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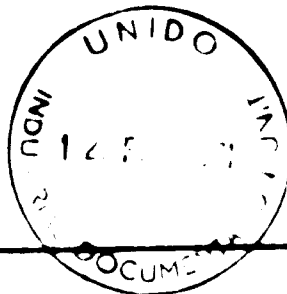
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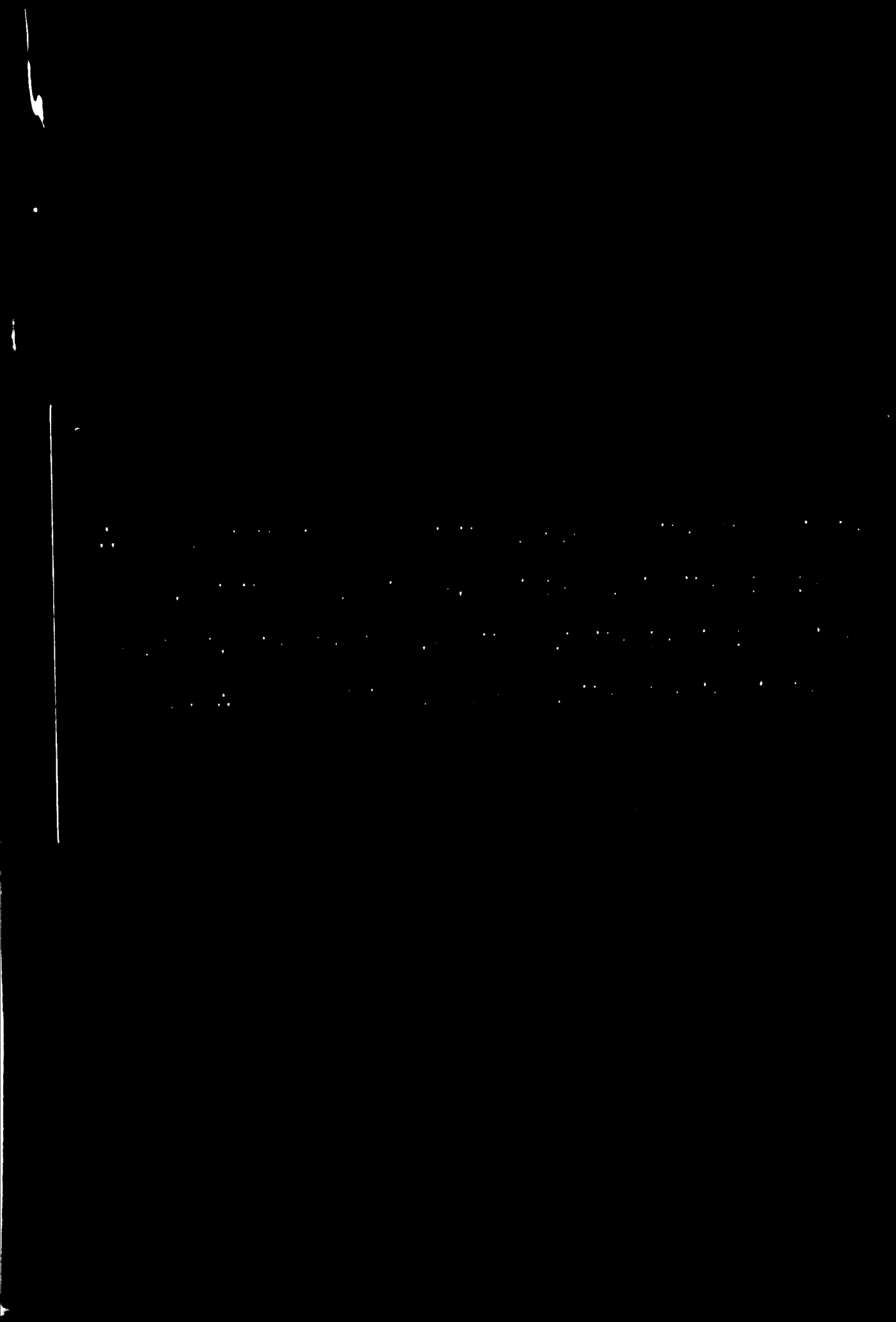
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FISCAL POLICY ASPECTS OF TECHNOLOGICAL CHANGES
IN THE INDUSTRIAL SECTOR AND EFFECTS ON
EMPLOYMENT IN DEVELOPING COUNTRIES

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FISCAL POLICY ASPECTS OF TECHNOLOGICAL CHANGES
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INTRODUCTION

Industrialisation is essential to economic development of many developing countries. There are expectations that directly or indirectly it will increase national output and income, contribute to higher domestic savings and provide the new basis and necessary resources for economic and social development. In this context the process of industrialization is expected to provide productive jobs for the abundant urban labour force as well as for the many underemployed who are tied up to the land or low productivity activities.

An essential element of modern processing is the application of capital-intensive techniques. These techniques are largely embodied in equipment and machines and are much more capital-intensive than the traditional methods of production still prevailing in developing countries. It is however through industrialisation that modern techniques of production and many new skills are being transferred to developing countries for the benefit of the whole economy. Expansion of industry in these countries contributes therefore much more to economic growth than providing a source of employment.

Industrialisation processes in developing countries bring in however a serious dilemma; on the one hand industry is expected, among other things, to create more employment opportunities, on the other hand the application of modern and capital-intensive techniques tends to engage a small proportion of the labour force in manufacturing industries and thus limits the direct spread of economic and social benefits of industrialization.

This paper discusses some fiscal policy measures required to narrow the areas of conflict between the more common effects of modern technological changes in industry and promotion of manufacturing employment in developing countries.

