

A VIEW FROM THE TROPICS: CELSO FURTADO AND THE THEORY OF ECONOMIC DEVELOPMENT IN THE 1950S

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Resumo: O artigo mostra como a interpretação do desenvolvimento econômico por Celso Furtado na década de 1950 está relacionada às demais contribuições formuladas por outros autores no período. Foi durante os anos 1950 que a teoria do desenvolvimento se estabeleceu como nova área de pesquisa em economia, com vários trabalhos seminais. Os escritos de Furtado são comparados ao tratamento histórico do “atraso econômico” por Gerschenkron, ao modelo da “economia dual” de Lewis, ao conceito de “sistema centro-periferia” de Prebisch, e à abordagem de “crescimento equilibrado” de Rosenstein-Rodan e Nurkse. A aplicação do modelo de Harrod-Domar por Furtado e outros ao “mecanismo de desenvolvimento” e ao planejamento econômico também é discutida.

Palavras-chave: Celso Furtado, teoria do desenvolvimento econômico, abordagem histórica, economia dual, sistema centro-periferia, crescimento equilibrado

Abstract: The paper shows how Celso Furtado’s interpretation of economic development in the 1950s is related to contributions made at the time by other development economists. Those were the years of “high development theory”, when a set of seminal papers established the theory of economic development as new field of research. Furtado’s writings are compared to Gerschenkron’s historical treatment of “economic backwardness”, Lewis’s model of the “dual economy” Prebisch’s concept of the “center-periphery system”, and the “balanced growth” approach of Rosenstein-Rodan (1943, 1961) and Nurkse (1951, 1953). It also discusses Furtado’s application of the Harrod-Domar model to the “mechanism of development” and to economic planning.

Key-words: Celso Furtado, theory of economic development, historical approach, dual economy, centre-periphery system, balanced growth

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1. Introduction

During the 1950s the economic development of less developed countries became a major focus of economic policy and theory. Those were the years of "high development theory" (Krugman 1993, p. 16; see also Arndt 1987, chapter 3), when a set of ideas put forward by a relatively small group of economists - many of them with links with international organizations such as the United Nations - established development economics as a new field. The "pioneers in development" (see the two volumes with that title edited for the World Bank by Meier and Seers 1984 and Meier 1987) included, among others, Paul Rosenstein-Rodan, Raul Prebisch, Ragnar Nurkse, Arthur Lewis, Albert Hirschman, Walt Rostow, Alexander Gerschenkron, Paul Baran, Hans Singer and the Brazilian economist Celso Furtado. The present paper shows how Furtado's interpretation of economic development and underdevelopment as interdependent phenomena is related to contributions made at the time by other development economists, especially Gerschenkron's (1952) historical discussion of "economic backwardness", Lewis's (1954) model of the "dual economy" and surplus labor, Prebisch's (1949) concept of the "center-periphery system", and the "balanced growth" approach of Rosenstein-Rodan (1943, 1961) and Nurkse (1951, 1953). It also discusses how the overall emphasis by the contemporary literature on development as a process of economic growth led by capital accumulation was reflected in Furtado's application of the Harrod-Domar economic growth model to the "mechanism of development" and to economic planning. In particular, planning was regarded by Furtado as the only way to overcome the defining feature of underdeveloped economies as distinguished from developed ones, that is, technological heterogeneity and underemployment associated with capital scarcity.

From 1950 to 1957 Celso Furtado (b. 1920; d. 2004; see Boianovsky 2008 for background information on his life and work) was head of the development division of the United Nations Commission for Latin America (ECLA; known as CEPAL in Latin American countries), directed by the Argentinean economist Raul Prebisch. His first piece on economic development theory was published in 1952, as a critical reaction to lectures delivered by Nurkse in Rio in 1951 (see Nurkse 1951). An English version of Furtado's article came out two years later in the *International Economic Papers*, and was reprinted in the well-known volume of readings edited by Agarwala and Singh (1958). Most of Furtado's (1954) first book - about development theory and the economic history of Brazil - was later incorporated into his two main works ([1959] 1963; [1961] 1964), both available in English (see Szmrecsanyi 2005 for a brief

overview of Furtado's contributions to development economics from the 1950s to the 1990s).

