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Some thoughts on the Implications of Increasing Returns for Economic Development

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Introduction

This paper argues that the economics of increasing returns has shed important light on our understanding of various aspects of development. What it has not done so far, however, is generate a list of prescriptive remedies parallel to those advanced by the proponents of neo-liberalism. The paper suggests that this is in part because the effectiveness of its analysis depends on its being place and time specific and contingent on a range of institutional and cultural factors. This, it is argued, should not be allowed to prevent a fuller consideration of its implications for policy. However, given that simple rule based intervention is likely to be inappropriate, it is important to think of ways in which collective action can be organised so as to economize on entrepreneurial and organisational ability.

Washington Consensus?

A quick glance through some recent issues of *Finance and Development* uncovers much advice recommending openness, greater reliance on the private sector and a restricted role for the state in developing countries. On closer scrutiny, the advice does not always stack up. For example, in an article on adjustment and growth in Sub-Saharan Africa, Calimitsis (March 1999:p. 6) argues for the promotion of private investment on the ground that has a larger impact on growth than public investment. However, he immediately goes on to acknowledge that, in much of Sub-Saharan Africa, the growth of private investment is constrained by high transactions costs as well as high levels of uncertainty. In similar vein, in an article on private capital flows and growth published in the June 2001 issue, Mishra, Mody and Murshed make the point that when a country is poor and saves little, additional capital from outside the country can help it realize investment opportunities. However, they go on to acknowledge that ‘little foreign investment is directed to Africa and that is largely limited to a few countries with significant natural resources’ (p.3). These are just two of the many examples one can find in which positive assessments of the contribution of private capital to development are qualified by an acknowledgement that conditions of underdevelopment do not provide an attractive environment as

far as private capital is concerned. It is usual in these circumstances to acknowledge a role for 'careful but limited government activism' as long as this addresses failures in the working of markets especially co-ordination failures (World Bank, 1993: pp.10-11).

The notion that underdeveloped economies provide an unattractive environment for private investment comes as a surprise only if the implicit vision of the economic process is one in which diminishing rather than increasing returns are the norm. In the older classical vision of the economic process, the emphasis was on increasing returns. Growth was seen as being driven by the division of labour which itself was regarded as a function of development that had already been achieved. This way of thinking about the division of labour and development in turn implied that, in certain circumstances, growth would be self-reinforcing.

Development in Classical Economics

This older classical vision of the economic process goes back at least three hundred years. Late in the seventeenth century, in a series of writings on Holland, on the city of London and on Ireland, William Petty enumerated several of the factors giving rise to increasing returns. Success in trade bred success because in the course of trade merchants acquired market knowledge and the ability to specialize. Dense populations reduced transport costs and facilitated specialization of labour and instruments of production. The agglomeration of large populations in cities lowered search costs and reduced inventory costs. It also increased the probability of invention and facilitated the propagation and transmission of useful learning. Subsequent authors added to Petty's insights. For Henry Martyn, specialization was facilitated by standardisation while population density facilitated the creation of conditions for competitive markets. For Richard Cantillon, the market was a collective institution which overcame information problems that were an obstacle to trade and hence specialization. For Barnard Mandeville and Adam Smith, specialization provided stimulus for invention based on trial and error. For Martyn, Smith and Babbage competition provided a stimulus for technical advance. Babbage added economy of skill and reduced learning costs to the benefits of the division of labour mentioned by Smith and his predecessors. He also considered the relative advantages of large and small firms in relation to innovation, the introduction of new machinery and their ability to solve information problems relating to product quality. Babbage was of the opinion that innovation and mechanisation driven by competitive pressures could eventually result in natural monopoly though this was not necessarily a problem because potential competition would force monopolists to charge the competitive price. John Stuart Mill expressed scepticism about the ability of potential competition to discipline monopoly. Marx agreed that the forces of competition tended to centralize capital and while he allowed that this could retard progress in particular industries by reducing inter-firm rivalry, on balance, it allowed individual capitalists to increase the scale of their operations and provided a starting point for a wider re-organisation of production.