THE HIGH EXPECTATIONS OF INDUSTRIALIZATION
AND A LIMITED ROLE FOR AGRICULTURE

The high population growth and inability of agriculture to absorb the fast growing labour force has given fresh strength to the case for industrialization in developing countries, especially in those ones where the man/land ratio is high or rising. Estimates of the growth of labour force in the present decade all point to its accelerated growth, relative to the past decade in all developing regions^{1/} and underline the need for a general acceleration of economic growth. The high rate of growth of urban labour force, frequently 5 per cent per annum and more, and the widespread unemployment plaguing many big cities of the developing countries call for an urgent provision of more productive employment opportunities in industry and elsewhere.^{2/}

The high expectations of industrialization are reflected in the priority role typically assigned by developing countries to industry within the overall economic development effort of these countries.^{3/}

1/ See World and Regional Estimates and Projections of Labour Force by James N. Ypsilantis, Inter-regional Seminar on Long-Term Economic Projections for the World Economy, Elsinore, Denmark, 1966.

2/ In the case of Latin America it is argued that acceleration of the growth rate of GDP to 8 per cent per annum with a corresponding acceleration of industrial production from 5.9 to 9.7 per cent per annum are necessary to avoid a further deterioration of the "distortion of the employment structure of labour force" - a fast growth of the services sector hiding an open and disguised unemployment. See Raul Prebisch's report Transformacion y desarrollo: La gran tarea de America Latina, Washington, D.C. Mayo de 1970, pages 78 and 79 and passim Chapter IV.

3/ See Development Plans: Appraisal of Targets and Progress in Developing Countries; World Economic Survey 1964, Part I, United Nations, New York, 1965. See also, The Summaries of the Industrial Development Plans of Thirty Countries, UNIDO, United Nations, New York, 1970.

Realisation of these high expectations face however many obstacles. The dilemma of developing countries is more complex than the fact that industrial sector's modern technology is much more capital-intensive than the traditional methods of production and frequently requires expensive productive installation with heavy supplementary outlays on power, transportation and other facilities which can also be capital-intensive.

The point is that all these capital needs tend to raise the general level of capital requirements in the country and call also for many scarce skills to organize and make an efficient use of the newly established industries. Moreover, to cover their imports of capital goods and other essentials and to service their foreign borrowings the developing countries need to achieve a rapid and sustained rise in export earnings. So far their traditional export items have consisted mainly of raw materials, but for a number of reasons, mainly on the demand side, such trade has tended to be sluggish. These reasons include low income elasticity in importing countries, substitution of synthetics, economizing technical innovations and protective and tariff measures adopted by importing countries.

The persistence of these measures and limited opportunities offered by import substitution policies have made developing countries direct their development and commercial programmes towards the creation of opportunities for the export of manufactured goods. This is a relatively new but promising outlay for their products. The point however is that in addition to facing protective and tariff measures in this trade in developed countries in most cases the developing countries have not yet developed the necessary competitive strength in their present and potential export industries.

In order to build up their competitive strength to meet the external market conditions the developing countries will need to modernise their production process and to increase the level of labour productivity in many areas of manufacturing at a time when there are overall and pressing needs to increase the absorption of labour by manufacturing industry. These are largely conflicting objectives, if applied generally, all over industry.

Nevertheless there are good reasons to reckon with such conflicts in reviewing industry's immediate potential for providing employment. This situation may arise not only in a case of large scale processing of mineral resources for export but also as a more general trend in the more industrially advanced developing countries. In the latter case there emerges a need to gradually replace and/or modernize equipment and production processes in some of the industries established 20 or 30 years ago.^{4/} To forego altogether the existence of efficient, high productivity lines of production would severely reduce the chances of a successful competition in the export markets and would generally hamper prospects of industrial development of developing countries. Better prospects for combining an objective of expansion and modernization of industry with that of employment promotion seem to be offered by a selective choice of advanced technology and an appropriate choice of the country's industrial specialization. A need to evolve adequate policy measures towards such goals are particularly timely now. After years of negotiations a system of general preferences has recently been adopted which is expected to lead to potential advantages for the developing countries in the export of manufactures.^{5/}

II. EFFECT OF TECHNOLOGICAL CHANGE ON INDUSTRIAL EMPLOYMENT IN DEVELOPING COUNTRIES

The question has often been raised of the necessity for developing countries to design technologies which would take into account their factor endowments and other environmental factors. This raises a number of difficult problems, conceptual as well as practical. Finding concrete solutions would

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- ^{4/} This problem is particularly relevant to some of the Latin American countries and perhaps also to India but will inevitably emerge also in other developing countries undergoing industrialization since World War II.
- ^{5/} See reports on the session of a Special Committee of UNCTAD dealing with a preferential treatment to the exports of developing countries, Geneva, October 1970.

require very detailed analysis and probably the setting up by developing countries of their own national scientific research and design institutions. Until this is done developing countries will continue to use and to assimilate the modern technology devised by the industrially advanced countries. This technology is prompted by the relative scarcity of labour and abundance of capital and reflects conditions in their own economic environment. Consequently, the technological innovations originated there are primarily of a labour-saving nature. Different effects of technological innovations are required by countries where labour is abundant and capital and many industrial skills are scarce. What are the main issues of technological changes in the industrial sector of developing countries? Some insight into this problem is available through the examination of the past trends of manufacturing growth and technological changes which accompanied it in developing countries.

