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Cumulative Growth and Unequal Development

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CUMULATIVE GROWTH AND UNEQUAL DEVELOPMENT

by

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ABSTRACT: The paper argues that industrial growth can be understood as a cumulative and reciprocal process of continuous transformation, the outcome of which reflects the mutual and self-reinforcing interaction of institutional, organizational and technological forces. Changes in market conditions induce economic reorganization which favors the introduction of new technology and this, in turn, further influences market conditions, thereby inducing further reorganization and so on. Thus, changes in one direction induce supporting changes which push the system further away from its initial position. During the process of continuous interaction, changes in competition and technical change, led by changes in the growth and composition of overall demand, determine the system's further expansion and structural transformation on a local and global scale. Depending on whether there is a continuous feeding on the process of growth and structural transformation, the economy may alternatively progress or stagnate. If growth sets well in, the economy developes horizontally and vertically overcoming more and more easily the reappearing internal and external constraints, thus securing near full employment macroeoconomic internal and external balances. If, instead, a 'vicious circle' gets established, the system falls into a long term trap of gradual slow down in production, endemic unemployment and persistent macroeconomic internal and external deficits. Eventually standards of living fall, production falls further, structural transformations are retarded and underdevelopment appears.

1. Introduction

The chronic slowdown in the growth performance of the industrialized economies and the associated business cycles, inflations and recessions, unemployment and hardship, bankruptcies and foregone production along with problems associated with the world debt crisis and the balance of payments constraints as well as phenomena of economic inequality and uneven development of nations have figured as the most prominent elements in recent public debates focusing on the identification of the causes of the maladies and the provision for thereby providing a successful bill of remedies. Some of the above issues can be found in the debates over the causes and effects of de-industrialization and the need for industrial policies (see among others Blackaby, 1979; Singh, 1977, 1982; Thirlwall, 1982; Martin and Rowthorn, 1986; Eatwell, 1982; Thurow, 1980; Branson, 1982; Krugman, 1983; Schultze, 1983; Norton, 1986; Porter, 1990; Krugman, 1994).

However, not significant public agreement has been obtained on the particular aspects that seem to be important in understanding the fundamental nature of dynamic economic processes and the causes of their malfunctions. Interestingly enough, one can see this confusion in the divergent opinions surrounding the debate of what constitutes an important economic indicator to looked at and guide our actions thereby. Indeed, some highlight the employment statistics, or those of aggregate output (and its growth rate), or the amount of investment in new capital stock, or the rate of improvement or deterioration in the economy's net export position, or productivity growth. Others will point to the general level of prices, or the latest figures of the rate of growth of money supply, or the level of interest rates, or the budget deficit or the exchange rate. Others settle on the level of real wages, or the availability and level of welfare entitlement, of the degree of inequality in the distribution of income and wealth, or the proportion of the population below the poverty line.

The different resolutions proposed for the improvement of the conditions for material prosperity and the suggested choices between alternative national models of market organization are embedded in the different visions underlying the conception of what constitutes material prosperity and whether the free operation of the market mechanism is capable of underwriting it. Thus, the meaning and economic impact of *laisser-faire* is elucidated according as the market mechanism is characterized by the individual agents' constrained utility maximization given their preferences and the size and distribution of their initial endowments in conditions of 'spontaneous' order mandated by perfect competition, or according as the unregulated operation of the system is such as to ensure its reproduction and expansion on a world scale, given certain structural characteristics and the 'institutional' composition of the real wage. Likewise, the more or less severe fluctuations according as better or worse times prevail are thought of as resulting from either the rather extraordinary short-term imperfections, uncertainty and lack of sufficient information, or the lack or excess of effective demand and the inherent inability of the system to regulate its equilibrating forces. Economic expansion or stagnation may be viewed either as the result of a Schumpeterian-like

competitive process aiming at the 'survival of the fittest' or as a Keynesian-like process characterizing a 'not violently unstable' (1936, p. 249) economic system, the normal operation of which leads to 'chronic subnormal activity' without any spontaneous tendency for improvement. Finally, technological dynamism may be the result of either market-induced stimulus or exogenously determined explorations.

It is a rather shared characteristic, however, that for a given level and composition of output and the array of technological possibilities available, the competitive organization of production in any economic system ensures that means will technically adjust to ends in a way that commodities are produced at the minimum possible cost (Smith, 1776, IV, p. 421; Marx, 1867, p. 442; Keynes, 1936, p. 378-9; Sen, 1975). The question, therefore, is not technical efficiency *per se* but rather whether the unregulated and systematic operation of the market mechanism, however defined, secures material prosperity within a context of a continuously changing environment of institutional arrangements.

Material prosperity is the result of productive transformations which constitute economic phenomena occurring, in conditions of continual technical change, through a process of reciprocal causation. The system's sustained expansion proceeds through the operation of propagation mechanisms (Frisch, 1933) characterizing the mutual and self-reinforcing interaction of institutional, organizational and technological forces. As Veblen (1919, p. 74-5) pointed out, '.. the economic life history of the individual is a cumulative process of adaptation of means to ends that cumulative change as the process goes on, both the agent and his environment being at any point the outcome of the last process.' Elements of this conception of the market mechanism can also be found in Myrdal's (1957) notion of *circular and cumulative causation*, certain aspects of which were further developed by Kaldor (1966,1972).[1] Economic growth is understood as a continuous process in which economic forces interact upon one another in a cumulative way. Changes in market conditions induce an economic reorganization which favors the introduction of new technology and this, in turn, further influences the market conditions which induces further reorganization and so on. Thus, changes in one direction induce supporting changes which push the system further away from its initial position.

However, there is no one way causal flow going from institutions to industrial organization, to the structure of the markets, to the running of firms and finally to their performance. All these elements are mutually interdependent and coexistent (Chandler, 1977). The strength of their continuous interaction, in conditions of changing competitive strain, determines the system's further expansion and structural transformation on a local and global scale. The above dynamic is induced and amplified by changes in the

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[1] Kaldor (see also Svennilson, 1954; Ricoy, 1987) put forward a more definite approach to the notion of cumulative causation by bringing together Young's (1928) dynamic economies of scale in manufacturing and Keynes' (1936) principle of effective demand. Kaldor's approach, however, is limited for it lacks 'microeconomic foundations', it presupposes some kind of exogenous limits to economic expansion in terms of a given 'natural' rate of growth and it uses a single-sector model, where all different structural characteristics are treated in the same manner (see 1976, pp. xxvi-xxviii, 1978, pp. xxi-xxv).

growth and composition of overall demand. Thus, changes in the growth and composition of demand raise the volume of production which brings about higher internal division of labor. The resulting reorganization of production makes possible the increase in efficiency of the existing productive capacities, which, in turn, creates the potentiality for increasing the plan & equipment's efficacy. The introduction of technologically more advanced equipment is thereby induced and further division of labor follows. As the volume of production increases, bottlenecks and capacity constraints appear which are eliminated through learning processes and recurrent investment activity. This feeds on further increases in the volume of production which, depending on the internal and external transaction costs involved, also shapes the industrial structures. The resulting changes in the technical conditions in the different phases of the production process bring about further changes in the division of labor, learning and investment which further affect the market conditions and so on.

In order to exemplify the cumulative nature of industrial growth and its developmental consequences, we will look first into the concept of structural change in section 2 and then we will present an account of the notion of competition in section 3 and the nature of technical change in section 4. The circular and cumulative process of contraction and expansion will be outlined in section 5 and the important role of effective demand as an engine of growth will be argued for in section 6. Finally, the implications for trade and development of the cumulative growth process will be presented in section 7, followed by some conclusions.