The Neoclassical Revolution and the Disappearance of Increasing Returns

With the advent of the neoclassical revolution there was a fundamental shift in the conception of competition and the nature of the economic problem more generally. Whereas in the classical approach creative agents were depicted as changing the nature of the constraints they faced, in the new approach, agents were seen as treating existing exchange and production possibilities as given and doing the best they could in the circumstances. Marshall made heroic efforts to accommodate classical concerns about growth and development within the new framework. In doing so, he introduced notions of multiple equilibria into economics. He also introduced the distinction between internal and external economies of scale as well as notions of imperfect competition and the life cycle of a firm. Despite these innovations, Marshall's attempt was not entirely successful. His twentieth century successors (eg Sraffa, 1925; Hicks, 1939; and Scarf, 1986) have concluded that it is in general impossible to incorporate increasing returns within the static equilibrium framework. This has implications for our ability to evaluate the consequences of a change in economic policy or a change in the economic environment. As Scarf put it:

When the economy is in competitive equilibrium with the production side described by a convex cone, the question...of whether a newly discovered activity may be used to provide an improvement in the utility of each consumer has a very simple answer. Under mild technical assumptions, a necessary and sufficient condition that such an improvement be possible is that the new activity make a positive profit at the old equilibrium prices....If in the competitive model, a new activity is discovered which can only be used *at integral levels*, its profitability at equilibrium prices is no longer sufficient to guarantee higher utility levels for all consumers....(Scarf, 1986:p. 510)

Scarf goes on to note that production sets with indivisibilities 'capture some of the main features that give rise to the efficiencies of large scale production' including set up costs and indivisible machinery whose employment becomes economical only at high levels of output. The fact that these are ubiquitous features of production processes means that, in general, there is no warrant to believe that free market outcomes will be efficient.

The Re-emergence of Increasing Returns

While increasing returns and other positive feedbacks did not feature strongly in the theoretical core of twentieth century economics, they did feature in discussions of trade, industrial location and of course development. Moreover, in the last decade of the century, increasing returns began to make a wider appearance as reflected for example in the work of David and Foray on network externalities, of Roemer, Krugman, Matsuyama and others on growth and of Krugman and Helpman and others on international trade. The new growth models have the merit of explaining some important facts of economic life such as continuing growth and non-convergence of income levels in rich and poor countries. Whereas, in the neoclassical growth model, the accumulation of capital was regarded as being subject to diminishing returns, the new theories allow for aggregate increasing returns. In some cases this is done by adopting a Marshallian

approach in which diminishing returns at the level of the firm are offset by spillover effects so that on aggregate returns are increasing. More recent versions have attempted to treat innovation and R&D more explicitly but this has involved a move away from the competitive model. Growth models involving increasing returns are typically characterised by multiple equilibria and may exhibit development traps from which the economy cannot escape in a system of laissez-faire. Escaping from such development traps is likely to require some form of active government intervention for example in the form of a subsidy. Where external economies are important and the returns on an agents' investments depend also on what other agents do, factors such as planning and leadership which improve the co-ordination of decisions can also enable an economy to escape from a development trap.

A model of the economy as a one-way street from factors of production to consumption goods is in many ways a misleading picture of the complex web of linked activities that make up a modern economy. Each generation inherits a set of activities, knowledge and practices from the previous generation which provides it with the basis on which it builds. The sorts of innovations that are possible may be constrained by the need for complementarities between different activity sets. This is what Schumpeter had in mind when he pointed out that whereas 'in the accustomed circular flow every individual can act promptly and rationally because he is sure of his ground and is supported by the conduct, as adjusted to this circular flow, of all other individuals, who in turn expect the accustomed activity from him', such complementarities between activities cannot be taken for granted by the innovator (Schumpeter, 1961). Some of complementarities and complexities of the real economy are captured in Brian Arthur and Paul David's work on positive feedbacks. They showed that a process characterised by positive feedbacks from whatever source could be modelled using a non-linear probability schema. Typically such models have a number of possible equilibria and which equilibrium emerges is not predetermined but depends on historical factors. Once an equilibrium has been reached, single agent switches to a superior equilibrium may not be possible so that some form of collective action is required. This very general framework can be used to throw light on a wide range of problems including the emergence of standards, economic geography, international trade and development. As Arthur (1988:pp.16-17) notes, 'the theme of "exit by co-ordination from an inferior low-level equilibrium ...runs through the economic development literature.' In this context, he mentions Rosenstein-Rodin's argument that because of increasing returns caused by indivisibilities and complementarities in demand, industries and firms may not find it profitable to expand separately but may find it profitable to expand via a co-ordinated effort. Arthur credits Hirshman, Chenery and Myrdal with further development of these 'synergistic' ideas.