In his classic 1959 volume, written during the academic year he spent in Cambridge in 1957-58 after leaving ECLA, the structuralist approach was applied for the first time to the interpretation of the economic history of a Latin American country. The 1961 book on economic development collected essays written during the 1950s, including a shortened and revised version of the 1952 article as chapter 2. With some exceptions, it contained his main contributions to the field at the time. The main exceptions are Furtado's (1958a, 1961) comment on Rosenstein-Rodan's (1961) theory of the "big push" presented to the International Economic Association conference on "Economic Development for Latin America" held in Rio in 1957, and an essay in Portuguese on "marginalist analysis and the theory of underdevelopment" contributed by Furtado (1957; published also in Spanish, 1956a) to the Festschrift for the Brazilian economist Eugenio Gudin. The Festschrift included papers by foreign economists that had lectured on development economics in Rio throughout the 1950s under Gudin's invitation, such as Jacob Viner, Gottfried Haberler, Hans Singer, Lionel Robbins and Ragnar Nurkse. Also excluded from the 1961 volume are Furtado's extensive contributions to the methodology of economic planning, which may be found in an anonymous study made for ECLA (1953, revised 1955). I shall also refer to Furtado's books (all in Portuguese, with French translations) written during his period (1965-1985) as professor of development economics at the Sorbonne: *The Theory and Policy of Economic Development* (1967; an extended and updated version of his 1961 collection), *The Myth of Economic Development* (1974) and *Brief Introduction to Development* (1980). Another important source is Furtado's 1985 (in Portuguese, with French translation) autobiographical volume with recollections of his experience as a development economist in the 1950s.

2. The historical approach to economic development

As stated in his 1987 World Bank lecture, Furtado's methodological starting-point was that only through careful historical investigation, instead of formal growth models, one could understand underdevelopment phenomenon.

Why have countries that emerged as a result of the economic expansion of Europe - and that were organized to facilitate that expansion - lagged so far behind in their development? This question is at the heart of my thinking about underdevelopment. The theory of growth that blossomed immediately after World War II was a conventional dynamization of macroeconomic models... But inquiry into the reasons for backwardness is meaningful only in the historical context, which demands a different theoretical approach (1987, p. 205).

Furtado, however, was at pains to emphasize that the economist should not limit itself to a "mere description of historic cases of development" (1954, p. 213; [1961] 1964, p. 4). Analytical tools are necessary in order to interpret the connection between the main variables. The theory of economic development moves on two planes: first, abstract formulations of the "actual mechanism of the process of growth" based on models with stable relationships, followed by their application to historic realities (1954, p. 211; [1961] 1964, p. 1). The role of historical investigation in development theory comes from acknowledging the "irreversibility of the historic economic process" that makes it

impossible to eliminate the time factor, and the “structural differences of economies in different states of development” ([1961] 1964, p. 2).

Of course, Furtado was not the only economist at the time to adopt a historical perspective in interpreting economic backwardness. In his well-known essay, Gerschenkron (1952) advanced the hypothesis that the level of development reached by a particular country - called “relative economic backwardness” by him - decides the characteristics of its industrialization process. The “advantage of backwardness” became the centerpiece of Gerschenkron’s interpretation of late industrialization of continental European countries (see Dawidoff 2002, ch. 6; Crafts 2001). Backward countries tend to borrow modern techniques of production from advanced countries, and to search for “substitutes for prerequisites” for the productive factors, internal demand or institutions they lack. The patterns of substitution for prerequisites were interpreted as responses to economic backwardness at the start of the industrialization process, with the implication that late-comers will grow faster than the pioneers did at earlier stages and eventually catch up.