2. Economic Structure and Structural Change

Structural change may be best understood as 'morphogenesis' (Baranzini & Scazzieri, 1990, p. 265). This concept typifies a historical process in which the relatively persistent relationships among the component parts of an open economic system are subject to change for reasons related to both its internal dynamics and the impact of external shocks (Georgescu-Roegen, 1971, 1976; Lowe, 1935, 1976; Leontief 1987).[2] Structural change is described by the modifications in the complex connections between the technological relationships characterizing the network of the flows of produced commodities and services and the stocks of real assets existing in each economic system at any given time, and the explicit formulation of the behavioral features characterizing the existing institutional arrangements. This involves the time-sequence of the quantitative transformations from the initial to the final stages of production and

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[2] The analysis of structural change must distinguish between the assumption of a system's 'structural invariance', which is essential for determinable transformation paths, and its 'openness', which makes feasible a new type of structural characterization in the face of analytical 'blockages' within the existing description (Landesmann & Scazzieri, 1990, p. 97).

the rearrangement of tasks in order to carry the transformation out in alternative types of operational and hierarchical structures of the division of labor. The influence of different institutional arrangements in stabilizing the organizational evolution of production systems is long stressed by Veblen (1901, 1915), who defined institutions as 'prevalent habits of thought with respect to particular relations and particular functions of the individual and the community' (1901, p. 132). In the same sense, a 'dominant' set of 'true' assumptions (Georgescu-Roegen, 1976, pp. 205-6, 235), certain 'social middle principles' (Lowe, 1935, pp. 58, 140) as well as some 'essential hypotheses' (Morishima, 1984, pp. 135-6) are predominantly formed, which govern the relations between consumption, production and accumulation. Their decisive role is accounted for in the determinacy by which certain economic and social motives are established in conditions of generalized exchange as well as the extent to which any 'natural' characteristics of economic systems, like evolving population, patterns of consumer preferences and behavioral structures (Pasinetti, 1981, pp. 127-8), affect economic outcomes. In general, the evolution of organizational systems has demonstrated that productive organizations are organically associated with institutional elements in 'one-best-way' which provides a high degree of predictability and stability and thus consolidates quantitative efficiency (Hellriegel and Slocum, 1974, p. 71; Etzioni, 1980).

Economic growth may, therefore, be taken as synonymous with the dynamic evolution of a socioeconomic 'matrix', which comprises a set of 'clusters' of physical, technological and institutional features. The process is characterized by irreversible, quantitative and qualitative transformations. These transformations involve both changes in the clusters within the existing matrix and/or changes, through the creation of new clusters, in the matrix itself. These changes may consist in a series of gradual, time-specific and exogenously induced, modifications in the fundamental interrelationships without affecting the matrix's internal structure, or they may be induced by the normal operations within the causal mechanisms specified by the particular theoretical framework adopted. The course of the resulting dynamic can then be depicted as a time-sequence of altering relationships between variables moving from one tendential equilibrium to the next.[3] The process reflects the different ways that economic variables may follow a given trend, undergo a given rupture or find themselves on the traverse from one path to another (Baranzini & Scazzieri, ibid, pp. 271-2). The outcome of the continuously operating forces is a complex dynamic which determines, through mutual interaction, the path of the economic system as a whole (Anderson et

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[3] Time-differentiated sequential causality analysis can be found in Wicksell's (1901) 'cumulative process', according to which price adjustments, following discrepancies between the natural and the market rates of interest, occur at successive levels. It is also found in Myrdal's (1931) 'cumulative process' which is moreover associated with a 'given order of sequence' in the movements of the causal relations (Landesmann & Scazzieri, ibid, p. 103). The further elaboration of the concept has led to the modern 'temporary equilibrium' theory (Hicks 1946, Grandmont 1977), where sequential analysis is taken to mean 'contemporaneous causality'. However, sequential analysis, enriched by production-related phenomena, is revived in the analysis of stage production (Georgescu-Roegen 1971; Hicks 1973) and technological change (Rosenberg 1969).

all., 1988; Lorentz, 1989). The actual path will depend on the different rates of change of the different interactive forces involved.[4]

3. Competition as a Dynamic Regulatory Process

It is evident that the free operation of the market mechanism is characterized by a dynamic process, linking structural change with market behavior, which is the effective outcome of competition. The resulting pattern of structural transformations is then the resolution of the mutual interaction of persistent forces believed to be dominant in its operation. Competition is thus a process of rivalry between producers, taking the form of contests within existing markets and potential entry into new markets. Competitive rivalry is conducted in terms of cost cutting as well as product and process innovations. Its intensity affects the rate of growth of technical change in the form of new products and processes, the rate of diffusion of new ideas across firms and the allocation of resources between markets, as well as the evolution of the market structures themselves.

This dynamic interaction, however, if it is to be understood at all, must be characterized by certain regularities in the manner in which production, distribution and accumulation proceed within the framework of a generalized process of exchange. In his discussion of the conditions of "perfect liberty", Adam Smith (1776, book I, ch. 7) identified competition as a persistent element of economic behavior typified by the tendencies towards equality in the 'natural price' of the 'different employments of labor and stock.' Once the tendencies are at work, the operation of competitive markets will ensure that actual prices are relatively high when the quantities of the goods brought to the market are less than their effectual demand (the quantity that would have been bought at natural prices) and vise versa.[5] Moreover, labor and stock are free to move between different uses and establish 'an ordinary or average rate both of wages and profits' and hence a gravitation of market prices towards natural prices. This formulation was taken up by Ricardo (1817, p. 91), who emphasized the distinctive role of the free mobility of capital in establishing the general rate of profits. Marx (1869, pp. 649-50) elevated the significance of competition to the general level of capitalist relations of production and associated with it the rise and evolution of the capitalist mode

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[4]. The specification of structure as an evolving pattern of interrelationships is less restrictive than the traditional notion of a 'settled' equilibrium. The former's postulate of relative structural invariance allows for definite enough outcomes to be testable and, in turn, theory amendable. The latter's reliance on the uninfluenced working out, given initial conditions, of the implications of persistent behavioral principles towards the attainment of a final position, requires testability with respect to both the behavioral persistence and the correspondence between theoretical and actual magnitudes.

[5]. This working of the competition was known as the 'Law of Supply and Demand', but it should not be confused with the neoclassical *theory* of supply and demand, developed much later, that seeks to determine rather than characterize natural prices. Neither should Smith's discussion of the tendencies of concrete

of production. Competition is thus seen as the means for overcoming the constraints on the productive forces, and the labor power in particular, imposed by the existing institutional arrangements. The effectiveness of competition is destroyed and recreated by the tendencies for concentration and centralization of capital. Its strength is best seen in the circuit of capital, where a homogeneous mass of money value is seeking its maximum return through the reinvestment of the accruing profits into different uses.[6]

