

The Significant Variables of Full Employment and their Explanatory Values

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I. EMPLOYMENT AND OUTPUT

Technology in the nineteenth century was designed according to the prevailing resource endowment and was labour intensive as industrialised countries in the 19th century invented their own technology as their resource endowment demanded—capital had to be found from personal savings of the investors—which acted as a check on development of technologies making high demand on capital. In such an economic environment there was a direct and positive linkage between output and employment. Employment being thus a linear function of output, the employment optimisation path coincided with the output optimisation path. Not so now. The latecomers in the industrial field in the twentieth century have to select from the available capital-intensive technologies designed for a labour saving mode of production. A conflict between output and employment thus arose because of (1) the labour-intensive technologies higher capital input and higher price per unit of output arising out of the limited scale of production, as against the capital-intensive technologies, lower capital input and lower price per unit of output arising out of larger scale of economy. The resulting trade-off between output and employment involves a more complex question of the weightage to be given to current as against future output compared with the weightage to be given to current as against future employment. Optimum welfare would therefore result from maximising current output and employment by maximising the present value of the entire streams of output and employment over time.

II. RELATIONSHIP BETWEEN INCOME AND EMPLOYMENT

There is a two-way relationship between employment and income distribution. The level of employment being the main vehicle of productive distribution of income as it redistributes income in favour of workers and peasants employed on

wages in factories and farms. Conversely, the income distributed i.e. from the rich to the poor would affect the level of employment in so far that the income transferred from the rich to the poor either through increased wage transfer or through fiscal measures or otherwise will be used differently from the way in which it would have been used if it had remained in the hands of the rich. The propensity to consume of the poor being high particularly in respect of the locally produced goods produced through labour intensive methods—the level of consumption of these goods is bound to rise giving a fillip to an increase in employment.

III. EMPLOYMENT AND TECHNOLOGY

Generally technical progress results in higher output through increased productivity of labour and consequently the rate of growth of employment lags behind the rate of growth of output. If the technological progress is disembodied affecting the existing as well as new capital equipment and therefore unrelated to the rate of investment and if it increases the labour productivity associated with techniques varying capital intensity to the same extent then the technique which maximises the rate of growth of output will be the same as the technique which maximises the rate of growth of employment although the percentage increase in output would be larger than the increase in employment. Employment would continue to have a direct and positive linkage with output. But the reverse would follow if the technical progress is embodied.

Similarly if the price elasticity of the demand for the product produced under a more advanced and capital-intensive technology is more than the increase in the labour productivity the employment effect of such technology will be positive and vice versa.

In case of a fixed technological coefficient of production function, there is no choice of technology available whatever the relative factor prices. It is only where the production function permits a variation in factor proportions namely labour and capital – that the question of influencing the choice of technology through fiscal and monetary policy arises. There are certain plants that can be worked by a given number of workers—the scope of increasing employment—through extra shifts and overtime is very limited. In such a situation the choice does not lie in the field of technology, but a choice would still be available in the matter of product mix—especially if the product in question is an item of conspicuous consumption and can be easily substituted.

In case where the production function of the product in question permits variation in factor proportions—three types of problems would still arise in adopting

employment-oriented technologies (1) distorted factor prices (2) distorted factor proportions and (3) Inappropriate technology. There exists some natural or undistorted set of factor prices, wage rates, interest rates etc. which would reflect the opportunity cost and theoretically, bring about full employment of that factor at that natural price. This is subject to an assumption that wages paid may be freely varied without affecting labour efficiency necessary for its working. The labour force whatever its opportunity cost has to be well fed, healthy, punctual and otherwise physically fit to handle plant or machinery. The so-called undistorted wage rates are often well below the level necessary to handle modern technology. The wage rate is not only an element of cost but also an element of productivity. The rapid technological changes have created a state of flux involving all the dynamic economies of the world. Activities of one sort or another disappearing while opportunities for others are continuously arising causing continuous movement of labour from one kind of activity to another even in fully employed economies. Cyclical or demand deficient unemployment is a consequence of the aggregate demand for goods and services falling temporarily short of the capacity of the economy to supply them.

Structural unemployment arises when the capacity of the economy to supply the goods and services demanded at a given pattern of relative prices is constrained by the non-availability of certain inputs, like skilled labour and capital output.