Gerschenkron never applied his hypothesis to Latin American and other tropical countries, and, with the exception of his former Harvard colleague Albert Hirschman (1968; 1981, ch. 1), was rarely mentioned in discussions about Latin American industrialization (see Gootenberg 2001). Furtado (1974, p. 22, n. 7) referred to Gerschenkron’s 1952 “classic work” only once, in connection with the specific institutional aspects of late industrialization in Europe, such as the role of the banking system and of the state as substitutes for entrepreneurship and private capital market respectively. However, it is likely that Furtado came across Gerschenkron’s essay much earlier. Indeed, Furtado (1985, pp. 89-95) reports in his autobiography an American tour he made in the spring of 1951 to get to know the state of research on development economics at universities in Cambridge (Mass.) and Chicago. Gerschenkron is not mentioned among the economists Furtado met during his tour (the list includes Leontief, Rostow, Charles Kindleberger, Bert Hoselitz, Melville Herskovits, Theodore Schultz and E. J. Hamilton), but Furtado (p. 89) did refer to the interdisciplinary seminar about economic development that took place in June 18-21 1951 at the University of Chicago, where Gerschenkron’s essay was first presented. Although Furtado is not listed among the participants (see Hoselitz 1952, pp. 287-88), he probably attended the seminar, since he was still in the United States by 29 June 1951, when he got a letter from an economist from Duke University (the letter is not signed) calling his attention to Nurkse’s lectures scheduled for July of that year in Rio. In any event, Furtado was certainly aware of the Chicago 1951 seminar (or of the 1952 published proceedings), which he mentioned in his 1952 reaction to Nurkse.

The theory of economic development in its general form does not fall within the categories of economic analysis. This is a point of view fairly widely accepted nowadays, and it should hardly be necessary to refer to the seminar on Economic Development held at the University of Chicago in 1951, at which sociologists, anthropologists and historians sat side by side with economists. Economic analysis cannot say why any society starts developing and to what social agents this process is due. Nevertheless it can describe the mechanism of economic development and it is this description which we now propose to discuss (Furtado [1952] 1954, p. 129; [1961] 1964, p. 60).

As recalled by Furtado (1985, pp. 90-91), his meeting with Rostow at the MIT in 1951 was less than successful. Rostow gave him a copy of the typescript of *The Process of Economic Growth* (1952), which contained the basic elements of the proposition that

the economic development of different countries historically goes through a succession of phases to which a single analytical framework can be applied, fully elaborated later in Rostow's 1960 book. As pointed out by Furtado (p. 91), Rostow's thesis was the opposite of Furtado's view that differences rather than similarities should be stressed in the historical investigation of the process of industrialization. Hence, "Rostow showed no interest in what I was concerned about", that is, the specific features of the modernization process in underdeveloped countries. Like Gerschenkron, Furtado ([1967] 1975, ch. 10) would reject Rostow's framework that backward countries historically tend to reproduce the development pattern of the first-comers.

The main aspects of Furtado's historical approach to economic development were established already in his 1950 article about the "General Characteristics of the Brazilian Economy", before he came to know of Gerschenkron 1952. Differently from Gerschenkron's interpretation of European industrialization in the late 19th century, Furtado argued that the industrialization process of Brazil and other Latin American economies in the 1930s and after could only be understood in the context of the historical evolution of the international economic system. The economic history of tropical countries must be based on an open growth model with international trade treated as an endogenous variable, since these countries' economies evolved as suppliers of raw materials to the world market. Furtado ([1952] 1954, p. 129) distinguished sharply between the economic growth process in developed and underdeveloped economies. In both cases the process of development involves the increase of labor productivity through new combinations of factors or introduction of technical innovations. However, whereas the growth of a developed economy is "mainly a problem of accumulation of new scientific knowledge and progress in the application of that knowledge", the increase of productivity in underdeveloped economies results from the simple introduction of techniques which are already known, that is, it is "above all a process of assimilation of the techniques existing at the time". The notion that underdeveloped economies adopt the modern technology made available in developed countries and, therefore, do not go through the same historical stages, was often pointed out by Furtado (see e.g. the ECLA 1955 document on economic planning, p. 16, drafted by a team under Furtado's direction). In contrast with Gerschenkron, this apparent "advantage of backwardness" was seen as problematic by Furtado because of its implications for income distribution and employment, and therefore for the convergence process, as discussed in section 5.

The low productivity levels typical of very backward economies mean that most of their income is spent on the satisfaction of elementary consumption needs. The introduction of modern techniques from abroad generally calls for an increase in capital supply, which is lacking in such economies. Hence, a backward community has the tendency to remain stagnant, unless it is affected by an initial impulse coming from outside, as has historically been the case.