The process, through which these tendencies are established, has seen considerable transformations in its structural and organizational features. The historical change from craft production to factory production was associated with a modification in the organization of production (Smith, 1776, v. I, chs. 1-3; Marx, 1867, v. I, chs. 5, 14, 15, 25; v. III, ch. 5; see also Chandler, 1962, 1977). Initially production was carried out by small parallel batches or single units producing with high flexibility in response to volatile market conditions. The succession of operations, however, required using all the tools one at the time, thus resulting in long idle times in their utilization and, owing to complex skill requirements, in long training time for workers. As markets expanded and demand increased, the eventual exhaustion of investment opportunities within the old organizational system led to new directions for organizing production. The resulting reorganization was associated with increases in the firms' internal division of labor and reductions in the equipment's idle times. The activities were organized by the Marshallian single-product firm which was tightly controlled by one or few owners (Hymer, 1970, p. 42). Workers' tasks were progressively simplified but the existing equipment's diversification capabilities were increasingly enhanced. The resulting efficiency gains induced the introduction of more efficient technology which had meanwhile become available but it would have been completely uneconomic had it been used in the previous form of organization. The new equipment was technically capable of carrying out multiple tasks and thus progressively replaced workers in many operations thanks to the introduction of automatic devises. A gradual transformation of 'unitary' structures to 'multidivisional' forms (Auerbach, 1988; Aglietta, 1976, 4.III) followed which was associated with large firm size and rapid economies to scale. The intensification of the speed of the material flow of production succeeded in reducing unit costs thus encouraging mass production (Chandler, 1977, p. 257). The increased flow of profits created the conditions for increased market power for the large corporations. This cumulatively led to further

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market prices be confused with supply and demand functions, which are loci of equilibrium prices.

[6]. The development, later on, of the neoclassical theory of value and distribution by Menger, Jevons and Walras, as an alternative to the logical difficulties in the labor theory of value and the social radicalism associated with Marxism, retained the notions of normal prices and the general rate of profits, which were given the label 'long run normal prices' by Marshall (1920), but it changed the notion of free mobility of capital to a precise definition of the relationships presumed to exist between individual agents. The resulting concept of 'perfect competition' encompasses the idea that the economy consists of an infinity of individual agents, each having a 'negligible' influence on the market, and that economic theory is about constrained maximization.

expansion leading to the creation of dualistic intra-sectoral industrial structures characterized by high vertical integration and close market-oriented supply relations. These newly created organizational forms highly valued 'scientific' management and control and were associated with widely dispersed operations for the commitment and control of vast resources (ibid, p. 266). Tasks were classified and occupations codified. Productive and hierarchical structures were permanently characterized by bureaucratic rules to minimize human error and eliminate the unexpected (Fay, 1975). The resulting massive increases in the volume of production caused coordination problems in the balance of processes (Robinson, 1931, p. 25; Burbidge, 1968, p. 37) and capacity constraints, the elimination of which was effectuated through learning processes (Arrow, 1962; Rosenberg, 1976, 1982) and recurrent investment activity.

The subsequent increases in overall demand, during this process, along with the changing market preferences for diversified goods and services necessitated further structural modifications which gave rise to small firms with considerable capacities to adapt (Storey, 1982, ch. 6; Vercelli, 1988, p. 110; Sylos-Labini, 1956; Piore, 1980, pp. 55). However, from the 1970s onwards, the system of mass production and corporate development at the microeconomic level coupled with macroeconomic keynesian stabilization policies (Boyer, 1988; Glyn *et al*, 1990) underwent further organizational modifications caused by shaken market stability. The unexpected remarkable increases in input prices and the resulting inflationary pressures as well as the progressive saturation of product differentiation and existing market opportunities raised uncertainty. The difficulties were intensified by the newly adopted system of floating exchange rates and the appearance of recurrent financial disturbances (Minsky, 1985). Changing expectations with regard to the level and composition of skill requirements (Storey and Johnson, 1987) and work dissatisfaction resulted in labor unrest which was further exacerbated by the threat on the living standards posed by the LDCs' rising industrial competitiveness. The spread of information-based technology became a fact in economic life. As a result market structures were transformed and production was reorganized towards more flexible combination of the otherwise rigid individual productions, thus shifting the concern from expansion to differentiation (Becattini, 1978; Brusco, 1982; Piore and Sabel, 1984; Perez, 1985; Vercelli, 1988). The introduction of information-based technology induced a reorganization from multi-line and set-up time production as well as massive inventories towards 'flexible specialization' (Piore and Sabel, ibid, p. 17).

These transformations took place amidst a 'new enterprise culture' characterized by the revival of innovative neo-Schumpeterian entrepreneurship (Hughes, 1989) and the progressive development of a network of complementary strategic and cooperative industrial relations (Best, 1990). This not only provided considerable opportunities for the further development of small innovative firms but also made large size compatible with production flexibility (Dosi, 1988, p. 1128). Production systems, are now characterized by both a high level of flexibility in product composition and dynamic economies to scale. As a result, semi-finished goods and services can be acquired fast enough and hence product diversification

can be timely realized. However, the influence of different institutions on the spread of the information-based organizational structures is such that in some cases a high degree of flexibility is compatible with conditions of large scale production while in others small size production is favored.

The new dynamism is enhanced by changes in the labor markets as more and more entrepreneurial and 'ownership' energies are harnessed through increasing employee stockholding and control and limitations are posed on the role of top management (Best, ibid, p. 262). The ensuing loss of control forced large corporations to pursue decentralization and liberalization strategies (Bluestone and Harrison, 1982).

Flexibility is not so much ascertained through job generation by small firms (Birch, 1987) as by differentiation in the network of intra- and inter-firm relations. Its strength is measured by time economies in product life cycle, new product development, product changeover and the reallocation of productive resources from structurally depressed to fast growing industries. Competitive edge requires pursuing strategies of continuous improvements, through a blending of advanced technology, simpler organizational structures and multiskilled labor force, both in the traditional 'mature' industries such as cars, textiles, televisions and in the fast growing high-tech ones, such as computers and high-power electronics. Small firms have become internationally more competitive where the emphasis has been laid on design or product-led strategies, closeness to the customer, consultive parent-supplier relations and inter-firm, specialization-oriented, networks. The strength of cooperating relations across production stages, whether vertically integrated or across specialized, characterizes the prevalence of neo-Schumpeterian competition which creates an environment of organized market regulation (Best, ibid, p.180).

The transformative effects of the intensity of competition cannot but be spread out on a global scale. The 'multidivisional' organization of the big corporations allowed for production abroad to be organized, coordinated and governed like any other division within the firm. As long as it was cost-beneficial, national barriers did not deter the large corporations from producing abroad. However, the information-based technology has made it extremely difficult to maintain competitiveness by perfecting a process or product at home and then massively reproduce it abroad. As a result, the reorganization of production, associated with the newly shaped 'global corporation' (Ohmae, 1985), allowed for a limited range of products to be competitively produced abroad. Since product-led competitive strategies are sought, any foreign direct investment is directed only towards areas pursuing relevant strategies.

However, competitive edge is not always achieved as a result of reducing the coordination costs of the different stages of production, or the reduced significance of direct labor costs in total average costs and the lack of sufficient foreign experience in diversified managerial attitudes. On the other hand, competitive success in the home country does depend upon maintaining a strong presence abroad too. Given that competitive edge requires responding quickly to developments in products, processes and technology, the drive of large corporations to be 'insiders' stems first from the need to gain higher market

share which would generate profit margins high enough to enable the subsidization of strategic foreign investment. Moreover, the possibility of a merger with foreign competitive enterprises provides a competitive advantage with respect to domestic competition. Competitive foreign involvement, therefore, implies the formation of a global network of international consortia, cross-licensing agreements and joint ventures, mainly in high-tech industries. In this network inter-firm cooperation is combined with competition and alliances are involved.