In the decade of 1950's a growth rate for manufacturing output by developing countries was found to be about 7 per cent per annum and about 4 per cent for manufacturing employment.^{6/} The comparative figures for the subsequent decade are not yet available. The available data for the period between 1960 and 1968 indicate however a growth rate of 6.2 per cent for output and about 4 per cent for employment.^{7/} The output growth rates point to a continued, though at the reduced pace, enlargement of manufacturing and infrastructure bases in developing countries in 1960's. As a matter of fact, manufacturing constitutes at present an integral part of the economy in some developing countries and makes a noteworthy contribution to domestic production. There are complex implications which these aggregate trends hold for employment. First of all, while the performance of manufacturing in

6/ See UNIDO, Industrial Development Survey, Vol. I, (United Nations publication Sales No. E.68.II.B.18, paras. 2 and 229).

7/ See UNIDO, Industrial Development Survey, op.cit. Vol. III, (in press).

These figures refer to the more modern sector of manufacturing. National statistics differ in regard to the scope of annual output and employment statistics but tend to report on bigger and more modern units; typically the cut-off line is employment of five or more persons.

these countries may be regarded as quite impressive, in terms of growth rates, this has had little employment effect for the large and rapidly increasing population and labour force of developing countries. The manufacturing sector absorbs only a modest part of the available labour resources. In a majority of countries for which the statistical data are available, the whole manufacturing sector (including very considerable artisan and handicraft employment) absorbed between one-tenth and two-tenths of the total economically active population in the early 1960's. The more modern sector of manufacturing accounts only for a fraction of this manufacturing labour, bringing down the size of modern industry employment frequently to less than 5 per cent of the economically active population.^{8/} Further, the efforts to increase output of manufactures in many developing countries have not generally resulted in a radical change in the share of total employment absorbed by manufacturing in the post-war years. Comparison of the number of persons engaged in manufacturing with the total number of economically active population, based on population census data for the early 1950's and the early 1960's, has indicated that of twenty-three developing countries only ten showed an increased share of manufacturing, seven a decline and six no change in manufacturing's share in the use of available labour.^{9/} Notwithstanding a possible margin of error in these comparisons^{10/} it is significant that in spite of some progress in industrialization no general shift towards an increasing allocation of manpower to the manufacturing sector took place in developing countries in the 1950's. The fragmentary data do not seem to herald any significant change in this aspect for the past decade. It would even appear that in some areas, particularly in Latin America, the recent

^{8/} For the estimates of modern sector employment see, International Labour Review, Vol. 90, No. 6, 1964 and Vol. 93, No. 2, 1966. See also ECLA, The Process of Industrial Development in Latin America (United Nations publication, Sales No. 66.II.C.4).

^{9/} See Industrial Development Survey, op.cit. Vol. I, pp. 240-249 and Table 83 on pages 250-251.

^{10/} Resulting from different concepts of economically active population census in 1950's and 1960's in the countries concerned and varying treatment of unemployed persons in the tabulation of census data.

sluggish advances in industrialization seemed to be accompanied by some improvements in output per man. Accordingly, "the resulting demand for labour by the manufacturing sector has not sufficed to keep pace with the growth of labour force, to say nothing of contributing to the reduction of the pool of unemployment and under-employment existing in that region".^{11/}

In considering the extent to which the expanding manufacturing production in the past involved an increase in the total manufacturing employment it seems useful to distinguish the three following aspects of this relationship: (1) labour requirements of the production techniques applied in new manufacturing investments; (2) trends of labour productivity of the already employed labour within the more modern factory sector and finally, (3) displacement of artisan labour by the factory sector in competitive activities.

(1) There are few systematically developed data on the aggregate labour requirements of new manufacturing investment and production technique in developing countries. This is a very neglected field of statistics and empirical research though the issue itself, of a proper choice of production technique in developing countries, is a subject of perennial theoretical controversies among economists and planners. Many observers and analysts of industrialization processes in developing countries conclude however the the choices actually made involve directly small labour requirements. The available, though fragmentary, data seem to support this contention. Be as it may, one has to bear in mind that the labour intensity cannot be the only criterion of manufacturing investment decisions, particularly in regard to the export industries. Besides, the desirability of attaining large labour absorption per unit of manufacturing investment does not yet mean that in reality there is much information about the alternatives or that alternative solutions are easily available. In many cases the decision to open up a new line of processing leaves little choice of the production techniques. Further, aid and credit arrangements, particularly those under which the creditors

11/ See Industrial Development Survey, Vol. II, op.cit. p. 62.

undertake to supply the machinery and equipment or even the whole plants on "turn-key" basis, frequently also leave the recipients with very little choice of the production techniques. Without rendering the actual choice of production techniques in developing countries, it seems that without developing its own industrial designing and production of capital goods which would try to incorporate into modern technology the conditions of their own economic and social environment, the developing countries have to reckon with the common effects of the modern technology transferred to them through manufacturing investment. It would however seem desirable, and possible, that social effects of modern industrial technology be alleviated through appropriate policy measures.

(2) The labour productivity gains have also tended to reduce the demand for new manufacturing labour. It seems, however, hardly possible to argue that developing countries could dispense with labour productivity increases involving those already employed in manufacturing, particularly in export industries.

First of all, these are, for most developing countries, newly established activities and are frequently heavily protected from foreign imports or subsidised. Thus, their long-run viability and potential for achieving international competitiveness primarily depends on productivity gains. Indeed, a major rationale for industrialization rests upon the notion that productivity is higher and is increasing more rapidly in modern manufacturing than in traditional activities. Given the inflationary pressure so common to those countries the need to improve the present competitive position of their manufacturing industries seems imperative. Moreover, empirical studies suggest that productivity gains in manufacturing are associated with growth rates of output. It is suggested that apart from some "autonomous" productivity gains, the latter is a function of the growth in total output. While a major

evidence for such a relationship relates to industrialized countries^{12/} there is some ground to expect that the similar relationship takes place in more industrially advanced developing countries. Low degrees of utilization of plant equipment and labour, typical of developing countries, cast even doubts whether the estimated gains in productivity reported for developing countries, ranging from 1 to 5 per cent per annum for different industries on the regional basis, represent the maximum possible gains.^{13/}

Sharing of the productivity benefits is a separate though very complex issue in developing countries. The adequate government policy towards profits and wages can direct these gains towards a further employment creation.

