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SOME ASPECTS OF ECONOMIC GROWTH IN OVER-POPULATED COUNTRIES*

V. RAJAGOPALAN

Lecturer in Economics
Agricultural College and Research Institute, Coimbatore

Introduction

Economic growth in over-populated countries depends on economic, institutional, and extra-economic milieu; and, therefore, an inter-disciplinary approach to analyse various aspects of growth is necessary. Nevertheless, in what follows, attention will be focussed on economic aspects of growth noting *en passim* the significance of other factors in influencing the behaviour of growth variables. Economic growth implies widening of the range of choices for decisions on various segments of economy (*7*). Over-populous economies are generally but not necessarily less developed. However, by defining over-population in relation to supply of natural resources and productive capital, and by implication high population densities, under-utilization of labour, use of natural resources beyond the point of optimum, and low capital and technological base, over-populated countries are less developed countries; and, therefore, terms such as 'over-populated' and 'less developed' are used interchangeably. To be sure, less developed countries are caught in the vicious circle of low productivity, low capital base, and high population density. Growth implies the process of change in breaking this vicious circle and moving into the orbit of sustained growth and development.

Conceptual problems of economic growth and divergent hypotheses to explain the problems will be discussed in the present paper. Before proceeding further, a brief account of determinants of economic growth in less developed economies seems to be necessary as a background for later discussions.

Determinants of Economic Growth

Growth models are, in the post-Keynesian tradition, aggregative and aggregate production function with assumptions of homogeneity in factors, constant return to scale, and neutral technology is generally the starting point. Without loss of generality, aggregate production function is specified as a function of natural resources, labour, capital, technology, and social and cultural milieu (*1*). Growth of the economy is related to rate of changes in total output to rate of changes in determinants of the production. The magnitude of changes in the determinants depends on initial stocks and size of stimulants for growth.

The problem of aggregation of natural resources of different types, labour of different skills and productivity, and capital of various classes and vintage is complex and generalization of variegated social and cultural patterns within a

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N.B. Figure in bracket denotes to the literature cited under 'References' at the end of the paper.

given country to fit in a general framework of growth is still unresolved even though empirical studies use aggregation and generalization on the basis of simplifying assumptions.

Two related hypotheses on the prospect and magnitude of growth or lack of it deserve mention. First, tradition bound societies do not respond to economic stimuli unless traditions which are bottlenecks for development are subverted or transformed. Second, the objective of profit maximization as a galvanizing force for resource productivity and efficiency is rarely observed in decision in traditional economies. Lack of entrepreneurial initiative is a symptom of it.

Taking the second first, lack of profit maximization motives leads to absence of an entrepreneurial class. Assuming the causal relations on the reverse, one might note that risks and uncertainties seem to be the main bottlenecks for adopting profit maximization as an objective function. With low income, scarce capital, and limited alternative opportunities, the cost of risks coupled with uncertainties assumes a very high magnitude; and this constraints profit maximization objectives. The decision makers prefer to be, in the words of Hicks, stickers rather than snatchers on survival considerations. If this is accepted, the first hypothesis seems to lose much force since response is conditional largely by risk and uncertainties and it is not therefore legitimate to assign the reasons for non-response squarely on traditions and customs. With this in mind one can visualize the role of economic opportunities and capital in stimulating growth. We turn now to the theoretical framework of growth.

Growth Models

Nurkse, Lewis, Leibenstein, Ranis and Fei (*10*, *8*, *6*, *13*) assume that, in less developed economies, the agricultural sector is the largest sector probably employing more than 70 per cent of the population and contributing about half of the national product. The work force in agriculture is more than what is required but is employed in full as "everyone fights to establish a solid claim to a share of the national product" (*4*). It is possible to maintain the total output even after a part of the work force is withdrawn. In terms of marginal productivity calculus, this surplus labour implies, *cateris paribus*, zero marginal productivity of labour (*4*). This condition is termed as disguised unemployment in agriculture which, Nurkse believes, can be utilized in capital works, thus, creating a potential for capital formation. Lewis (*8*) finds opportunity for higher profits under assumption of constant real wages, in the capitalist sector which generates capital formation and new investment. Leibenstein, and Ranis and Fei (*6*, *13*) refine the concept of disguised unemployment further.