The aforementioned structural and organizational transformations are not, however, associated with any fundamental changes in the manner in which the dynamic competitive tendencies work. The interdependent dynamic rivalries are still present. They are stronger today than they were a century ago and they are stronger among the larger than the smaller firms (Singh and Wittington, 1968, ch. 6; Brozen, 1970, 1982, pp. 239-40; Clifton, 1977, 1983). These rivalries are not associated with any optimum or unique state of industrial efficiency, nor should they be measured by the number of firms in the market, for they exist primarily under market conditions of concentrated oligopoly. Their intensity can be measured by the frequency and institutionalization of the continuous structural modifications. It involves the sum total of strategic moves and countermoves made by firms in a market per unit of time.

Free capital mobility is increasingly associated not with the atomistic enterprise but the plethora of organizational structures and competitive strategies of the today's industrially and geographically diversified and publicly held corporation. Economies of large-scale organization and large scale budgets and staff increase the number of competitive strategies available and the intensity of the search for competitive advantage. When finance is committed to industry as fixed capital it is at once immobilized for its economic life. Free capital mobility, therefore, implies gradual diversification in products and processes. It is nowhere and never before more fully developed, innovative and integrated in a world scale, as in today's financial markets. Under its intensifying influence competitive behavior is forced on a wider spectrum of human activities, beyond strictly economic exchanges.

The very interdependence in decision-making among oligopolistic firms causes business and profit moving across firms, industries and markets and renders the ex-post rate of return fully competitive and certainly beyond the control of the individual firm. Thus, competitive pricing is concerned with the ex-post rate of return which is determined by many forms and intensities of market behavior of which the ex-ante mark-up over prime costs is only one. The intense competitive tendencies still lead to a uniformity, even on a global scale, in the accounting rates of return across the price system leaving the question of competitive rivalry and economic efficiency open.[7] However, the extent for achieving the average rate of return is conditioned by increased uncertainty and bounded rationality. Price for a homogeneous product

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[7] Recent neoclassical attempts to reconstitute the axiomatic theory of competitive value on the basis of game theory are still more *a priori* theorizing, for the absence of rivalry is now associated with a non-cooperative equilibrium, independent of the number of agents, that may entail dynamic strategies of N

would be bid down to its normal competitive minimum not by unlimited entry of one small firm after another but an unlimited number of imperfectly known strategic moves by the competing oligopolies [8].

In conditions of fully competitive price behavior, efficient production is obtained by the use of the 'best-practice' technique across firms or sectors. Given the linkages within and between firms, optimal efficiency conditions are nowhere to be found in the use of production technique but, instead, viability conditions for each given scale of output need to be specified. This specification of technology formally leaves open the efficiency question of market processes. Therefore, while associated with even stronger and faster movements to capture market share or eliminate excess profitability, intensely competitive behavior should not be classified as 'maximizing' or 'satisfying'. Efficiency is nowhere *a priori* warranted nor is highly energetic behavior from constant striving absent from the heart of the facts.

The intensified competitive tendencies are generating an ongoing bias against efficiency-enhancing forms of strategic corporate behavior. Forms of corporate crisis management, such as 'asset-juggling', are favored which do not have any beneficial impact on product quality nor do they enhance the efficiency with which commodities are produced, distributed and sold. This leads to the creation of risk-averse corporate cultures and to decision-making under conditions of strictly bounded rationality (Erigi, 1986, 1989). Organizational structures are linked by an 'information' network of economic and technological exchanges and interact according to game rules which they can often influence. Thus, decision making, however energetic, is hardly associated with optimal outcomes. The eventual crowding out of the Schumpeterian forms of dynamically efficient market processes, according to which extra normal profits bring about sustainable forms of risk taking entrepreneurial activities, is another welfare loss due to today's laisser faire. The capitalization of finance on pure finance rather than real asset creation has become almost an epidemic of market processes that are dubious to the general welfare and moreover increase the cost of capital for productive uses.[9]

4. The Nature of Technical Change

The continuous introduction of new technology that characterizes the growth process brings about structural change which raises questions on the efficient operation of plan and equipment and on the

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periods contingent on past outcomes (see Mas-Colell, 1980).

[8] The notion of perfect competition that characterizes the neoclassical theory of value and distribution requires input price flexibility. However, it is difficult to reconcile the above notion with the strategic and organizational flexibility which characterizes the competitive tendencies of modern capitalism. The reason is that they presuppose product differentiation and low predictability of market evolution and thus implicitly involve market structures which are not perfectly competitive.

[9] The relationship between takeovers and the distribution of asset ownership is an important indicator of modern competitive structures.

appropriate decisions concerning the reorganization of production and the course of investment expenditures. Economic growth results insofar as these questions are effectively resolved (Freeman, 1974; David, 1975; Dosi, 1984, 1988; Rosenberg, 1976, 1982; Nelson and Winters, 1977, 1982; Metcalfe, 1989; Amendola and Gaffard, 1988). A method of production involves the technical conditions of production within a specific organizational system (Taylorism, Fordism) and a specific industrial organization scheme (craft production, mass production, flexible production), conforming to a given institutional set-up. The succession of productive methods reflects innovative activity involving changes in both technical processes and product quality and/or the independent influences of changes in the general market conditions. The evolution involves the phenomena of non-convexities, scale economies, indivisibilities, externalities, public goods, uncertainty and non-price competition.[10]

Technological change does not follow a rhythm nor is it a random process. It is developed step by step from an initial impulse as a particular answer to given problems in a specific environment. It involves the state of the art of the innovations already in use. It is evolutionary in that it normally involves the gradual rejection of parts of the old technology rather that its overall rejection. At each different moment different paths are open and different decisions can be made leading to different, but not all feasible, alternative developments. Technical change tends to be cumulative, for the likelihood of success in the completion of the new technology depends on past developments and the accretion of experience, knowledge and technological mastery that results from the 'learning process' induced by the application of technology.

The knowledge implicit in a technology is both practical and theoretical as it includes "know-how, methods, procedures, experience of success and failures and also physical devises and equipment" (Dosi, 1984, pp. 13-14). Information is produced under conditions of uncertainty shared by imperfect markets in which risk-related activities cannot be efficiently ensured due to moral hazard (Dasgupta and David, 1987, p. 520; Arrow, 1962). Firms learn from experience and 'pose mechanisms for maintaining memory over time in the face of changes in personnel' (Metcalfe, 1989, p. 57). The selective and tacit process of knowledge acquisition concerning the use of specific equipment 'cannot be written down in a 'blueprint' form and therefore, it cannot be entirely diffused either in the form of public or proprietary information' (Dosi, 1988, p. 1131).

Technological progress may be better understood as a succession of technological paradigms (Dosi, 1982) or technological regimes (Nelson and Winter, 1977) each referring to 'a common approach to certain technological and productive problems' (Nelson and Winter, 1982, pp. 258-9). A technological paradigm defines the economic needs at a certain point of time and the means for their fulfillment. For the task under consideration specific scientific principles are utilized and the material technology to be used is

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[10]. It is interesting to note that standard neoclassical equilibrium theory usually ignores these phenomena, or if not, it treats them as if they are of secondary importance.

provided. Thus, technological possibilities are each time understood within 'a model of solution of selected technological problems, based on selected principles derived from natural sciences and on selected material technologies' (Dosi, 1982, pp. 14-15). Technological paradigms may involve small internal changes while fundamental changes give rise to new paradigms. In the latter case, 'the activity of technological trade-offs' results in improvements within a particular path of development and identify a natural trajectory (Nelson & Winters, 1977) or a technological trajectory (Dosi, 1988).