Commenting on the QWERTY revolution (the reference is to the standard keyboard layout of typewriters which was the subject of the first paper to discuss David and Arthur's work on network externalities), Krugman (1995:p.223) wrote that this different way of thinking showed that the market did not invariably lead to the best possible solution. Instead, the outcome of market competition depends on what happens along the way. But Krugman went on to note that, while an acknowledgement of the importance of QWERTY refutes the near-religious faith of conservatives in free markets, it is not at all easy to decide which direction government should pursue (1995:p.243). Besides, although most economists were not

doctrinaire believers in laissez-faire, ‘ an acknowledgment of the power and effectiveness of the market is a central part of the professional identity .. of ..economists’.

Policy Matters

It will be useful at this point to say something about the broad policy issues emerging from new growth theory and the QWERTY approach. As noted above, both of these approaches place considerable emphasis on the issue of external economies and the need for forms of collective action to improve co-ordination and to supply or organize the supply of appropriate non-rival and public goods. Both approaches also suggest that a substantial effort of co-ordination may be necessary to break out of a development trap. At the same time, the QWERTY approach suggests that since small events not readily detected by the economist’s lens may be significant in determining the path of an economy or an industry, good policy requires luck and good timing. As Arthur puts it ‘a feel for the moments in which beneficial change from one pattern to another is possible’ (1990:p.85). Elsewhere in the same article, Arthur, however, suggests that policies appropriate to high tech industries include the aggressive seeking out of product and process improvements, strengthening of the national research base, encouragement for firms to pool resources to create marketing networks, technical knowledge and standards and so forth. Again, though for different reasons, he makes the point that timing is important because there is little sense in entering a market that is close to being locked-in or otherwise offers little chance of success. Arthur acknowledges that other policies such as subsidising and protecting new industries are possible in the circumstances described. However, he suggests that the value of these is debateable and, following Krugman, he argues that the pursuit of such policies is likely to encourage retaliation so that in the end nobody gains (Arthur, 1990: p.84).

Cautiousness or Ideology

It is clear from the above that the QWERTY analysis yields no simple rules for effective intervention – size, timing and appropriateness of intervention all depend on the concrete context in which they are proposed. This may be one of the reasons why the increasing returns literature has delivered a rather cautious policy agenda. But Krugman’s suggestion that the cautiousness is due to a belief in the effectiveness of the market mechanism being a fundamental part of the economist’s vision deserves closer scrutiny. Partly this is a matter of ideology and training. It also reflects a loss of confidence in intervention which is reinforced by past mistakes in developing countries, by the collapse of the socialist economies in the former USSR and Eastern-Europe and more recently by economic recession in Japan and elsewhere in East –Asia. Such failures have to be recognised and examined but while crisis may require a change of policy, it does not necessarily invalidate the basis of earlier success.

While recognition of the possibility of state failure justifies circumspection about what a state can and cannot do, it cannot of itself provide grounds for any assumption about market superiority. As the current crisis in the high

technology sector indicates, neither markets nor private firms are immune to error. Moreover, the disastrous performance of the market economy in Soviet Union during the last decade should also serve as a warning that market based reforms can lead to catastrophic results.