(3) Lastly, the relation between the expanding manufacturing production and the total demand for manufacturing labour involves also some replacement of artisan labour.^{14/} The artisan sector of manufacturing still continues to widely participate in many lines of processing in developing countries. Even among the most industrially advanced developing countries, the artisan sector in its various forms engages about a half of the total manufacturing employment. There is no uniformity in this respect among developing countries since the artisan tradition has been developed and preserved in varying degrees

^{12/} See N. Kaldor, Causes of the Slow Rate of Economic Growth of the United Kingdom, Cambridge University Press 1966, for a recent evidence regarding industrialised countries.

Preliminary examination of growth rates of output per man and rates of manufacturing production in 1960's for two-digit industries suggest that a similar relationship, though characterized by different numerical coefficients, may prevail in some Latin American countries. The Asian countries do not seem to share this experience. It is probable that the relationship is influenced by the share of artisan sector in the total manufacturing. In the Asian developing countries the share of the artisan sector in manufacturing seems to be much higher than in Latin America.

^{13/} See Industrial Development Survey, Vol. II and III, (latter document in press).

^{14/} To the extent that such displacement has in fact taken place, the industrialisation process of the past two decades might have directly resulted in a growth rate of a total manufacturing employment smaller than 4 per cent per annum credited earlier to the more modern sector of manufacturing in developing countries.

trial now. The point however, is that the substitution of factory methods of production for the traditional one, based on various forms of artisan and semi-artisan activity, constitutes a major technological change in developing countries' industrial sector.^{15/}

Employment effects of these technological changes appear very considerable in developing countries and seem to significantly differ from those experienced by the developed countries at a time when they were undergoing industrialization processes. The difference between capital intensity in those two areas of manufacturing were then apparently smaller than now. Labour productivity of industrial workers was also smaller and any additional worker in factory manufacturing, used to displace then a much smaller number of artisans than today.

There is not much empirical evidence on the aggregate pattern of growth of artisan and factory employment in various areas of manufacturing in developing countries. The available data pertain mostly to the Latin American region. What has occurred there may have however, some relevance for all developing countries since it is the region most advanced in industrialisation among the developing countries. Manufacturing factory employment in Latin America as a whole accounted for 48 per cent of the total of manufacturing factory and artisan employment in 1960. Between 1950 and 1965, manufacturing factory employment in the region increased at the rate of 3.2 per cent per annum. Since in the same period, employment in the artisan sector increased

^{15/} The distinction between the modern factory sector and traditional one lies mainly in the amount of power and equipment used and does not necessarily presuppose the size of establishments. This is well appreciated in industrial practice. The Indian manufacturing census, e.g. distinguishes between the establishments employing up to 20 or more workers and not using power, and those employing more than 10 workers using power. Under the modern factory sector, one should also understand various forms of subcontracting including home workers if they work for the factory sector.

at the rate of 1.4 per cent, the resulting growth rate for all manufacturing employment was, therefore, only 2.3 per cent.^{16/} Examination of the trends of manufacturing employment in the preceding two and a half decades (1925-1950), indicates that artisan employment grew throughout the period, although at a much slower rate than employment in the factory sector. While manufacturing factory employment grew during that period at the average rate of 4.1 per cent per annum, the artisan employment increased at the rate of 0.8 per cent per annum, leading to 2.2 per cent growth rate for the whole manufacturing sector.^{17/} Displacement of the artisan sector has therefore been relative rather than absolute. Not all artisan labour is substitutable, neither is all artisan labour easily transferable. At the same time, growth of manufacturing brings about directly, demand for some artisan activities (repairs and maintenance of industrial equipment) and tends to create indirectly some demand for artisan labour for repairs and servicing of consumer durables and other equipment produced by factory sector for local market.

A number of influences of a general nature may have been involved in the process of a shrinking artisan and cottage industry employment. Changes in the aggregate demand in favour for factory products, relative technical and economic advantages of factory production in the process of import substitution, easier availability of financial resources and government assistance for larger industrial investment, as well as many other factors have been contributing to a quicker expansion of factory manufacturing and employment. One has to reckon with these influences also in considering employment effects of broad technological changes in the industrial sector of developing countries in future.

^{16/} - Calculated from data given by Esteban Lederman, Los Recursos Humanos en el Desarrollo de América Latina, Cuadernos del Instituto Latinoamericano de Planificación Económica y Social, Serie II, No. 9, Santiago de Chile, 1969.

^{17/} See Structural Changes in Employment within the Context of Latin America's Economic Development, ECLA, Economic Bulletin for Latin America, Vol. X, No. 2, October 1965.