The conceptualization of technologies and technical change based on paradigms also helps in avoiding a sharp distinction between the relative importance of 'market-pull' vs 'technology-push' sources of innovation, that is whether technical change is induced by demand changes or is stimulated by the autonomous development of technological opportunities. 'Market conditions exert a powerful influence on the contact of technological search, but they do so primarily by stimulating, hindering and focusing the search for new technological paradigms' and their evolution 'makes possible and stimulate improvement in products and the methods of production' (Dosi 1988, p. 1141-2).[11]

In the initial phases of its development, each technological paradigm, when established, remains quite sticky in its basic imperatives and therefore permits considerable internal improvements. These come about as a result of learning processes. Since new products, equipment or techniques do not come about as a 'perfectly known', 'fully grown' output of R & D activities, there is initially a fundamental lack of understanding and a great deal of uncertainty as to their use and actual performance. The successive elimination of uncertainty and the consequent knowledge acquisition come with experience in the production and operation activities as well as further R & D. As those activities take place and decisions are implemented different problems materialize and 'tensions, disproportions and bottlenecks' are encountered. The more those activities are speeded up, the more will problems assert themselves, the more the need to solve them will be felt and therefore the stronger the inducement to solve them will be. Learning and success results from devising solutions to arising problems. To the extent that learning is effective, experience and knowledge are accumulated and skills and capabilities are developed. Thus, each successive step becomes potentially easier. As a result the efficiency of learning and using processes and consequently that of production too are raised. In many cases the resulting efficiency gains continue even after a fundamental change in production technology has occurred.

Demand, in turn, becomes important when fundamental changes (Schumpeterian innovations) are under way. They are discontinuous events and imply 'changes in some product function which is the first order of magnitude' (Schumpeter, 1939, p. 94; also Rosenberg, 1976, p. 300, n.7). They are associated with a series of secondary inventions, innovations and modifications selected in a tacit, specific and cumulative manner along the trajectory defined by a technological paradigm. As overall demand changes,

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[11]. For an extensive discussion of the 'demand-pull' vs 'supply-push' sources of innovation, see the collection of articles in Mokyr (1989).

the resulting variations in the volume and composition of output induce further expenditures in R & D. In this sequence, organizational and technical problems are discovered and gradually resolved through learning processes. This sequential process, to the extent it is successful, results in improvements and modifications in the consumers' wants and producers' requirements. The introduction of new products or processes is thereby induced which, however, raises fundamental uncertainties as to the nature of demand. Consumers are both uncertain about their preferences and unaware of the new products and their comparative qualitative characteristics. Users of capital equipment are uncertain about their requirements and lack knowledge about the characteristics of new technological alternatives and their relative fitness in the production process. It is only through actual experience in the composition of consumption (Pasinetti, 1981; Vernon, 1966) and the effective use of equipment in production that uncertainty can be resolved and knowledge increased (Rosenberg, 1982). The expected evolution of consumers' wants along with the expansion of consumption baskets to lower income brackets induce R & D developments and technical change in the consumers' goods industries. The specific requirements of fast growing and highly innovative industries call for increased investment expenditures in the capital goods industries (Rosenberg, 1976; Schmookler, 1966). The effective success, therefore, and further continuation of the ongoing transformational processes through the introduction of innovations depends on the dynamics of demand and the actual validation of the markets effective growth.

5. The Circular Process of Cumulative Expansion and Contraction

Structural changes and continuous technical change cause market transformation and growth. The growth of the markets raises the demand for output which, in competitive conditions, induces internal reorganization. The required reorganization increases efficiency and opens up new possibilities for profitable investments. Capital accumulation is thereby induced and the introduction of new technology follows. The new equipment, however, affects the relation between variations in the level and composition of demand and variations in unit costs at different levels of utilization and operation. The extent of the effect will depend on the degree of adaptability of plant & equipment. Thus, depending upon the extent of technical indivisibilities and complementarities in the production process, the greater the reduction in 'process time' or 'response time', the more efficient the operation of plant & equipment will be. The extent of efficiency gains will depend on the prevailing relations between intermediate stages within an operational level and among operational levels, such as production, selling and marketing. Rising efficiency induces progressive specialization at successively lower stages in the production process. This is due to the accumulated backward linkages, at each given stage, in the network of the inter-industry relations which come to share basically the same process of production. This causes a process of

technological convergence which brings about modifications in the horizontal links between intermediate stages and in the vertical links between different operational levels.[12]

Given the quantitative and qualitative choices forced by modern competitive tendencies, product quality and reliability are added to lower unit costs as essential ingredients of competitiveness. Efficacy itself is an inherent qualitative characteristic of a product's competitiveness. Increased production flexibility requires that, at each intermediate stage, semi-processed commodities must be appropriately related to the method of process execution. Flexibility of production is increased if the reorganization allows for reductions in the 'response time' in relation to the 'process time'. This induces horizontal and vertical recomposition of labor, increasing skill integrating functions and a redefinition of roles according to objectives and control. One effect of this responsive process is to alter the extent of the division of labor, another is to render older organizational structures obsolete due to their inability to adapt. New models arise which can ensure more consensus and personal responsibility on the part of employees and the capacity to make the firm's objective their own. This increases the quality of production and decreases monitoring activities during the process. Improvements in the efficiency and efficacy of production and hence in competitiveness can be also attributed to other factors whose effects may occasionally run counter to the effects that changes in the scale of the production bring about. The economy's capital endowment, entrepreneurial characteristics, technical training, market structures, government regulations and the product's life cycle are alternative channels through which time profiles are specified and new technologies are adopted and spread out. The impact of all of the above is different when institutional environments change.

As markets expand and demand requirements are diversified, the ongoing structural transformations are reflected in the modifications characterizing the network of inter- and intra-firm relations. The dynamic economies to scale inherent in the growth process are associated with either net increases in size, or mere multiplication of existing structures, or additions of entirely new, diversified, capacities. The associated changes in sectoral demand and supply relations bring about a reallocation of productive resources. The whole structure of production flows, at each intermediate stage, is being gradually rearranged. This changes the degree to which inputs are (wholly or partly) produced within each production unit or are externally supplied as well as the degree to which outputs are sold internally or externally.

The process of expansion follows a reciprocal causation. On the one hand, the growth and flexible specialization of certain firms, through the internal backward and forward linkages within industries and between industries, induce further growth and flexible specialization of other firms, which induce further

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[12]. It is important to note that the Georgescu-Roegen (ibid) fund-flow model can deal better with the relations between the intermediate stages and phases of production, without assuming, as Stigler (1951) does, the independence of unit costs in these stages.

growth of yet other firms. This makes obvious that the rate of overall efficiency gains depends on the rate of expansion of flexible manufacturing. As the overall manufacturing sector's degree of mechanization and flexible specialization progresses, the complementary and subsidiary intra-industry linkages spread the mechanization and specialization out to the individual industries and firms and speed up their relative growth. Thus, increasing demand for manufacturing output enhances overall efficiency.

On the other hand, high 'opportunity' to efficiency and/or rapidly growing demand for certain products favor the development of particular 'key' industries in the manufacturing sector. Owing, again, to the inter-industry linkages and the degree of flexibility, the development of those 'key' industries increases efficiency and benefits the development of other industries across the sector. This is particularly important for 'mature' industries which thereby receive a new lease of life from developments initiated elsewhere in the sector. Thus, increased efficiency in an industry has a direct positive effect on the sector's demand requirements.