In certain circumstances it is possible to introduce more productive combinations without increasing the amount of capital available, provided it is possible to integrate the economy in question into a wider market. The opening of foreign trade will allow the economy to make a fuller and more rational use of those factors which are available to it in relative abundance, i.e. land and labor. By obtaining larger quantities of goods than would be possible if production were only for the home market, the economy will have increased its productivity. The increase in real income thus obtained will provide the necessary margin to enable the process of capital accumulation to begin ([1952] 1954, pp. 131-32; [1961] 1964, p. 64).

International trade, from that perspective, may be regarded as a “substitute for prerequisites” in Gerschenkron’s sense. The increase in productivity and income brings about diversification of demand, at first met largely by imports. This corresponds to the first phase of the economic development of tropical countries, which lasted until the 1920s. With the sharp decline in external demand and prices of exported goods following the great depression of the 1930s, the change in relative prices spurred an increase in the demand for domestically produced manufactured goods, which marks the start of the phase of import-substituting industrialization. The industrialization process is thus a matter of replacement of imports, which means that the driving force is the previously existing demand created by external induction. This is in contrast with developed industrial economies, where the dynamic element is represented by technical change in the productive process. Therefore, according to Furtado ([1961] 1964, pp. 135-38), whereas the economic development of the industrially advanced countries had been based on an internal supply-side dynamics, the development of tropical backward countries was induced from without and determined by the demand side (see also Hunt 1989, pp. 123-28). Furthermore, the import-substituting industrialization process led entrepreneurs to adopt technologies compatible with a cost and price structure similar to that prevailing abroad.

The upshot is that “underdevelopment is not a necessary stage in the process of formation of the modern capitalist economies”. Rather, it is a “special process due to the penetration of modern capitalistic enterprises into archaic structures”. It is a specific phenomenon that “calls for an effort of autonomous theorization” (Furtado [1961] 1964, pp. 138-39). This is different from the late European industrialization examined by Gerschenkron, since, once “relative backwardness” reaches a certain point, the industrialization process changes qualitatively: it is no longer a matter of building a national economic system but becoming part of the international economy (Furtado, 1974, p. 23). In contrast with the industrialization of European countries in the second half of the 19th century, the import-substitution process in Latin America - based on consumption goods demand - did not lead to the verticalization of the productive structure through the intensive development of producer goods industries and changes in international trade (exports of manufactured goods and imports of raw materials). The evolution of trade patterns in Latin American countries after the 1930s was quite the opposite: exports were still based on a few commodities and imports concentrated on goods whose production required huge investments and/or advanced technology (Furtado 1980, p. 130; see also Hirschman 1968, pp. 8-9).

3. Trade and growth

Furtado’s view that economic development and underdevelopment are interdependent phenomena is consistent with the concept of the center-periphery system advanced by Prebisch (1949) at ECLA, although the Brazilian economist paid much more attention to the historical dimension of the relation between developed and underdeveloped (called “dependent” instead of “peripheral”) economies than Prebisch had done. Prebisch’s ECLA document on “The economic development of Latin America and its principal problems” was translated from the Spanish original into Portuguese by Furtado and published in *Revista Brasileira de Economia* in September 1949, together with another study by the UN (written anonymously by Singer) about the secular trend in the terms of trade. It was after the publication of that article in the Brazilian journal

that Prebisch's influence spread worldwide (Toye and Toye 2003, p. 458), especially his claim that the terms of trade between primary products and manufactures had been subject to a long-run downward trend. However, the Prebisch-Singer thesis of secular fall in the terms of trade and its implication that - against the pure theory of international trade - there is no equalization of factor prices, did not play a prominent role in Furtado's historical analysis of the growth dynamic in the center and periphery (see Hunt 1989, p. 133) or in his theoretical interpretation of underdevelopment (see also Bielschowsky 1988, p. 163). The secular fall in the terms of trade was mentioned at the outset of Furtado (1950), but was conspicuously absent from his two main books (1954, [1959] 1963) about Brazilian economic history and from his [1961] 1964 volume on development economics. In the concluding section of his comments at the 1957 IEA conference, Furtado pointed out that

It is essential to recognize that the mere existence of economies with widely different degrees of development, although all of them in process of growth, constitutes in itself a vitally important topic for study. It is not enough to acknowledge that international trade alone does not help to reduce inequalities in the remuneration of the factors. It must be determined in what conditions the expansion of a stationary economy's foreign trade can initiate a process of economic growth capable of generating its own momentum (Furtado 1958a, p. 125; 1961, p. 73).