Attempts at explaining the low labour absorption of manufacturing emphasize also that the tendency for the relatively capital-intensive technique in manufacturing has been strengthened by "sharp distortions in the prices of the factors of production in relation to the levels that may have been considered as representative of their 'social cost' (for one reason, because of the import policy adopted and preferential treatment generally accorded to machinery and equipment); heavy increases in labour costs as a result of the levels and modes of financing social security expenditure; in some cases, a preference based on political and social considerations for techniques that limit the absolute volume of employment in individual enterprises, and thus made it difficult for trade unions to be placed on a strong footing, or even to be set up at all; and the incentive to adopt more automatic production process that stem from the shortage of trained personnel to handle equipment that is less costly but whose performance depends to a greater extent on the skill of the workers".^{18/} The above-mentioned list of possible factors contributing to the low labour absorption of the Latin American manufacturing is long and yet perhaps may not cover all possible causes. Income distribution is also credited with contributing to the low level of labour absorption by manufacturing. Income distribution affects mostly the level of employment through its effects on the pattern of consumption. The latter in turn is reflected in the different labour content of the expenditures of the rich and poor on the domestically manufactured goods and in the different import content of the expenditure of various income groups. The negative employment effects of the Latin America's pattern of income distribution have been stressed in many studies and reports.

The report of a country mission of the World Employment argues that "the basic goods which are widely purchased by those of low incomes, essentially food and rather simple manufactures like clothing and footwear, are precisely the goods which are (or can be) produced with techniques considerably more labour-intensive, than those used in the production of the goods demanded by

^{18/} See The Process of Industrial Development in Latin America, op.cit. page 74.

the rich. To produce the latter usually requires high capital intensity. A given amount of income will thus generate more employment when spent in the purchase of wage goods than in the acquisition of consumer durables".^{19/}

An earlier ECLA study noted that for Latin America, "the very diversification of manufacturing production in response to the changes in the demand and the possibilities of import substitution has led to more rapid development of the production lines that tended to be less labour-intensive in comparison with the traditional branches, whose naturally slow tempo of growth has been made even more sluggish by persistently regressive features in income distribution".^{20/}

The broad technological and institutional factors, as well as influences of income distribution over employment discussed above, do not seem to be peculiar to the Latin American region, but seem relevant to other regions' industrial development.

In his inquiry into the poverty of nations, Gunnar Myrdal notes that the modern sector of manufacturing in Asia has created backwash effect by turning out goods competing with those produced by traditional methods in small scale enterprises and crafts. He concludes his observations saying that "in the absence of spread effects, industrialisation can produce only a very small immediate expansion in demand for labour. This situation, of course, is an inescapable consequence of the low base from which modern industrial expansion begins, and the backwash effects that are certain to occur unless the output of modern industry is directed exclusively to new-created markets, either in foreign countries or in home territory. When a start must be made from such modest beginnings, as it must in all South Asian countries, even a big push towards industrial expansion cannot for decades ahead be expected to provide

^{19/} See Towards Full Employment, a programme for Colombia, prepared by an International Mission, organized by the International Labour Office, International Labour Office, Geneva, 1970, para. 450.

^{20/} See ECLA, The Progress of Industrial Development in Latin America, op.cit. page 74.

employment opportunities directly for more than a very small fraction of the labour force and even that gain may be partly, wholly or more than wholly offset by backwash effects".^{21/}

If any conclusion could be drawn from the analysis so far presented, it is simply that technological innovations brought about by the chosen path and pace at industrialization processes in developing countries have so far not been able to satisfy the employment requirements of these countries.

One can add also that probably the scope of using substantially more labour-intensive technologies in manufacturing is not wide, and is more limited than in other sectors, such as agriculture and construction, where the impact on employment of any specific capital-substituting technology is generally likely to be significant. Some fragmentary evidence would seem to support this contention. Even if technological rigidities in manufacturing are greater than in agriculture or construction the expansion of the former is believed to lead to an increased employment in the two latter sectors.

While social pressure may force governments of developing countries to consider adopting labour-intensive technologies, it may well be asked whether the overall application of such technologies would in fact make any significant differences in the employment impact of industrial expansion. From a study of selected modernised Indian industries where capital/labour coefficients were calculated for cement, paper, iron and steel, sugar and cotton textiles, it has been concluded that "Even doubling the labour per unit of investment, as compared with the coefficients computed would only increase the labour force in the five industries studied by about 100,000 more workers than projected in the Second Plan, assuming the same investment plans; the effect upon all organised manufacturing industry would increase employment in all factory manufacturing industries by less than one million workers in the Second Plan period (in contrast to a projected expansion in the

^{21/} Gunnar Myrdal, ASIAN DYNAMICS, page 1183.

labour force by ten million workers). Investment in this sector has today probably one of the lowest direct employment-expansion effects, compared with an equal investment within other sectors of the economy".^{22/}

Drawing on this analysis, Gunnar Myrdal has observed that "the adoption even on a major - and totally impracticable - scale of technologies and techniques favouring heavier employment of labour would not have made a substantial change in the direct impact of industrial expansion of participating ratios. This is because modern industry forms - and will form for a long time to come - a very small part of the total economy in India and a still smaller one in the other countries of the region".^{23/}

There is little empirical evidence (in physical units) which could be used to demonstrate a comparative level of labour productivity (output per man/hour) in specific manufacturing processes in developing and in industrialized countries. International comparisons of productivity levels are therefore based on the value of output (measured in US dollars) per person employed. Such a broad measure of labour productivity is susceptible to many influences (different number of working hours per man/year, composition of output etc.) and is greatly dependent upon the exchange rates chosen. The resultant productivity levels may reflect an over- or under-valuation of the given currency. Notwithstanding the many inherent limitations the recent estimates of the value added per person engaged, in US dollars, offer some insight into labour productivity in manufacturing.^{24/} For all developing countries in 1963 output per person engaged in manufacturing was only about ~~one-sixth~~ that of industrialized countries. These dollar estimates of value added per person engaged would seem to suggest that there were cases of two-digit industries where value added per person engaged reached or even appeared to surpass the respective average recorded for industrialized countries.

^{22/} George Rosen, Industrial Change in India Free Press, Glenoco, Illinois, 1958, pp. 182-183, (quoted after G. Myrdal, op.cit.).

