661				0.490	25.0	121.69
	t-Value	- 0.5199	7.0716	- 2.1929				(0.471)		
	Beta Weight		0.7309	- 0.2266						
Commerce	Coefficient	- 1.1630	0.3887	0.3813	0.0733		0.0677	0.708	30.3	10.16
	t-Value	- 1.8262	8.2320	1.9674	2.2072		2.0082	(0.685)		
	Beta Weight		0.6609	0.1646	0.1906		0.1642			
Transport	Coefficient	- 0.7971	0.4629		0.0591			0.657	49.8	14.84
	t-Value	- 2.0563	9.3228		1.8215			(0.644)		
	Beta Weight		0.7698		0.1504					
Services	Coefficient	0.8088	0.4204		0.0700			0.740	74.0	7.26
	t-Value	2.7426	11.1295		2.8332			(0.730)		
	Beta Weight		0.8000		0.2036					

Table 15*

Determinants of Structural Change in 40 Developing Countries: Employment II

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Sectoral Percentage Share in Total Employment		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	5.3562	- 0.4463	0.2984				0.542	21.9	7.59
	t-Value	6.5184	- 5.7944	1.7133				(0.517)		
	Beta Weight		- 0.6640	0.1963						
Mining	Coefficient	- 1.5898	0.4055				- 0.3126	0.157	3.4	-318.60
	t-Value	- 0.8950	1.3253				- 2.3094	(0.112)		
	Beta Weight		0.2001				- 0.3488			
Manufacturing	Coefficient	- 0.5248	0.6653	- 0.5556	0.2727	- 0.1075		0.554	10.9	21.61
	t-Value	- 0.3440	4.8860	- 1.8260	4.1898	- 1.8059		(0.503)		
	Beta Weight		0.5859	- 0.2164	0.6324	- 0.2723				
Construction	Coefficient	- 0.8313	0.6895			- 0.1528		0.341	9.6	68.96
	t-Value	- 0.4846	3.2067			- 2.0073		(0.306)		
	Beta Weight		0.4443			- 0.2781				
Energy	Coefficient	1.5937	0.7143	- 1.8720				0.468	16.3	98.46
	t-Value	0.6810	3.2563	- 3.7739				(0.440)		
	Beta Weight		0.4020	- 0.4659						
Commerce	Coefficient	0.8291	0.4119	- 0.6119	0.0737		0.1141	0.520	9.5	18.94
	t-Value	0.7289	3.9047	- 2.5983	1.7282		2.4185	(0.465)		
	Beta Weight		0.4861	- 0.3193	0.2290		0.3044			
Transport	Coefficient	- 0.0684	0.5633	- 0.7965	0.0947			0.550	14.7	31.19
	t-Value	- 0.0570	5.0942	- 3.2061	2.2577			(0.513)		
	Beta Weight		0.6006	- 0.3755	0.2659					
Services	Coefficient	3.4394	0.4725	- 1.2652	0.1051			0.721	31.0	11.95
	t-Value	3.7415	5.5840	- 6.6554	3.2746			(0.698)		
	Beta Weight		0.5186	- 0.6141	0.3038					

Table 16*

Determinants of Structural Change in 15 Developed Countries: Employment II

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Sectoral Percentage Share in Total Employment		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	11.5060	- 1.1578				- 0.1034	0.271	2.2	25.27
	t-Value	2.6171	- 2.0996				- 1.1042	(0.150)		
	Beta Weight		- 0,5702				- 0.2999			
Mining	Coefficient	- 1.3977	0.1351					0.003	0.03	-227.74
	t-Value	- 0.2480	0.1837					(-0.074)		
	Beta Weight		0.0509							
Manufacturing	Coefficient	3.6379	- 0.0637				0.0493	0.415	4.3	3.71
	t-Value	3.7454	- 0.5228				2.3840	(0.317)		
	Beta Weight		- 0.1272				0.5802			
Construction	Coefficient	11.401	- 0.9545		- 0.2098			0.638	10.6	16.44
	t-Value	4.9447	- 3.2344		- 2.9538			(0.578)		
	Beta Weight		- 0.5641		- 0.5152					
Energy	Coefficient	- 5.0049	0.3738			0.1717		0.416	4.3	746.45
	t-Value	- 1.4617	0.7628			2.1815		(0.319)		
	Beta Weight		0.1883			0.5384				
Commerce	Coefficient	0.6984	0.2734					0.174	2.7	6.64
	t-Value	0.5521	1.6568					(0.111)		
	Beta Weight		0.4175							
Transport	Coefficient	2.9678	- 0.0127		- 0.0974			0.469	5.3	7.36
	t-Value	3.0326	- 0.1017		- 3.2307			(0.381)		
	Beta Weight		- 0.0215		- 0.6825					
Services	Coefficient	- 0.3066	0.4777		- 0.0085			0.503	6.1	4.70
	t-Value	- 0.2860	3.4812		- 0.2576			(0.420)		
	Beta Weight		0.7119		- 0.0527					