In this view, efficiency appears as a dynamic, macroeconomic-structural phenomenon, which relates to the process of mechanization and structural transformation of the manufacturing sector as a whole. It reflects the process of growth in terms of internal transformation and flexible reorganization. At each point in time and space, efficiency in the manufacturing sector reflects the strength of the inter-linkage network. Its level is defined by the level of existing degree of specialization, mechanization and diversification. Its rate of change reflects ongoing transformational processes and continuous specialization. The level and rate of change of efficiency are not uniform in all industries but depend upon the exploitation of the 'opportunity to efficiency', which in turn defines a 'standard' for evaluating the actual performance of the different industries.

Opportunity to efficiency alludes to the specificity of a single production unit. It refers to the different organizational and technological forms specific to it and the differences in the ability to translate costly and unequally distributed information into knowledge. Due to the specificity of technical knowledge, the availability of choices at a certain time is limited and is not always known a priori. More generally, opportunity signifies the variety of responses to the evolution of environmental conditions which has determined the system's dynamic path.

Maximum efficiency may not be achieved without production flexibility. The latter involves the ability for reorganization and technical improvements within the firm, but it also has a macroeconomic dimension. Labor market conditions must be flexible enough in terms of their ability to functionally adjust workers' skills as well as to modify the number of employees or working hours as required. The presence of segmentation and dualistic markets may constitute an impediment to the cumulative process. Wage flexibility in relation to changing labor market conditions adds to the picture. Finally, the sensitivity of input price elasticities and the ability of suppliers to respond quickly to changes in input requirements, in changing market conditions, constitute important aspects of a flexible system.

Opportunity to efficiency, in modern competitive conditions, means also the choice of a competitive strategy. It is not always necessary that market success, in the development of a new product, should presuppose independent strategic capability. Properly adaptive strategies in both manufacturing and services can be equally successful.[13] The widening of individual participation in the production process and the associated spreading out of the allocation of entrepreneurial activities are associated with increased competitiveness. However, the range of possible structures and strategies, even though not determined by, is limited by technology due to the complementarity characteristics between the various stages of production and organization. Moreover, success in strategic moves is not independent of the intensity of international competition. The decentralization of production by global corporations may not achieve the desired effects due to local constraints and the risk involved that subsidiaries will turn into future competitors as managers develop entrepreneurial skills.

As the growth process continues, the need for eliminating the arising bottlenecks and slacks in the process of inter-sectoral expansion induces a process of learning and further technical refining. The impact of uncertainty is successfully minimized by successive trial and error procedures. In the process, new possibilities for profitable investments are created which raise optimistic expectations. Once investment and consumption expenditures are under way the validation of further growth results. However, investment choices must take proper account of the nature of indivisibility and complementarily characterizing the different production aspects of each sector, the conditions of separability of the different intermediary stages as well as the duration of the elementary processes, the specific organizational system adopted and the amount of internal and external transaction costs involved.

Thus, the growth of demand for manufactures gives rise to efficiency gains which, in turn, lead to growth of output in the manufacturing sector and in the economy as a whole. The particular development path of the production unit is cumulative, irreversible and specific to each production unit. For each scale of production there is a certain corresponding stage of development of 'concrete knowledge' regarding the use of specific machines and equipment. Not many alternative techniques are there as in a blueprint from waiting to be optimally chosen according to the needs of the different scales of output. Technical change leads to both a change in the production unit's minimum efficient scale (the scale at which unit costs cease to fall) and an expansion in the range of scale between minimum and maximum levels. An innovation may be 'centripetal' or 'centrifugal' according to the economic conditions it is applied (Blair, 1972, ch. 6). Hence in competitive conditions favoring the small scale production, centrifugal characteristics may be exploited. In competitive conditions favoring large scale production, firms will take advantage of the centripetal characteristics of the available techniques. The type of the overall dynamic path depends on the

[13]. There is a fast growing literature on the extent to which adaptive strategies can be successful, particularly as it refers to the 'economic miracles' of late industrialization of East-Asian countries. Indicatively, see Amsden, 1989; Amsden & Hikino, 1992.

economy's priorities and its institutional limitations. Thus, depending upon whether priority is given to maximization of current consumption of a certain type vs feature consumption and growth, or to maximization of present employment vs mechanization and productivity increase, or whether the existing institutional arrangements allow for more transformational possibilities or narrow down the range of alternative paths, a certain trajectory of expansion follows.

The level of efficiency can be taken as an index of development and its rate of change can be taken as an index of growth and development performance. The overall level and rate of growth of development in each country conditions the level and rate of change of efficiency of any particular industry in different countries. Thus, countries experiencing relative to their competitors higher rates of growth and transformation and therefore higher rates and growth of overall efficiency in manufacturing will tend to experience higher overall rates of growth in the individual industries as well (Eatwell, 1982). Since the opportunity to efficiency is realistically taken to vary among different countries due to its dependence on learning, the accumulation of experience, mastery and technical progress, all of which in turn depend upon the growth of markets, the international differentials in industrial performance are related to the opportunity differentials. Thus, since the degree of opportunity differentials determines the degree of international differentials in growth performance, the correspondence between the rate of change in efficiency in manufacturing and the rate of change in individual industries will tend to be more convergent in high opportunity industries and vice versa.

A 'pause' in the expansion of the system may well lead to structural stagnation and eventually to a loss in competitiveness. A slowdown in market expansion and hence a shortage of effective demand tends to get amplified throughout the economy, due to the reverse effect of the dynamic economies to scale. Such a cumulative downturn is but the manifestation of the market mechanism that transmits impulses and inducements. In a similar manner, as change calls for supporting change, its absence leads to stagnation. It is in the nature of the operation of markets and competition that 'growth requires growth' and 'success breeds success'. The market is prone to cumulative movements and once in a growth path it tends towards cumulative self-expansion. Yet, if the growth process looses its momentum and slows down, a tendency towards cumulative downturn ensues. 'A capitalist economy cannot afford to stay still because, if it stops expanding, it falls back' (Pasinetti, 1982, also see Marx on the process of capitalist development and of competition as a dynamic process).

6. The Role of Effective Demand in the Growth Process

A faster growth of markets and demand and makes it easier to create new ways of expansion. These involve switching from one dynamic path to another. This endows the innovative process with a

'higher degree of flexibility'. The resulting reorganization lowers the risks and costs involved, thus leading to a higher rate of innovative effort. The introduction of new technology is associated with coordination problems which lead to a more effective learning process and a higher rate of accumulation of skills, knowledge and mastery. The reallocation of resources also causes 'tensions, disproportions and bottle-necks', the solution of which results in raising efficiency across manufacturing. To the extent that the sequence of problem-solving activities that the process of technical change entails is dealt with more efficiently and flexibly, the expansion process proceeds more rapidly.

The validation of the dynamics of efficiency owing to increasing returns, learning and technical progress in competitive conditions depends on the workings of Keynes's principle of effective demand. This is culminated in Kaldor's definite development of Myrdal's idea of cumulative causation in industrial development, according to which the growth of demand constitutes the leading factor in the 'self-reinforcing' dynamics internal to manufacturing. The growth of demand determines the growth of output and leads to rising efficiency in production. The continuation of the cumulative process or its possible reversal depends on the 'next round' of demand. This reflects the ability and willingness of demand to respond to the inducement for further growth provided by the rise in efficiency. Thus, the growth of demand is the 'weak link' of the internal dynamics of manufacturing. The circular process of cumulative expansion is, therefore, associated with a 'degree of openness' regarding the conditions of its actual validation. This stands in contrast to Young's deployment of Say's Law as the closing element in the system.[14]

The key role of demand rests on the 'independence' of capital accumulation as the driving force in the process of economic growth. Capital accumulation is central to technical progress for it induces and finances the innovative process. It creates both the demand for produced goods and the capacity for them to be served. It 'provides the incentives and the means of further expansion.' Thus, the potential for a continuous self-expansion of the system finds no limit. 'Carrying itself by its own bootstraps is just what a capitalist economy can do' (Robinson, 1962).