^{23/} Gunnar Myrdal, Asian Drama, page 1184.

^{24/} The Growth of World Industry, Vol. I, General Industrial Statistics, 1953-1964, 1967 edition, United Nations, New York.

An existence of some high labour productivity industries in a few of the developing countries does not contradict an earlier observation that, generally, low productivity prevails there. The point is that the high productivity frequently covers a limited scope of manufacturing and involves a very limited number of manpower. Out of 24 developing countries (excluding Puerto Rico) which can be credited with some high labour productivity manufacturing e.g. such where output per man in two-digit industries was in 1963 at least 75 per cent of the corresponding average for all industrialized countries, in 5 countries such productivity occurred in industrial pursuits involving in each case less than 1,000 persons. These pursuits might well have been represented by single, modern manufacturing plants working perhaps for exports which might have existed concurrently with a large, in terms of employment, but a low productivity manufacturing sector. Limited scope of the high productivity industries in developing countries is reflected by the fact that these industries accounted for 1.1 per cent of the total manufacturing employment and 8.3 per cent of the total manufacturing output of all developing countries in 1963.^{25/}

It may well be emphasized that since the modern sector of manufacturing and particularly its export industries is the most likely to provide a relatively rapid expansion of income and foreign earnings any compromise with the most efficient production processes in this sector of manufacturing may impose a significant brake on general economic development. This does not mean that in manufacturing there is no room for deliberate policy decisions favouring employment objectives over the highest possible labour productivity objectives. It only stresses an earlier point that perhaps the most reasonable approach in reconciling the effects of modern industrial technology with employment promotion in developing countries is offered by a selective choice of modern technology and an appropriate choice of the country's industrial specialisation. This would mean that in programming the

^{25/} See, The Growth of World Industry, Vol. I, 1967 edition, op.cit. It is significant that in none of the larger and industrially advanced developing countries such as Argentina, Mexico, Brazil or India, the high productivity industries absorbed any sizable part of manufacturing labour.

industrialisation process account should be taken of the fact that there are some industries with great potential for growth where technology normally used has relatively high labour content; (many lines of production within ISIC 35-38 i.e. some metal and electrical products, some transportation products, electronic components etc., would seem to offer such prospects).^{26/} Selection of such industries may help to offset the low employment effect of other industries based on utilisation of local natural resources which might be favourably developed especially for the export of manufactured goods.

III. FISCAL POLICY MEASURES FOR EMPLOYMENT PROMOTION AND TECHNOLOGICAL CHANGES IN MANUFACTURING

This paper has so far discussed some aspects of the application of modern industrial technology and the broad employment effects of these technological innovations in developing countries. It has also touched on some of the issues involved in the choice of appropriate technologies for the industrial sector. It is evident from the preceding analysis that one of the outstanding features of industrialisation in developing countries is the failure to create directly sufficient employment opportunities. For countries whose employment problem is an overriding concern - and this concern seems to be shared by nearly all industrialising countries - this fact has far-reaching consequences. This section of the paper will attempt to outline some of the fiscal policy measures that may be considered in the effort to reconcile the potential benefits of applying the modern technology in industrial development on the one hand, and its adverse effects on manpower absorption on the other.

Of all the policy instruments that may be relevant in this context, monetary and fiscal policy instruments may appear as most convenient to administer in the mixed economies. The use of these measures however does not preclude the usefulness of other policy measures such as investment licensing

^{26/} The labour-intensive manufactures would seem to include also some capital goods like textile machinery. See, Hal B. Lary, Imports of Manufactures from Less Developed Countries, N.B.E.R., New York 1955, Table 2, page 24.

or other administrative measures. One can also add that the choice of specific policy measures should be evolved in the light of industry's performance in employment and productivity in the past and should aim at meeting some employment and productivity targets in manufacturing.^{27'}

There is significant differences in scope for and objectives of fiscal policy in developed market economies and developing countries. Full discussion of these differences falls beyond the terms of reference of this paper but may suffice it to say that in the latter countries the scope for fiscal policy measures is smaller and effectiveness of fiscal measures is rather lower than in developed market economies, particularly in the area of employment creation and stimulation of technological change. This seems to be a fundamental factor in considering the various technical measures of fiscal policy in developing countries.

Industrialized countries tend to be concerned about the competitive power of their industrial sector and its effect on the balance of trade; promotion of the improvements in technologies is frequently looked at as means of aiding economic growth; governments appear also concerned if industry is not investing on a sufficient scale to modernise their plant and equipment. In countries where conditions approaching the full employment seem to prevail, there appears to be a tendency to consider employment as an objective of their policy mainly in measures designed to promote the location of new industries in backward or depressed areas of the country.

There are many fiscal measures used in developed market economies to promote capital investment and to encourage an early replacement of machinery and equipment with one representing a more modern technology. Some governments have permitted accelerated depreciation of certain forms of new investments;

^{KU} Though employment may be an overriding concern of developing countries, it is significant that only in a few industrial development plans of developing countries the employment or labour productivity targets are explicitly formulated and/or reported. See UNIDO, Summaries of the Industrial Development Plans of Thirty Countries, United Nations publication, op.cit.

some have introduced investment allowances which permit the writing off of an additional proportion of the cost (say 20 per cent) when the investment is made; some have used investment grants, a cash grant (sometimes as much as 25 per cent) towards the cost of new plant and machinery. Some countries use a tax on employment itself (e.g. the selective employment tax in the United Kingdom) as a means of promoting a better use and allocation of a relatively scarce factor.