Table 17* Determinants of Structural Change in 40 Developing Countries and in 15 Developed Countries: Employment II

Dependant Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Sectoral Percentage Share in Total Employment		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	8.4688	- 0.7088		- 0.0735			0.805	107.3	11.58
	t-Value	21.2005	-13.8508		- 2.1988			(0.797)		
	Beta Weight		- 0.8624		- 0.1369					
Mining	Coefficient	- 0.4441	0.1410				- 0.2245	0.096	2.8	-300.44
	t-Value	- 0.4784	0.9831				- 2.2316	(0.061)		
	Beta Weight		0.1305				- 0.2963			
Manufacturing	Coefficient	0.2109	0.5087	- 0.6126	0.1155		0.1049	0.666	24.9	17.57
	t-Value	0.2560	8.3241	- 2.4425	2.6893		2.4023	(0.639)		
	Beta Weight		0.7149	- 0.2187	0.2485		0.2101			
Construction	Coefficient	0.5580	0.4946			- 0.1783		0.407	17.8	52.79
	t-Value	0.6331	5.2396			- 3.1918		(0.384)		
	Beta Weight		0.5607			- 0.3416				
Energy	Coefficient	1.5977	0.7093	- 1.8661				0.527	29.0	-125.99
	t-Value	1.1785	7.0716	- 4.7248				(0.509)		
	Beta Weight		0.7042	- 0.4705						
Commerce	Coefficient	1.1396	0.3887	- 0.6187	0.0733		0.0677	0.641	22.3	15.66
	t-Value	1.7894	8.2320	- 3.1921	2.2072		2.0082	(0.612)		
	Beta Weight		0.7332	- 0.2963	0.2115		0.1821			
Transport	Coefficient	1.0087	0.4571	- 0.6977				0.605	39.8	28.35
	t-Value	1.4489	8.8749	- 3.4399				(0.590)		
	Beta Weight		0.8076	- 0.3130						
Services	Coefficient	3.7043	0.4334	- 1.2179	0.0805			0.757	52.9	10.33
	t-Value	7.1008	11.2177	- 7.6700	3.1372			(0.742)		
	Beta Weight		0.8124	- 0.5797	0.2309					

Table 18*

Determinants of Labour Productivity (Value Added per Employee) in 40 Developing Countries

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Value added per Employee		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	3.5931	0.9031	- 0.7368				.812	79.8	5.24
	t-Value	4.0082	10.7481	- 3.878				(.802)		
	Beta Weight		0.7894	- 0.2848						
Mining	Coefficient	5.3614	0.7848	- 0.6290				.275	7.0	12.36
	t-Value	2.0440	3.1924	- 1.1314				(.235)		
	Beta Weight		0.4604	- 0.1632						
Manufacturing	Coefficient	-19.291	0.8114	- 0.7681	- 3.5540	3.5652	3.4941	.736	18.9	5.40
	t-Value	- 1.7111	7.8192	- 2.8818	- 2.1452	2.1349	2.0823	(.697)		
	Beta Weight		0.7325	- 0.3067	- 8.448	9.0929	7.1304			
Construction	Coefficient	8.7554	0.4797	- 1.2696				.257	6.4	12.77
	t-Value	3.4726	2.0298	- 2.3758				(.217)		
	Beta Weight		0.2962	- 0.3467						
Energy	Coefficient	1.6000	1.1385				- 0.1017	.422	13.5	11.41
	t-Value	1.2419	5.1300				- 1.0355	(.391)		
	Beta Weight		0.6413				- 0.1294			
Commerce	Coefficient	6.2091	0.6699	- 0.4384	- 0.0763		- 0.1154	.65	16.3	5.79
	t-Value	4.9777	5.7904	- 1.6974	- 1.6314		- 2.2302	(.61)		
	Beta Weight		0.6153	- 0.1781	- 0.1845		- 0.2396			
Transport	Coefficient	6.0941	0.4766		- 0.1644			.499	18.4	6.38
	t-Value	6.8256	3.8683		- 3.5121			(.472)		
	Beta Weight		0.4662		- 0.4243					
Services	Coefficient	3.9166	0.7143		- 0.0869			.643	33.3	5.41
	t-Value	5.2955	6.9978		- 2.2422			(.624)		
	Beta Weight		0.7118		- 0.2281					