The independent role of the rate of accumulation does not mean that the latter is fixed and, therefore, invariant with respect to changing economic conditions. Instead, investment behavior reflects

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[14] Young's analysis is based on the classical version of Say's Law according to which the growth of markets depends on the growth in the volume of production which, in turn, is determined by the rise in efficiency. But since it is the latter that, via increasing returns, is determined by the growth of the markets we have circular reasoning without any degree of freedom in it. Since the expansion of the markets leads to efficiency gains through mechanization and structural transformation which 'open up new opportunities for further change which would not have existed other wise', then any given 'impulse' is amplified cumulatively and the growth therefore of demand results in an endless reaction of sectoral supplies and demands, all through the interindustry linkages. Thus, 'change becomes progressive and propagates itself in a cumulative way'. What is missing is an understanding of what transforms a 'potential' opportunity for growth into 'actual' growth. Any reliance on Say's Law deprives the analysis of any independent element that leads the system.

the influence of both economic and non-economic factors. The manner that investment behavior responds, among other factors, to the growth of the markets (strong accelerator effects) and the resulting rise in efficiency (strong distribution effects) along with the consumption's reaction to industrial expansion, sets the pace for the 'self-reinforcing' dynamics in manufacturing. The strength of the response accounts for the possibility of a 'reverse link' in the circular and cumulative process of the capitalist development. The increased industrial growth brings about technical change which affects the 'price' and 'quality' characteristics of the capital goods requirements in the inter-industry expansion of markets. Capital goods diversification, along with the growth of consumption, induces investment expenditures. The beneficial results of capital accumulation would depend on the flexibility of the labor market conditions. At the microeconomic level, reskilling and training must respond rapidly. At the macroeconomic level, the impact is assessed through the reallocation of inputs, like the quantitative effects of investment on labor demand and the labor market's ability to respond.

The rise in industrial expansion increases quantitative efficiency which leads to growth in the demand for consumer goods. The growth comes about as a result of the increases in real incomes and the expansion of consumption into lower brackets of the income distribution structure. The overall growth effect of the interaction 'industrial expansion - consumption - further expansion', will depend on production flexibility and sustained demand pressures. The composition of consumption in terms of changes in the product mix demanded and the evolving structure of income distribution affects the overall growth of consumption to an extent determined by the different elasticities of demand for different consumption goods and of different income levels. However, increasing consumption tends to be retarded by relative saturation and, at high income levels, the growth of demand tends to slow down and even stagnate. These tendencies however are continuously overcome by the 'innovation' and the 'quality-differentiation' effects of rising efficiency due to technical change and structural transformation (Pasinetti 1982).

In the sequence of 'industrial growth - consumption - investment - industrial growth' the growth of real wages is of special significance. Real wages constitute both a source of income and a cost of production (Kalecki, 1971). Rising real wages, as a form of income, lead to rising consumption demand and therefore induce output growth. This in turn leads to higher efficiency and it may therefore lead to higher investment expenditures. Rising real wages, as a portion of total costs, may induce, *a la Marx*, a process of dynamic substitution towards higher mechanization. This implies a higher rate of investment and productivity. Thus, the demand and substitution effects of real wage growth can be seen to imply a 'cumulative-causation' pattern of growth. The growth of real wages leads to growth in consumption demand and to dynamic substitution of capital to labor and therefore to investment and productivity growth which in turn lead to higher wage growth and so forth.

7. Foreign Trade and Uneven Development

The continuity of the circular process of cumulative causation is affected by foreign trade performance in manufactures. The growth and composition of net exports are fundamental elements in shaping the process of growth and structural change in the economy. Changes in the level and composition of demand, both domestic and that for net exports, leads to higher domestic economic growth and this results in rising overall domestic efficiency which in turn, via price and non-price factors, increases competitiveness and hence boosts exports. This leads to further growth and changes in the composition of net exports and thus of demand and output and so on.

Foreign trade, through the balance of payments position, may impose an effective constraint on growth. There are two principles of fundamental importance to economies which are highly integrated into international trade (Thirlwall, 1982; Rowthorn & Wells, 1987; Coutts & Godley, 1992). First, in the medium run the warranted growth rate of the economy depends on the growth rate of exports relative to the share of imports in domestic demand. Growth of output at the warranted rate will imply that exports (and other net income) are paying for imports. This is the 'balance of payments equilibrium growth rate'. This rate, given the 'normal' timepaths of the other components of the current account, depends fundamentally on the balance of trade in manufactures and therefore on the growth rate as well as the normal competitiveness of manufacturing. Its significance is to be understood in relation to the economy's 'socially necessary' growth rate. The latter implies a socially acceptable level of output and employment growth and a sufficient rate of structural transformation, learning and technical progress. For that to be possible, the economy must be characterized by an 'efficient manufacturing sector' (Singh, 1977). Second, if the equilibrium growth rate is greater than the rate warranted by foreign trade performance, then growing trade deficits will be generated which will be unsustainable because they will lead inexorably to a rising ratio of debt to GNP. At some stage the rising burden of servicing the debt will require the economy to generate large trade surpluses so that a net transfer of resources has to take place in order to pay the interest on accumulated borrowing. Alternatively, the economy will be trapped in a syndrome of slow growth and unemployment will rise from one business cycle to the next. As foreign borrowing increases to balance the resulting current account deficit, the cost of borrowing will rise but there is no automatic mechanism of self-adjustment. The attachment of risk premia on capital flows may not work in a gradual and smooth manner. Indeed, as the ratio of foreign debt to GNP rises, the world financial markets become increasingly nervous about a collapse in the exchange rate and the consequent capital losses. Once the exchange rate starts to fall, speculative actions are likely to be further destabilizing, leading to a rapid fall in the domestic currency. The use of higher interest rates to defend the domestic currency and thus balance the current account through capital inflows will push the domestic economy, through adverse effects on investment, into recession with the consequent slowdown in efficiency growth and further loss of

competitiveness. A higher rate of net inflow of interest, profits and dividends from some source (oil, foreign remittances, etc) compared to the economy's growth rate may not reverse this tendency if the economy falls into a 'wealth trap', that is using the revenue to absorb more manufacturing imports rather than invest in manufacturing.

The dynamics of foreign trade and thus of domestic growth depend also on economic growth and efficiency abroad (Sayers, 1965; Singh, 1977). International production and foreign trade are characterized by a set of complementarity-substitution relations. Foreign growth 'complements' domestic growth insofar as it widens the opportunities for the expansion of domestic net exports. The competitive tendencies for product and process improvements are associated with a division of production into various components and stages and their dispersion into worldwide locations. The worldwide movements of the component parts for processing, assembling and selling considerably affects the growth of trade. This is particularly associated with the growth and dispersion of intra-firm and intra-industry trade, the growth rate of which is affected by the manipulation of transfer prices due to the transnational firms' monopoly power and control (Frobel *et al*, 1983, p. 134; Ietto-Gillies, 1992, p. 165). At the same time, foreign growth enlarges the supply of commodities that can 'compete' with domestic production in capturing market share. Thus, rising foreign efficiency, in conditions of stagnant domestic competitiveness, results in still lower growth of domestic net exports. In addition, the competitive processes in world markets entail a fundamental 'composition effect' in the structure of trade. Fast growing and flexibly organized countries tend to gain market shares particularly in those products and processes associated with the 'highest opportunity to efficiency' and the highest potential for market expansion while 'weak' or inflexible countries tend to be pushed out of those trades. The different ability to not only cut costs but also flexibly transform the industrial and employment structures seems to account for the persistent differences in manufacturing competitiveness between individual industries and across countries (Sengenberger *et al*, 1990).