The production process depending on low cost energy for its profitability, became uneconomic when energy prices increased. The emergence of the newly industrialised countries in the Asian Pacific region competing with the industrialised countries in low cost, labour-intensive manufactures, application of computer controlled techniques, automated assembly lines and increasing use of robotics led to the substitution of the machine for man in labour-intensive industries depth and extent of recession has further accentuated this structural as well as demand deficient unemployment since 1974.

IV. EMPLOYMENT AND SERVICE SECTOR

As income level rises a higher proportion of the consumption expenditure is diverted to services—expenditure toward luxuries, recreation, dining in restaurants, foreign travel, music, fine arts, etc. etc. Services as a result of modern technology and the mass consumption society are expanding rapidly in advanced countries and have begun to expand in the developing countries. The old traditional pattern of services that prevailed in the absence of the hardware of modern civilisation associated with the wealthy elite at the top and the illiterate men below is on its way out. As a result of the growth of industry, the emergence of modern cities, fast

expanding health, housing, education and other developmental activities the services sector is rapidly growing. The demand for services is increasing more than proportionally to the increase in the value of the services, the labour, productivity in the services sector being slower than the increase in the demand for it.

However, in the transport and construction sector the labour productivity has increased much faster than the growth in the demand.

Also with the rapid growth in the production of service providing goods, like, musical instruments, washing machines, vacuum cleaners, TVs, VCRs, self-operating medical instruments etc.etc., the growth in labour productivity has outstripped the growth in demand for these services.

In the industrially advanced countries like the USA, Canada, Europe the service sector accounts for 60 to 70 percent of total employment. Increasingly large percentage of increase in employment is taking place in the services sector in the under developed countries as well particularly in the fields of administration, finance and trade.

V. THE CAPITAL INTENSITY, SIZE OF PRODUCTION UNITS AND EMPLOYMENT

Gerald Meir in his leading issues in Economic Development while dealing with employment limitations under condition of diminishing marginal productivity of labour refers to the existence of considerable empirical evidence that in many industries and in many processes the more labour-intensive methods are also capital saving per unit of output. In such cases maximising output and employment can proceed hand in hand. Such output and employment maximisation can be particularly achieved by devoting more of Research and Development efforts to labour-intensive methods of production. At present, he points out, all research and development efforts are concentrated on producing labour-saving methods of production suitable for the developed world where labour is scarce. As Kaldor points out. "The labour intensive method of production currently available are generally the products of earlier and less sophisticated science and technology".

Sen suggests that in cotton weaving the capital-output ratio is the lowest for the most labour-intensive techniques, the fly shuttle handloom and highest nearly 2-1/2 times as big for the automatic power loom. Evidence exists for a range of efficient techniques in a number of industries below a certain critical level of output. A study by the OECD on Economic Growth and Structural Changes (1985) brings to light that during the 1970s employment growth shifted from large enterprises to small firms. In the U.S. over 1969-76 two-thirds of all jobs were created by businesses

with fewer than 20 employees and over 80 percent by firms employing under 100 employees and between them they accounted for 40 percent of the employed labour force in 1977. The study finds that the centuries old tradition of industrial expansion taking place through the reduction in the number of small firms appears to have been reversed in a period of slow growth. During the period of technological flux, due to structural changes, deep and persistent recession, the small and medium-sized enterprises find themselves equipped with greater dynamism and innovative capacity and are highly job creative while large enterprises are faced with the problems of reorganisation and integration, and in order to stay competitive they have to modify their personnel management strategy, rationalise their production method, sub-contract or decentralise certain options and finally reduce their staff. In all member countries the small and medium-sized enterprises account for a larger share of value-added to investment and employment. Around mid 1970s the majority of workers (40–75 percent) worked for firms with less than 50 employee. In certain industries namely textiles, wood products, plastic products, food etc.—the percentage of the workers employed in this category (employing less than 50) was as high as 60–70 percent. Small-scale enterprise, according to the definition adopted by the Indian Planning Commission varies from persons employed 50 to 10. In India the upper limit is 50 for mechanised and 10 persons for household nonmechanised. In the Third Five-Year Plan for India the following conclusions were drawn from the accumulated experiences “Where individual small-scale industries including village industries have failed to adopt improved technique, or to achieve economies of scale or to organise themselves into cooperatives, production costs have remained high. They have also remained faced with the problems of unsold stocks and decline in production and employment. Hence the Plan recommended “..... to improve the productivity of the workers and reduce production cost by positive assistance such as improvement of skill, supply of technical advice, better equipment and credit etc”. The Plan also concluded that “For many years the greatest scope for utilising man power resources in rural areas will lie in agricultural development programme and in project for road development, village housing and the provision of rural ‘amenities’”.