Table 19*

Determinants of Labour Productivity (Value Added per Employee) in 15 Developed Countries

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Value added per Employee		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	- 3.7876	1.2195	- 1.3777				.510	6.2	5.13
	t-Value	- 0.7889	3.3405	- 1.2785				(.428)		
	Beta Weight		0.6759	- 0.2587						
Mining	Coefficient	- 3.0300	0.8516				- 0.1434	.364	3.4	6.82
	t-Value	- 0.6320	1.4163				- 1.4041	(.258)		
	Beta Weight		0.3594				- 0.3563			
Manufacturing	Coefficient	5.4213	0.9139	- 1.0227				.818	27.1	1.71
	t-Value	3.1426	6.9672	- 2.6412				(.788)		
	Beta Weight		0.8576	- 0.3251						
Construction	Coefficient	- 5.3357	1.7606		0.1028			.808	25.3	3.41
	t-Value	- 2.9062	6.7350		1.6344			(.776)		
	Beta Weight		0.8554		0.2076					
Energy	Coefficient	45.3720	- 0.1521		4.4571	- 4.7008	- 4.6688	.538	2.9	4.30
	t-Value	2.3893	- 0.3108		1.8561	- 1.9630	- 1.9176	(.353)		
	Beta Weight		- 0.0908		11.0562	-17.4755	-16.4093			
Commerce	Coefficient	8.7146	0.7735	- 1.4862		- 0.0567		.663	7.2	2.42
	t- Value	3.6478	3.8292	- 2.7884		- 1.7502		(.571)		
	Beta Weight		0.7506	- 0.4886		- 0.3428				
Transport	Coefficient	4.9927	1.0717	- 1.2274				.829	29.1	1.94
	t-Value	2.5526	7.2056	- 2.7956				(.801)		
	Beta Weight		0.8608	- 0.3340						
Services	Coefficient	1.9800	0.7807			0.0519		.685	13.1	2.47
	t-Value	1.3355	3.6799			1.5223		(.633)		
	Beta Weight		0.6666			0.2758				

Table 20*

Determinants of Labour Productivity (Value-Added per Employee) in 40 Developing Countries and 15 Developed Countries

Dependent Variable		Independent Variables						R^2	F	$Sy \cdot x/\bar{y} \cdot 100$
Value added per Employee		Constant	Per Capita Income	Participation Rate	Population	Country Size (km^2)	Population per km^2			
Agriculture	Coefficient	2.9380	0.9875	- 0.6812				.903	240.8	5.16
	t-Value	4.7976	21.7962	- 3.8184				(.899)		
	Beta Weight		0.9851	- 0.1726						
Mining	Coefficient	5.6465	0.7837	- 0.7114				.482	24.2	10.69
	t-Value	3.6991	6.9399	- 1.5997				(.462)		
	Beta Weight		0.7234	- 0.1667						
Manufacturing	Coefficient	4.5328	0.8206	- 0.5296			- 0.0596	.860	104.4	4.67
	t-Value	7.1926	17.5682	- 2.8879			- 1.8917	(.852)		
	Beta Weight		0.9657	- 0.1583			- 0.1000			
Construction	Coefficient	5.0524	0.7958	- 1.1054		0.1139		.541	20.1	10.65
	t-Value	3.3978	7.5442	- 2.5913		1.8518		(.514)		
	Beta Weight		0.7469	- 0.2635		0.1807				
Energy	Coefficient	3.1257	0.9377		- 0.0870			.614	41.3	9.85
	t-Value	3.8768	9.0795		- 1.2885			(.599)		
	Beta Weight		0.7957		- 0.1129					
Commerce	Coefficient	6.5851	0.6129	- 0.4946	- 0.1062			.731	46.1	5.18
	t-Value	9.2275	11.5951	- 2.2768	- 3.0260			(.715)		
	Beta Weight		0.8837	- 0.1811	- 0.2344					
Transport	Coefficient	4.6705	0.6598		- 0.1165			.731	70.7	5.62
	t-Value	10.7370	11.8414		- 3.1993			(.721)		
	Beta Weight		0.8656		- 0.2339					
Services	Coefficient	3.4853	0.7479		- 0.5910			.837	133.5	4.70
	t-Value	9.7378	16.3128		- 1.972			(.831)		
	Beta Weight		0.9284		- 0.1122					