Indeed, Furtado's ([1952] 1954) rejected Nurkse's (1951) view that, due to the small size of their markets and the indivisibilities of modern production methods, underdeveloped economies faced a "vicious circle of poverty" which could be only broken by inducing investment through a "balanced growth" strategy. While agreeing with Nurkse's demand approach to economic development, Furtado ([1952] 1954, p. 126) argued that the lack of investment incentives depends on the specific assumption made about the dynamics of the external market. Nurkse's argument applied to backward economies with stagnant demand for exports, called "stagnation at a low development level" by Furtado ([1967] 1975, ch. 20). It did not apply to backward economies that had previously gone through a period of productivity growth caused by international trade. In this situation, the effect of a long and deep stagnation in trade is to bring about "structural tensions" that open the way to import-substitution industrialization. This may be described as a case of "unbalanced growth", since the disequilibria between the configuration of demand and the structure of supply produce concentration of investments in a few sectors, accompanied by a change in the shape of imports ([1967] 1975, pp. 279-80; cf. Hirschman 1958).

Furtado's conjecture that international trade increases productivity through its positive impact on the absorption of resources that otherwise would remain idle is very close to Myint's (1958) concept of the "vent for surplus" theory of international trade. It differs from the Ricardian comparative-costs theory insofar as its emphasis is not on the increase of efficiency through reallocation of resources in a full-employment economy, but on the effects of trade in providing effective demand for the output of surplus resources. Just like Myint, Furtado ([1961] 1964, pp. 64-65) associated the vent for surplus theory to Adam Smith's proposition that the division of labor is limited by the size of the market. Apart from the quotation from his 1952 article given in section 2, another relevant passage may be found in Furtado's historical account of the Brazilian economy before the great depression of the 1930s (which he called "colonial economy"):

Permitting better utilization of the resources of the soil and preexisting manpower supply, the external impulse creates the increase in productivity which is the starting point for the capital accumulation process. The mass of wages and other payments to factors created in the export sector represents the embryo of the domestic market. When the external impulse grows, indirect expansion of internal demand tends to integrate into the monetary economy those manpower and soil resources that had been underemployed in the subsistence sector (Furtado [1959] 1963, pp. 220-21; also in Furtado 1954, pp. 141-42).

Depending on the price elasticity of demand for exports, the positive effects on income of an increase in the physical productivity of labor may be wiped out by the market mechanism. If the demand schedule is inelastic - as usually assumed by ECLA at the time - the benefit of a productivity increase in the export sector may be completely transferred abroad by a fall in the terms of trade. Furtado ([1952] 1954, p. 132) referred to those circumstances as "special cases" and assumed that "real income closely follows the movement of the average physical productivity of labor". Sometimes he accepted the demand inelasticity assumption, but contended that the positive nexus between trade expansion and growth could be still maintained by generalizing the Brazilian historical experience of maintaining the coffee price through a policy of artificial control of coffee supply ([1967] 1975, p. 198, n. 2; [1959] 1963, ch. 31; 1954, ch. 4).

Furtado generally stressed cyclical changes in the terms of trade, instead of its secular trend. In a "colonial economy", characterized by the determination of its level of activity by export demand, the cyclical decline of the external impulse results in contraction of monetary income and ensuing underutilization of capacity and underemployment in the sector connected with the domestic market. However, the pattern of propagation of depressions - originated by cyclical falls in the exports sector - tends to change after the economy reaches a certain degree of diversification of its productive structure. Through a combination of several factors - such as exchange rate depreciation, fiscal deficit and accumulation of stocks of primary commodities through internal funding - domestic demand does not collapse when external demand shrinks, which leads to higher relative prices of domestic industrial goods. Hence, in contrast with the "colonial economy", a fall in external demand is accompanied by increasing industrial production in the second (import-substitution) phase of the industrialization process started in the 1930s, when trade ceased to act as an "engine of growth" (Furtado [1967] 1975, chapters 16 and 17; 1954, ch. 4; 1950).