VI. RESEARCH AND DEVELOPMENT AS AN AGENT OF GROWTH AND EMPLOYMENT

Man has limited knowledge of matter and motion and even more limited knowledge of life and therefore, his capacity to harness matter and motion in the service of human life is equally limited. It is only by increasing his knowledge about

matter and motion that he can enhance his ability to generate more resources. The generation of additional resources is, therefore mainly the function of knowledge and the capabilities that it confers upon man. It would be taking too narrow a view of technology if it is restricted to capital goods mainly consisting of structures and equipments. Technology comprises all that enhance man's ability to work, manage and organise.

Research has come to occupy a critically important place in the process of economic growth and full employment. Vernon Ruttan has argued for massive investment in research efforts particularly in the field of agriculture on the following grounds:

1. It permits the substitution of knowledge for resources;
2. it facilitates the substitution of less expensive and more abundant resources, for more expensive and increasingly scarce resources; and
3. it releases the constraint of growth imposed by inelasticity of resource supply.

Modern agriculture, says Ruttan, is science-based rather than resource-based industry. The underdeveloped countries characterised by low productivity can get over low productivity and scarcity of resources by substituting knowledge for the scarce resources. Advances in science and technology much more than the material resources hold the key to achieve more productivity and an improved relationship with the natural world. It is by making advances in education and research that underdeveloped countries with poor natural endowment, low capital formation and a high growth rate of population can break through the vicious circle of "being poor because they are poor". Advances in knowledge and technology have not only expanded the size of spaceship earth but are pregnant with possibilities of progress and prosperity hitherto unknown to past civilisations. The material resources like fertile land, iron and steel, coal, oil etc. can all be substituted by human resources. The Research and Development package in order to achieve the optimum development and utilisation of human resources must be so designed as to be consistent with the nations resource and cultural endowment. Experiences in economic development confirm that there is no fixed path to the technical change required for economic growth and full employment. The constraints imposed on agricultural development by the inelastic supply of land in economies like Taiwan, Japan and Korea have been offset by the development of high-yielding crop varieties substituting chemical and biological inputs for land. In Denmark a labour-intensive integrated livestock technology triggered off high rates of productivity growth such

as could not be attained by her neighbours more favourable endowed.

The constraint by the inelastic supply of labour in countries like the United States, Canada and Australia have been offset by technical advances through research and development facilitating the substitution of mechanical power for labour. The transfer of high productivity technologies from the industrial countries of the West are beset with the problems of their adoption to the local conditions in the underdeveloped countries. These high productivity technologies cannot be transplanted immediately. The successful transfer would depend upon the research and development capacity of the importing countries to develop location-specific biological and mechanical technology responsive enough to the physical and economical environment of the labour surplus low productivity underdeveloped countries and region. Most of the technologies in the industrial countries of the West have been designed to be labour saving which do not answer the requirements of the labour abundant, low productivity economics of the underdeveloped countries. There is, therefore, the pressing need for embarking upon a massive research and development programme for developing productive technologies suited to the local conditions and needs. This involves the knowledge of science and technology developed in the industrial West and at the same time the local capacity to evolve with the help of this advance knowledge suitable productive package of technologies, responsive to the physical and economic environment of the labour abundant, low productivity countries and regions. This brings home the fact that the answer lies in innovation and adoption and not in limitation and transplantation of these advanced technologies.