At this point, it is worth noting Nelson's consideration of the case for a private enterprise economy which was written twenty years ago and received rather less attention than it should. Nelson's argument was twofold. First, the analysis contained in contemporary welfare economics provided an extremely shaky intellectual basis for the faith of many economists that private enterprise was the best way of organising production. Secondly, most economists seemed to implicitly recognise this and in fact based their case for private enterprise on a different set of attributes: administrative parsimony, responsiveness and innovativeness. Nelson acknowledged that these arguments were important and relevant, however, he claimed that they were not properly articulated and rested on very soft analytic footings (Nelson, 1981:pp.109-110). The results of Nelson's own evaluation are worth recording here. First, on administrative parsimony, Nelson suggested that markets provided a cheap way of organising transactions mainly because they ignored all but a few dimensions of benefits and costs eg externalities. Where externalities were important and where change was large and unpredictable, it was by no means clear that markets could perform well from an administrative point of view. The second issue examined by Nelson was responsiveness. Here again, the conclusion is that claims about private enterprise's superior responsiveness can be sustained only in certain circumstances. As Nelson put it,

Of course, if plants were perfectly divisible and there were no economies of scale, and everybody responded gradually and proportionately to excess profitability, the system would smoothly converge. But add a little bit of lumpiness.... Then firms cannot decide what to do unless they know what other firms in the industry are going to do. Such a system may overshoot, cycle, or adjust smoothly but slowly (Nelson, 1981:p.103)

The final issue considered by Nelson was the innovative performance of private enterprise. His conclusion was that the case for private enterprise as an engine of progress related to the information and bounded rationality problems with which innovation was fraught.

Learning Rather than Experimentation

Thanks to Nelson's own contributions (Nelson, 1988) as well as those of Rosenberg (1992), Pelikan (1988), Porter (1990) and others, we now have a better understanding than we did of the strengths and weaknesses of a private and state enterprise in the field of innovation. Analysis of their work suggests that two features have been particularly important in those capitalist economies that have been most successful at innovation. These are the provision of space and incentives for economic experimentation and the presence of sufficient rivalry to encourage innovation (Prendergast 1996:50-51). However, as Rosenberg (1992:p.194) recognises, an environment exhibiting hostility towards experimentation may not be a huge disadvantage if the option of acquiring technology from abroad exists. This is generally the case for developing countries whose industrialisation in the present

century has tended to be based on learning or the borrowing of foreign technology (Amsden, 1988:p.38).

For developing countries, therefore, what is important is to create the 'space' and incentives for learning rather than for various forms of experimentation and the question we might pose is whether these objectives are best promoted by market based reforms? It is generally accepted that it takes time to learn and create supporting structures and that consequently infant industries need support if they are to come into being and prosper. The problem is that, as experience in several developing countries shows, infants do not necessarily mature into internationally competitive industries and as a result impose costs on consumers and on other industries. What is needed is a way of combining early support with strong incentives to mature. This view seems to be supported in recent work by Ales and Glaeser. Although they found that openness had positive effects on growth in poor countries, they also acknowledge that free trade could cause developing countries to specialize in basic products where there was limited learning by doing (Ales and Glaeser, 1999).

While the nourishment of infant industries to international competitiveness has never been easy, it is becoming increasingly difficult to achieve through a simple policy of protection followed by liberalisation because of high investment costs of entry, increases in minimum efficient scale and length of the learning period (Jacobsson,1993: p.257). Jacobsson agrees with the 'market fundamentalists' that any government policy aimed at fostering internationally competitive firms should have as its key concepts specialization, selectivity and export orientation. However, he disagrees with the market fundamentalists in arguing for selective, sophisticated and long-term support policies comprised of several policy instruments (ibid. :p.269). A difficulty that springs to mind here is that of costs. From the point of view of the public authorities, one of the big advantages of protection is that it is revenue generating whereas alternative support mechanisms eg soft loans and subsidies are resource using. For this reason, strategies which make protection of the home market contingent on the phased achievement of export targets such as those widely used in Korea are extremely attractive. A problem with this is that they can easily fall foul of anti-dumping rules so there may be scope here for international policy action to facilitate appropriate development policy.

For most developing countries, the process of development involves acquiring and absorbing knowledge already created with only limited

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