Table 21* Test of Differences in the Pattern of Structural Change between 40 Developing Countries and 15 Developed Countries

Dependent Variable			Independent Variables			R^2	F
I Value Added per Capita		Constant	Per Capita Income	Dummy I	Dummy II		
Manufacturing	Coefficient	0.8978	0.7278	- 4.9375	0.6453	0.943	286.4
	t-Value	2.2038	2.2346	- 1.9357	1.9070	(0.94)	
	Beta Weight		0.5194	- 1.4807	1.1154		
Energy	Coefficient	- 2.7119	0.8761	- 7.1274	1.0595	0.914	183.9
	t-Value	0.524	1.859	- 1.9312	2.1639	(0.909)	
	Beta-Weight		0.5308	- 1.8149	1.555		
II Sectoral Percentage Share in GDP							
Manufacturing	Coefficient	5.5030	- 0.2722	- 5.0142	0.6606	0.555	21.2
	t-Value	2.2047	- 0.8360	- 1.9657	1.9510	(0.528)	
	Beta-Weight		- 0.5482	- 4.2301	3.2020		
Energy	Coefficient	1.8933	- 0.1239	- 7.1369	1.0614	0.610	26.6
	t-Value	0.5190	- 0.2605	- 1.9144	2.1449	(0.587)	
	Beta Weight		- 0.1598	- 3.8535	3.2927		
III Sectoral Percentage Share in Total Employment							
Agriculture	Coefficient	6.1306	- 0.5098	0.6123		0.813	113.1
	t-Value	8.3511	- 5.3705	2.7020		(0.806)	
	Beta Weight		- 0.6203	0.3121			
Construction	Coefficient	9.9470	- 1.0362	-13.2940	1.8420	0.390	10.9
	t-Value	1.9168	- 1.5309	- 2.5068	2.6167	(0.354)	
	Beta Weight		- 1.1747	- 6.3128	5.0257		
Energy	Coefficient	- 6.8892	0.9079	0.9350		0.365	14.9
	t-Value	- 4.1535	4.2330	1.8262		(0.340)	
	Beta Weight		0.9014	0.3889			
Services	Coefficient	- 0.7905	0.5298	0.4556		0.507	26.7
	t-Value	- 1.0214	5.2941	1.9069		(0.488)	
	Beta Weight		0.9930	0.3577			

Table 22*

List of Countries

Country	Per capita income in 1963 US$	Year	Country	Per capita income in 1963 US$	Year
I Developing Countries					
Argentina	649	1960	Liberia	266	1962
Botswana	82	1964	Malaysia, West	255	1957
Brazil	328	1970	Mauritius	275	1962
Ceylon	143	1963	Mexico	521	1970
Chile	396	1971	Nicaragua	367	1971
Colombia	281	1964	Pakistan	88	1961
Costa Rica	376	1963	Panama	402	1960
Cyprus	529	1960	Paraguay	203	1962
Dominican Republic	300	1960	Peru	227	1961
Ecuador	191	1962	Portugal	297	1960
El Salvador	229	1961	Puerto Rico	859	1960
Gabon	391	1963	Philippines	296	1970
Greece	970	1971	Sierra Leone	140	1963
Guatemala	310	1964	Spain	737	1970
Guyana	332	1965	Thailand	107	1960
Honduras	214	1961	Trinidad and Tobago	621	1960
India	86	1961	Tunisia	227	1966
Indonesia	70	1964-65	Turkey	267	1965
Jamaica	442	1960	Uruguay	615	1963
Jordan	191	1961	Zambia	304	1969
Korea, Rep. of	250	1971			
II Developed Countries					
Australia	1734	1971	Italy	1330	1971
Austria	1591	1971	Japan	1387	1971
Belgium	2075	1971	Norway	2161	1971
Canada	3193	1971	Netherlands	1845	1971
Denmark	2378	1971	Sweden	2921	1971
Finland	2018	1971	United Kingdom	1874	1971
France	2540	1971	United States	3936	1971
Germany	2292	1971			