Leibenstein (*6*) is careful in identifying the two types of disguised unemployment. First, seasonal unemployment that leads to partial under-employment and changes in volume of this class of work force lead to changes in total output. This type of disguised unemployment is a familiar concept. Second, disguised unemployment occurs when labour potential is not fully used by keeping wages at subsistence level. The crux of this construction rests on the distinction between labour (man-hours) and wage units. At subsistence wage levels labour productivity is minimal because of low energy in-take; and labour productivity increases

when energy level of in-take increases. It follows from the above argument that it is in the interest of employers to increase wages and widen the scope of employment beyond the level determined by marginal equilibrium lest the impact of wages is fritted away by sharing of the consumption basket among unemployed higher labourers. Reduced labour productivity gives rise to disguised unemployment. Real wages paid are institutionally determined and they tend to be higher than subsistence wage levels.

The assumption of competitive milieu and marginal equilibrium does not, it is argued, fit in with the conditions of less developed economies. An alternative hypothesis on disguised unemployment is that all labour is fully used to maximize total production at which positive wage rate exists. This happens to be so at the instance of feudal institutions in less developed economies (*4*). Schultz, however, is critical of the notion of disguised unemployment. He can find no evidence to support the assertion that, under disguised unemployment, reduction in labour force would not reduce total production. One might wonder whether the forces at work to reduce the effective labour force would also have affected the productivity of the remaining workers (*4*). That being so the energy level hypothesis seems to hold still.

One might conclude that positive real wages are paid not on the basis of marginal productivity but on the basis of institutional considerations. Fei (*3*) gives an operational definition of disguised unemployment as a condition when real wages paid exceed marginal productivity of labour. One might also note that discussions are hitherto confined to aggregative models which, by the nature of their construction, are not very useful to explain growth in less developed economies (*12*). Though Lewis (*8*) discusses a two-sector economy much of his attention is on the behaviour of the capitalist sector. Ranis and Fei (*13*) present a very interesting theory of economic growth which recognizes the crucial role of the agricultural sector in economic growth.

The path of development is divided into three phases on the basis of the behaviour of total and average agricultural surplus. Total agricultural surplus is the difference between total output and total consumption in agriculture. Average agricultural surplus is derived from total agricultural surplus. When surplus labour moves out of agriculture, total agricultural surplus increases till marginal productivity of labour becomes positive. This is the first phase. As labour migrates further total agricultural surplus with given level of productivity contracts and affects adversely the terms of trade for non-farm sector. This phase is the scarcity phase which extends to a point, termed as commercialization point, at which marginal productivity equals institutional wages. From this point onwards the allocation process of labour in agriculture and between agriculture and other sectors is guided by marginal equilibrium.

When technology changes, changes in labour productivity shift the production function and eliminate agricultural shortages. This is in consonance with Jorgenson's emphasis on increasing the agricultural productivity (*5*, *9*). The Lewis point at which shortage begins and commercialization point at which disguised unemployment vanishes coincide and the point of coincidence is termed as turning point.

The basic assumptions of the above construction of economic growth are (*a*) constancy of real wages up to the point of commercialization, an assumption nurtured by Nurkse, Lewis, Leibenstein and others and supported by historical evidence; and (*b*) neutral technology which shifts marginal productivity at the same rate everywhere. The discussions that follow will therefore be confined to the above two assumptions.