Many developing countries have resorted to many of these fiscal incentives in their drive to provide the most competitive terms for foreign investment. If promotion of the maximum employment is intended to be an overriding policy objective, one can ask how application of all these measures have influenced the potentially possible level of manufacturing employment in developing countries? To the extent that these countries have, (a) allowed for high rates of depreciation for tax purposes; (b) maintained provision for accelerated depreciation; (c) granted investment allowances and investment grants irrespective of the size of employment generated by investment provided through such measures they might appear to inadvertently encourage the use of capital-intensive technologies and thus reduce a potential for new employment. Similar comment could be directed at the indiscriminate use of a tax holiday which reduces or exempts profits from taxation in the early years of operation of a new manufacturing plant. If such a tax holiday is granted irrespective of the size of newly created employment, it is doubtful whether it is beneficial to the promotion of manufacturing employment. If it is decided that fiscal policy should be used to promote expansion of employment and the use of labour-intensive technologies, there appears to be scope for many developing countries to rethink the objective of their tax incentive programmes.^{28/}

^{28/} Such an exercise would seem particularly relevant in view of the fact that tax benefits are found to have limited effectiveness in inducing new investment. See Georg G. Lent, Tax Incentives in Developing Countries, Revista Di Diritto Finanziario E Scienze Delle Finanze, Anno XXIX, N.I, Marzo 1970.

If promoting labour-intensive lines of production is a major objective, the industries selected for these benefits and criteria for deciding the generosity of incentives should both be linked more closely to the employment effects of new industrial projects. The effectiveness of using such new criteria in promotion projects which would not otherwise have been established will depend on the extent to which incentives benefits are also offered to projects selected on the basis of other criteria.

In some developing countries tax incentives are applied on a selective basis; they promote investment in only some of the newly established industries. These incentives can perhaps help promote employment if they promote the establishment of labour-intensive projects which would not otherwise have been established. Employment is sometimes one of several factors included in a list of criteria for the selection of industrial projects benefitting from such tax incentives and value added generated in the manufacturing is used as a criteria for granting tax incentives; this probably leads towards favouring labour-intensive technologies. Promotion of the labour-intensive technology is however likely to be more effective if the employment effects (number of workers employed) are the direct criteria in the selection of projects benefitting from incentive measures.

If developing countries wish to expand employment in industry by promoting the use of labour-intensive techniques, a possible policy would be to redesign all forms of taxation and levies based on the size of labour force of an employer which appears to increase the cost of labour and instead raise the revenue in different fashion from within manufacturing or from other sources of budget revenue. This would be a major new direction for fiscal policy to take and one which warrants careful investigation.

Many developing countries offer tax incentives to promote export-oriented industries regardless of the technology chosen. The promotion of export-oriented, labour-intensive industries is probably the most important policy area to be considered though one should bear in mind that such measures do not diminish the levels of competitiveness of export industries.

In the case of existing industries the government may consider the application of fiscal incentives to encourage the use of multiple labour shifts working the same machines. It is sometimes argued that it might be possible to significantly increase labour employment working a given quantity of fixed capital if the transition is made between one shift which is poorly managed and two or three shifts where the production process is well managed, with incentives and intensive staffing.^{29/} Recently, less overt optimism in the assessment of effects of maximum-shift work seems to emerge. An optimum pattern of shift work combining the technical, economic and social consideration is advocated.^{30/} The present pattern of shift work in developing countries seems to be far away from an optimum level.

In this connexion, it may be observed that there is often scope for using additional labour to give machinery more careful service and repair than is indicated as being necessary in manuals supplied by engineers in developed countries.

Fiscal incentives may also be considered to induce industries to differentiate between the so-called core operations and their ancillary or auxiliary operations. While core operations may be inflexible, in their fixed capital-labour ratio, the ancillary operations, once separated, could be more labour-intensive. Examples of these operations may include handling of

^{29/} Morris J. Solomon, Better Plant Utilization in India - A Blueprint for Action, Asia Publishing House, Calcutta, 1963.

^{30/} N. Kabaj, Shift Work and Employment Expansion, International Labour Review, Vol. 91, No. 1, 1965 and Shift Work and Employment Expansion Towards an Optimum Pattern, International Labour Review, Vol. 98, No. 3, 1968.

materials, warehousing, packaging, maintenance and inplant transportation.^{31/}
The various fiscal policy measures mentioned above do not cover all aspects of employment promotion under industrialization and technological changes. Their brief presentation was rather meant to illustrate some tentative possibilities open to policy-makers. Before concluding such a review, two general issues of industrial employment promotion deserve a special mention. One is related to the utilization of local inputs in industry and another one pertains to crafts, cottage industry and artisan employment.

Regarding the former issue one may note that the growth of manufacturing provides a potential for an increase of employment in other sectors. Through industry's demand for raw materials, intermediate products and specific services, the expansion of manufacturing industry contributes to an increased demand for new labour in the supplying sectors. Similar effects bring in an increased demand for food and services by the manufacturing labour. Any fiscal measures encouraging the greater utilization of local inputs are therefore conducive to the implementation of the overall objective of employment promotion. It is sometimes believed that the potential for the indirect employment effects generated by the manufacturing may be as great as the direct one occurring in industry itself.

^{31/} A specific step that may be used to give effect to the process of shifting emphasis from capital-intensive to labour-intensive processes in a given line of processing is offered by the industrial licensing of investment. By the use of this instrument, the government is able to control the types of industries and technology to be newly established or expanded within the economy. This control mechanism could be used to deliberately discriminate against excessively capital-intensive processes in selected industries and/or in favouring those that are more labour-intensive. Through this system of investment licensing, a specific policy can discourage or phase the use of excessively capital-intensive machinery in certain defined industries where the wide use of alternative processes of production is considered to exist. In the application of these measures the government should be extremely selective and be aware of those industries which, by their very nature, require particular types of technology and specific production techniques for their efficient operations or which stimulate technological improvements and promote efficiency in other industries.