In the course of global growth, a country's 'weak' competitive position results in lower growth of its net exports which leads to a lower growth of its domestic output and thus lower rates of investment which leads to lower rates of structural transformation and technical change. The ensuing loss in competitiveness leads, in a 'self-perpetuating' manner, to still lower growth of net exports and so on. At the same time, increased foreign competitiveness results in qualitatively superior foreign products which will eventually succeed in penetrating the domestic markets. Eventually, the country will find itself 'balance of payments constrained' as the equilibrium rate falls below the 'socially necessary' rate. The ensuing disequilibrium in the manufacturing trade balance has an adverse effect on the domestic economy's performance which may develop into a 'vicious circle of cumulative causation' that may take the form of an inflation-depreciation spiral.

The cumulative fall in competitiveness and the resulting 'vicious circle' will be amplified as other

countries are experiencing a 'virtuous circle'. Thus, high rates of foreign demand result in high rates of foreign investment, transformation and technical change. The consequent rise in efficiency, coupled with the ability for flexible reorganization in response to changing market conditions, increases the growth of foreign net exports and thus the rate of domestic market penetration. A fundamental feature of this process rests on the fact that the 'vicious circle' results from developments initiated elsewhere in the world system. The need, therefore, to expand and keep the pace in the process of structural transformation, technical change and production flexibility and thus maintain competitiveness appears more stringent in the presence of foreign trade. Thus, the dynamics of the world economy, as regulated by the free operation of the market, are characterized by the operation of dynamic economies to scale. Technology is continuously being developed but is not universally accessible, so technical progress unfolds as an evolutionary and cumulative learning process, characterizing different economic constellations in different degrees. The dynamics of effective demand domestically and on a world scale determines the dynamics of the system. Any given 'competitive advantage' in terms of growth, transformation and technical change, is only relative and tends to be compounded through the interdependence that exists among countries via foreign trade.

The tendency towards unequal growth entails a 'deflationary bias' and an intrinsic progressive instability in the dynamics of the world economy. As the growth of weak, less efficient and less flexible, countries is held back, the overall expansion of the world economy tends to slow down. The tendency is normally offset by the faster growth of strong, more efficient and flexibly organized, countries which actually enables weak countries to grow faster than would have otherwise been the case. This, however, causes a deterioration in the terms of trade of the less developed countries. The resulting long-run deflationary tendency, inherent in the dynamics of the system, remains as it were 'disguised' in the very process of expansion. The inherent and progressive instability of the dynamics of the world economy and the consequent patterns of uneven growth make for the cross country differentials in competitiveness to grow wider over time.

In conditions of international instability, the tendency for uneven growth results in the experience by the weak countries of fundamental 'disequilibrium' constraint in the balance of payments (Singh, 1986; Sacks, 1985; Williamson, 1985; Banuri (ed), 1991). In these circumstances, an exogenous 'deflationary shock', a slowdown in the expansion of the advanced and more efficient countries or a massive outflow of capital with a simultaneous reduction in the inflow transfers would make the constraint binding. The extent of the effect will depend on the differences between structural and initial conditions (e.g. structure of foreign debt), the differences in economic development models followed (e.g. export-promotion vs import-substitution strategies), and the differences in the size of the exogenous shock experienced (e.g. 'contagion' effects). But, even in the absence of any such adverse effects the tendency towards fundamental disequilibria will materialize. As long as the loss of weak countries' competitiveness is left to 'look after

itself', following the dictates of certain economic policies, it will eventually becomes cumulative.

A general slowdown in the expansion process could be avoided by enabling weak, 'structural-deficit' countries to grow at rates higher than their respective balance of payments equilibrium rates. This means effectively allowing them to run continuous current account deficits. Current policies, on the contrary, aim at leaving the burden of adjustment to bear upon the weak countries themselves by forcing them to 'live within their means'. In such a case, a generalized contraction of effective demand would ensue. A lower growth of effective demand in weak countries would spread from country to country through the foreign trade multiplier. In this way a generalized deflationary process would set in. As a long-run consequence, the differentials in competitiveness, inherent in the normal dynamics of the world economy as is regulated by the free operation of the markets, will be progressively increased. This will reinforce the tendency for unequal growth, structural transformation and technical progress. Depending upon the structure of the economy, at any one time the structure of net exports reflects the process of development in terms of dynamic economies to scale, learning and technical change. At the same time, it determines the potential for market expansion and opportunity for efficiency of the existing technological opportunities.

A 'representative' underdeveloped country is characterized by a low degree of mechanization, by a lack of inter- and intra-industry diversification and specialization and by a low degree of intersectoral interdependence. Underdevelopment is described in terms of the market-induced structural inability to realize increasing returns and, therefore, give rise to circular processes of cumulative expansion. Production processes are characterized by a very low intensity in skills, knowledge and technical change which result in the absence of induce learning. The export composition appears basically centered on primary commodities and a 'few' matured manufactured products for which the growth of demand tends to be rather low and unstable while the opportunity for efficiency is practically nil.

Thus, in the normal operation of the markets the pattern of specialization as between advanced and poor countries tends to be perpetuated and the corresponding differentials in efficiency tend to grow wider over time. Due to the operation of the dynamic economies to scale, industrial activities tend to concentrate in a few 'established centers' which benefit from the 'freeing' and 'widening' of the markets at the expense of the industrial development of 'backward' countries; 'the free play of market forces works toward inequality' (Myrdal, 1957).

8. Conclusions

Industrial growth is the result of productive transformations, in conditions of continual technical change, during a process of reciprocal causation. Thus, economic growth may be understood as a

continuous process in which economic forces interact upon one another in a cumulative way. The transformations are carried out through the existence of propagation mechanisms which are endogenously set at work. The outcomes of their operation reflect the mutual and self-reinforcing interaction of institutional, organizational and technological forces. Changes in market conditions induce economic reorganization which favors the introduction of new technology and this, in turn, further influences the market conditions, thus inducing further reorganization and so on. Thus, changes in one direction induce supporting changes which push the system further away from its initial position. During the process of continuous interaction, changes in competition, technical change and the growth and composition of overall demand determine the system's further expansion and structural transformation on a local and global scale. The ensuing changes in the volume of production then cause internal division of labor and this raises total macroeconomic efficiency. As a result, further technical innovation is induced and thereby further division of labor follows. The transformation of the system is well under way and depenmding on whether there is a relatively continuous feeding on the process of growth and structural transformation, the economy may alternatively progress or stagnate. If growth sets well in, the economy developes horizontally and vertically overcoming more and more easily the reappearing internal and external constraints and securing near full employment macroeoconomic internal and external balances. If, instead, a 'vicious circle' gets established, the system falls into a long term trap of gradual slow down in production, endemic unemployment and persistent macroeconomic internal and external deficits. Eventually standards of living fall, production falls further, structural transformations are retarded and underdevelopment appears.

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