Constancy of Real Wages

The first assumption of constancy of real wages is due to the existence of disguised unemployment and competition in the factor market. It also implies, in the context of growth, that changes in real wages affect the rate of profit and capital formation and, therefore, not desirable. Nevertheless, increase in real wages increases productivity and shortens the shortage phase and brings the point of commercialization earlier. Increase in productivity follows better nutrition and living standards and investment in human factor through education and training.

Moreover, it must be recognized that saving and capital formation are essentially determined not only by profit share of national output but also by wage share. Though there are differential rates of propensities to consume and save for these two classes, wage increases are likely to narrow down the difference. In less developed economies wage earners succumb to demonstration effect once the subsistence level is passed. In fact, the early occurrence of commercialization phase as a result of wage increase and widening of product markets through demonstration effect and shift in aggregate demand is likely to lead to economies of scale in production. It might be objected that rising real wages would spark the population growth which augments the disguised unemployment in agriculture. The crucial lag in population and technology should be recognized using the construction by Adelman (*1*), the rate of growth may be specified as

$$z = -\delta l + \beta q$$

where z is the percentage rate of output per man, q is the percentage rate of growth of capital-labour ratio, and l is the relative rate of growth of labour, β is the parameter of capital-output ratio while δ is the scale parameter.

With constant return to scale ($\delta = 0$) assumed, the growth of output depends on capital-labour ratio. As population increases, *ceteris paribus* capital-labour ratio decreases and so is the growth of output. For cases of increasing returns, the growth rate hits 'platinum age' and the effect of diminishing returns is the reverse (*1*).

Relaxing the *ceteris paribus* assumption and assuming 'technical dynamism' it is plausible that the form of capital might also change. Natural resources, for example, might be transformed into a better form through innovations. This would, coupled with higher labour productivity, lead to higher output growth. The present argument rests, of course, on the differential rates of the factors of capital-labour ratio, depending on technology to which we will turn.

Non-neutral Technologies

Technology is effective only when combined with capital and shortage of capital sterilizes the impact of technology on economic growth. Conceptually, technology is a function of public investment either by the State or statutory commodity boards in education and research in most of the less developed economies. The fund of technology is, for a given point of time, more than what is drawn from it because of limited capital and also, for fear of rapid rate of obsolescence which creates factor unemployment in some cases.

Along the growth locus, technology introduces factor substitution to ensure optimum production and resource efficiency. However, lack of adequate capital constrains the process of substitution. More specifically, one might note that capital deepening technology introduced to rationalize labour use does not provide for sustained growth; and, therefore, it seems that labour intensive technologies are necessary in over-populated economies. Lift irrigation by electric motors and pump-sets, change of crop patterns with new crop varieties are cases in points. These reduce redundance of labour, provide more income which, in turn, builds aggregate demand and causes widening of product markets. These become extremely important when less developed economies are caught in a credit trap and capital rationing. Upto the point of commercialization capital substitution for labour needs to proceed cautiously and once this point is hit and agricultural surplus vanishes capital deepening is required and innovations for labour-saving turn out to be a necessary adjunct for economic growth.

One may examine the results of an intensive study on Supply Response for Irrigated Crops in Madras State, India (*11*) for possible clues for economic growth and experiences of different regions in Madras State. A word of caution may perhaps be in order. The study had a major object of aggregate supply function for selected irrigated crops and the discussions here are, therefore, only the by-product of the study. More firm conclusions are possible only through specific studies designed to test the hypotheses for economic growth.

Of the three regions delineated for the study, the first region is surplus in rice, and major sources of irrigation are canals and tanks. The second region is noted for cotton and millets under irrigation by wells. The third region too has cotton and millets but irrigation is mainly by rain-fed tanks. Industrial development is, qualitatively put, high in the second region, medium in the first region and low in the third region. Risks and uncertainties in crop production are high in the third region and low in the first and second regions.