Economic theories until recently looked upon innovation, namely breaking of new grounds in knowledge and developing new techniques of production as exogenous to the theory of economic growth. These were, according to this approach, wind-falls or unusual development which took place only once in a century or which was *manna* from heaven. Technological changes and innovation have now been institutionalised in the form of a continuous on-going research programme. In recent decades massive investment has been made in the promotion of research. Continuous research and innovations, therefore, qualifies in important ways for heavy and massive investments. The Green Revolution in agriculture was the result of a breakthrough in biological technology in the form of high-yielding variety of seeds and the application of chemical fertiliser in proper doses. The development of this biological technology had its impact in India and Pakistan in the growth of output and employment. It has been estimated that in the United States of America massive investments are being made in research projects aimed at developing new

processes of the existing products, designing new products and improving existing products. Japan, which took off from a very narrow physical resource base, attributes its phenomenal economic growth almost entirely to its rapid strides in the field of education and research-based technology.

It is, thus by the required investment in research and development that it would be possible to generate a continuous flow of appropriate technologies to enhance the productivity of the developing economics.

Agriculture in under-developed countries holds the key to economic growth and progress. It is the main source of output, employment and foreign exchange earnings. Conventional agriculture practices have to be modernised through technological changes that are appropriate to the local needs and situation. Large scale mechanisation of agriculture is neither feasible nor desirable. Even a country like Japan with small peasant holdings did not go for mechanisation on a massive scale and yet it brought about the green revolution through research and development in the form of high-yielding variety seeds in conjunction with the adequate application of chemical fertilisers. The breakthrough in Japanese agriculture was brought about by research in agriculture and by training the manpower in the effective application of appropriate technology. Manpower development by enhancing knowledge and skill is of crucial importance in the case of underdeveloped countries. The research and development efforts in labour-surplus underdeveloped countries can be devoted to increase the efficiency of the labour-intensive technologies increasing labour input but decreasing the capital input per unit of output.

VII. EDUCATION AS AN INTEGRAL PART OF EMPLOYMENT

Education exerts its influence on employment in three significant ways:

1. The provision of secondary and university education delays the arrival of the youth on the labour market.
2. Expansion of education, particularly at the primary level, creates a rising demand for teachers and complementary staff. According to one estimate about 15 percent of the output of the educational system is absorbed in the education department.
3. Expansion of education in a planned way contributes to the overcoming of the skill shortages and of the lack of the professional workers needed jointly with unskilled or low skilled workers if these are to be provided with productive jobs.

In addition an efficient university education system strengthen the base for research and development the great creator of resources and technologies. Education in fact teaches (1) Life skills (2) Communication skills (3) Productivity skills. Man at no stage of his history has lived only by satisfying his biological need i.e. only by consuming goods. Education by teaching the life skill prepares man to satisfy his cultural, social and spiritual needs. It is only by teaching the productive skill that it prepares man to produce good and services for the satisfaction of his biological needs and the satisfaction of these needs are necessary for his survival—a man must live before he can live well. But he should not live merely for the sake of living.

According to Kaure Ruud “a distinction must be made between educated manpower and skilled manpower. Performance of skill in a certain occupation is something much more than education. Education including pre-service training can only provide a basis for further skill formation in employment. The highest level of skill is usually reached after many years of work practice. In many occupations education and subsequent work practice is not enough—the skill must be developed systematically through in-service training after the person has entered employment”.

The human capital model developed by Schultz is highly sensitive to the double linkage between education and productivity and between productivity and wages. These linkages, particularly in underdeveloped countries, are weak and unstable and to that extent the model's application is circumscribed by the prevailing conditions of the underdeveloped countries. However, the rate of returns worked out within the analytical framework of this model send out reliable signals about the state of education in the under-developed countries. The human capital model developed by Schultz provides not only the guiding principles of investment in education, research, training but also serves as an empirical basis for quantifying the rate of return to investment in education.

VIII. CONCLUSIONS

There is scope for further exploration in the field of income and employment model building by extending the range of variables beyond what has been hitherto investigated in the received models.

It seems feasible, thereby, not only to postpone but also to fend off what appears to be an inbuilt trade off between the optimisation of output and the optimisation of employment.

That would indeed be a great break through with for reaching policy implications and with a very high welfare content.