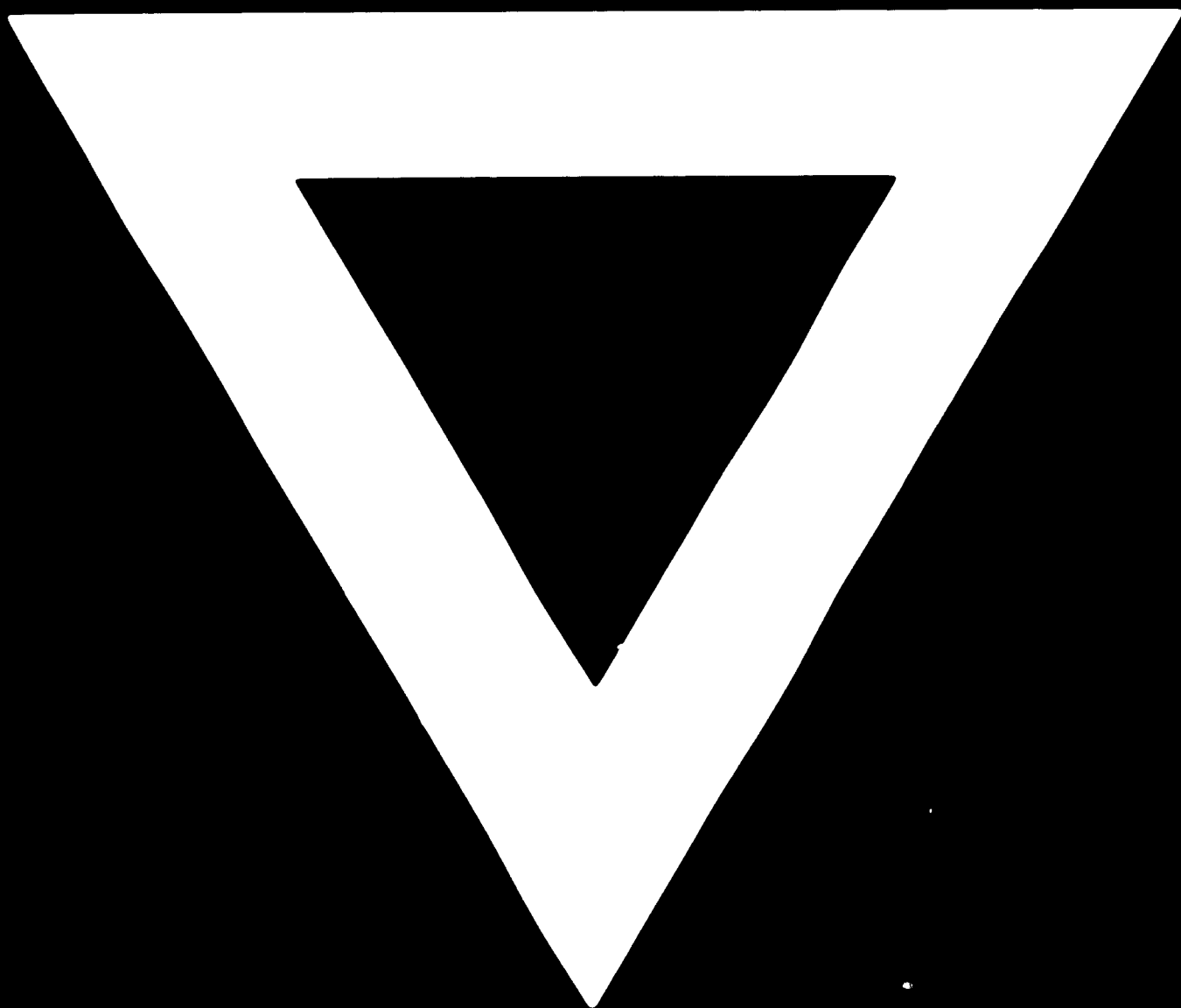
Though the growth of industry may lead to some displacement of artisan labour the crafts and related trades are not fully substitutable by industry. Whenever economically justified by existence of markets for their products and availability of local raw materials, the artisan sector of manufacturing should be rationalized and modernized. One has to reckon that probably for a long time to come, the artisan sector of manufacturing in developing countries will continue to absorb a sizable portion of labour force.

In the modernization of craft and traditional small-scale industries, many fiscal and other measures can be taken to assist them. They might be in the form of:

- (a) Cash grants to purchase machinery;
- (b) Subsidised establishment of factory buildings (industrial estates);
- (c) Subsidised or low interest loans for investment;
- (d) Provision of advisory and extension services paid for by the government (including assistance in bulk purchases of raw material, organisation and financing of advertising campaigns promoting craft and artisan products, assistance in organisation of sales and subcontracting with modern industry, etc.).

Whatever policy measures that a government may adopt to promote labour-intensive processes of manufacturing production, one point should be borne in mind. The fact that most of the under-utilized labour in developing countries is unskilled and does not easily render itself to industrial work even if labour-intensive process of production is chosen. Training of such labour is necessary before greater use of their services could be made. Since from the employment objective point of view, the use of this labour is very desirable, the government should adopt measures that will promote extensive training of the industrial labour force. While much of the basic training should be undertaken by the government itself, encouragement should be given to manufacturing enterprises to undertake in-plant and other training programmes for their own labour force. Such encouragement could take the form of outright subsidy to the cost of training to the specific establishments and industries conducting training. Revenue for such programmes could be collected through a special levy covering all manufacturing establishments.





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