Supply response is, in general, very high in the second region, low in the first region and negligible in the third region. When reasons for differential response among regions are examined, one finds that the second region has small labour surplus and disguised unemployment is reduced considerably by high industrial development. Labour intensive investments on rural electrification and power lifts in irrigation were followed by high real wages and labour productivity. Moreover, favourable terms of trade, in the absence of a shortage phase, for industries enabled out-farm migration and resulted in the introduction of labour-saving technology such as power driven implements and machinery.

In the first region economic incentives such as prices were absent for most of the period studied. There were statutory price controls and compulsory procurement of rice—the staple cereal of this region. Significant response for sugarcane and increasing trend in sugarcane acreage indicate partly the process of crop substitution. Increased sugarcane acreage and development of Neiveli industrial complex are likely to provide economic stimulants for the economic growth of the region. The former is labour intensive while the latter is mainly capital intensive. One might also suspect the existence of considerable disguised unemployment. The third region was plagued by risks and uncertainties and response was poor. There were, however, "islands" of growth in this region. These islands had industries which were labour intensive. The labour surplus appeared to be less and real wages were higher than in other areas of the region. Another notable feature was that uncertainties were minimal as irrigation was through wells. On the whole this region lacks industrial development.

From what has been said one can detect the crucial significance of disguised unemployment, rising real wages and capital-labour substitution through technological developments. The impact of risks and uncertainties on the behaviour of the agricultural sector can hardly be over-emphasized. It follows that theoretical constructs of economic growth in over-populated economies should explicitly specify and include parameters of risks and uncertainties and non-neutral technology.

A word about socio-cultural milieu. One redeeming feature of the Ranis and Fei growth model is the assumption, albeit implicit, that is, of technical dynamism, socio-cultural barriers are not real bottlenecks for growth and aspiration for growth and development is pervasive. The social structure and cultural patterns happen to be fertile grounds for intensive enquiry and intellectual speculations. Limited wants bordering asceticism, limiting feudal institutions and family structure are held as causes of a stagnant society and low income equilibrium. While the force of these arguments cannot be denied one should not lose sight of reverse causal relations, how little the intensity of relations might be. One need not wait for stages of transformation to parade in sequence. Depending on the nature of contact with other societies, the strength of political institutions, and economic opportunities and aspirations soar high. The relation between socio-cultural milieu and economic stimulants for economic growth is, therefore, essentially a two-way relationship. This brings home the point that lack of economic opportunities and risks and uncertainties around social and economic institutions are real bottlenecks for economic growth.

In sum, disguised unemployment in over-populated economies responds to stimulants of economic growth by providing cheap labour at constant real wages for non-farm sectors (*1, 6, 8, 13*). During this phase of withdrawal of redundant labour it is plausible to improve agricultural productivity by relaxing the constant real wage assumption and permitting real wages to vary. This would quicken the arrival of the stage of commercialization by reducing the stage of shortage of agricultural surplus. The rate of change of the latter process depends on technology and factor substitution possibilities.

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THE ROLE OF AGRICULTURE'S CONTRIBUTIONS IN THE THEORY OF ECONOMIC GROWTH IN OVER-POPULATED COUNTRIES*

BANDHUDAS SEN

Agricultural Economist
U. S. A. I. D. Mission to India, New Delhi

I

Agriculture's contributions to economic development have been broadly classified by Kuznets[1] under three categories, namely, product, market and factor contributions. The last one comprises a labour contribution, when agriculture releases human labour to be absorbed by the growing non-agricultural sector; and a capital contribution when the resource transferred is capital, or funds for the financing of the non-farm sector, or savings.[2]

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1. Simon Kuznets, "Economic Growth and the Contribution of Agriculture : Notes on Measurements," *International Journal of Agrarian Affairs*, Vol. 3, April, 1961, pp. 59-75.

2. Johnston and Mellor consider the earning of foreign exchange through the expansion of agricultural export as an additional contribution. See Bruce F. Johnston and John W. Mellor, "The Role of Agriculture in Economic Development," *The American Economic Review*, Vol. 51 No. 4, September, 1961, pp. 571-581.