Comment on
“The Significant Variables of Full Employment and
their Explanatory Values”

The paper “The Significant Variables of Full Employment and their Explanatory Values” by Israrul Haque touches upon a few fundamental issues involved in the regime of employment. I agree with him that “Employment” need not be construed merely as a linear function of the level of output and investment. “It is the interaction among a number of factors that determine the level of employment”. Various approaches developed under the classical theory or the Keynesian system do have certain merits but they also suffer from certain serious shortcomings as well. This makes the whole exercise look for some new and innovative ways to comprehend the phenomenon of employment. According to the author, new approaches were developed during the mid 1970s to deal with the issue under discussion. Meanwhile the whole employment scenario has become quite different. It has been the ‘structural fault’ in the system which loomed large over the whole employment front. This related to technological innovations, high energy prices, competition from newly emerging industrial countries and the situation of real wages outstripping labour productivity etc. The monetarists too had their approaches to deal with employment. But here again the overall environment conducive for the promotion of employment cannot alone rely on the monetarists’ theory of economic growth. Government intervention too has not proved to be an effective instrument in this respect because inflationary spending has also its serious limitations.

The paper touches upon quite a few interesting points, among them, employment and technology; employment and service sector; international trade and employment; capital intensity and size of production units and employment; research and development as an agent of growth and employment; population and employment education as an integral part of employment; training system as an agent of employment; migration flows as a component part of employment. While dealing with all these issues, the author comes out with the thesis that the macro phenomena of employment cannot be understood within the narrow range of selected theoretical concepts. The issue of employment has meanwhile become more complicated with the emergence of new technologies and the concomitant

greater integration at the international level. It is this new dimension found in the international economic set-up which has made the employment thrust no more confined to national boundaries but to go far beyond that. The author is right when he says: "Structural unemployment arises when the capacity of the economy to supply goods and services demanded at a given pattern of relative prices is constrained by the non-availability of certain inputs, like skilled labour and capital output". Such a situation cannot be resolved merely by resort to certain national policy adjustments. There may emerge the need to develop local skills with foreign co-operation. Another problem that may also arise could be the existence of unemployment insurance, which may stand in the way of acquiring the desired skills.

While dealing with employment, the author also underlines the role of the multinationals. In his view: "The multinational corporations accounted for one-fifth of the world's output in 1985. ... These multinationals can transfer technology, capital and managerial skills from one country to another in response to the difference in comparative cost and thereby optimise the benefits arising from relative comparative costs. "This globalisation on the economic front obviously adds another important factor both hindering and fostering employment in certain countries.

I agree with the author that the traditional labour-intensive industries like textiles and electronics are also moving away from the labour-surplus countries. But one must also not forget the fact that quite a large segment of the textile industry, particularly the garments sector, still continues to be the prerogative of the labour-surplus countries.

Floating exchange rates have not blocked the prospects of employment in the developing countries, as the author contends in his paper. On the contrary, this phenomenon has opened up prospects for many a country like Pakistan to integrate itself (for the time being only partially) into the world capital market. Such a change obviously gives an impetus to a greater division of labour and opens up prospects for a beneficial economic exchange of goods at the international level. I agree that one can devise different ways and means to make intensive use of labour in a more economical and efficient manner but this will obviously require greater '*skillisation or knowledgisation*' of the labour. This is nothing new. South Korea and other countries in the East Asian region have been doing this quite successfully during the past thirty years or so.

I agree with the author that the agricultural sector has great potential for development in third world countries. But here the crucial issue is to maintain a proper price level as otherwise the desired mechanisation will fail to take place. In

Pakistan, the lower price level for agricultural commodities is one major factor standing in the way of the needed development in this sector.

Population alone cannot serve the cause of development. Its size also needs to be determined within the parameters of the existing resource endowment and prospects of their proper utilisation.

Migration has an important role in the regime of employment. But its indiscriminate outflow can also prove detrimental to the country of origin. One reason as to why Pakistan has continued to suffer on the development front during the Seventies and Eighties has perhaps been the too liberal migration of Pakistan's skilled/professional manpower to the Middle Eastern countries. As against this thesis, the author seems to be more inclined to attribute promotion of employment to massive emigration when he holds the view that this migration had proved beneficial to both the receiving and the sending countries.

At the end, it may be said that although the author has taken pains to come out with some innovative ideas on the employment front, his approach has not however been an organised one. There are thoughts and counter thoughts, all put together, without however linking them in an integrated manner. This seems to be the biggest weakness found in the paper.

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