The main obstacle to economic growth posed by the external sector is not represented by hypothetical secular falling terms of trade, but by restrictions to the capacity to import caused by changes in the economic structure. Anticipating some elements of the two-gap model later developed by Chenery and Bruno (1962), Furtado (1958c) showed in a two-sector model featuring a modern and a backward sector how balance of payment disequilibrium could constraint the economic growth process under the assumption that the coefficient of imports in the investment sector is larger than in the consumption sector, as is typically the case in underdeveloped countries. Such chronic disequilibrium has structural (not monetary) causes and may lead to the "strangulation" of economic growth.

Although dedicated to Prebisch, Furtado's 1954 book was not well received at ECLA, since it conflicted with its general anonymity rule (Furtado 1985, p. 183). Prebisch's reaction was cool (see Mallorquin 2005, pp. 52 and 59); in a memorandum of 26 August 1954 he asked Furtado to clarify the relation between exports growth and

increasing productivity, which defied some elements of the falling terms of trade thesis. Eventually Furtado ([1967] 1975, chapters 16 and 18) came to the conclusion that the crux of the center-periphery system was not the declining terms of trade issue, but the asymmetric pattern of international trade expressed by the concept of “dependence”.

By referring to *products* instead of countries, the controversy around the issue of the long-term behavior of the terms of trade between raw-materials and manufactured goods has overlooked the phenomenon of dependence and diverted attention to a set of false problems that have occupied the center of attention ([1967] 1975, p. 233; italics in the original).

The theme of dependence theory had often come up in Furtado writings in the 1950s (see e.g. his 1956b book about the Brazilian economy titled *A dependent economy*), but it would not be fully elaborated until the early 1970s (1971; 1974, ch. 3). Furtado argued that underdeveloped economies feature cultural dependence, that is, consumption patterns are historically transplanted from developed countries by the upper strata of the underdeveloped areas as a result of their appropriation of the economic surplus generated through foreign trade. Such modernized component of consumption brings dependence into the technological realm by making it part of the production structure through the import-substitution industrialization process. This has deep consequences for the growth dynamics of underdeveloped economies, as discussed further in section 5.

4. Capital accumulation and technical change

One of the main features of the development literature of the 1950s is what Richard Easterly (2001, p. 47) has called “capital fundamentalism”, that is, the notion that physical capital accumulation, instead of technical change or investment in human capital, determines the rate of growth of income per capita. This was reflected in the widespread application of the Harrod-Domar model (especially in the Domar version) to economic planning and to the interpretation of the “economic development mechanism” (see e.g. Singer [1952] 1958 and Bruton [1955] 1958). As pointed out by Easterly, “capital fundamentalism” resulted from the double assumption of surplus labor and absence of diminishing returns to capital. While the former assumption was often explicitly made (see e.g. Lewis 1954), the latter was generally implicit, at least until Solow’s (1956) neoclassical growth model.

Furtado was no exception to the emphasis on capital accumulation by development economists in the 1950s. However, it should be noted that he clearly distinguished between growth processes in developed and underdeveloped countries as far as the role of capital is concerned. Technical progress, instead of investment in physical capital, was perceived as the main source of growth in advanced economies.

The development of the more advanced industrial economies over the last three-quarters of a century very particularly reflects the progress of technique. Capital formation, although it has been the main vehicle of the assimilation of new techniques, is in itself responsible for only a relatively small fraction of the increase in the productivity of labor... In the historical context of today the effect of the assimilation of a technical innovation on the rate of growth is a function of the degree of development. The more highly developed an economy is, the greater is the positive effect of the assimilation of a technical innovation. In

other words, development depends increasingly upon technique and less on direct capital formation in the productive process (Furtado 1958a, pp. 123-24; 1961, p. 72; see also 1980, pp. 58 and 63).

Furtado presented those comments to the IEA conference in Rio in August 1957, the same month Solow's empirical paper about the pivotal role of technical progress – instead of capital accumulation – in economic growth came out. He may have been influenced by Solow 1957, but this is unlikely. The puzzle that excited Furtado's mind at the time was to explain why underdeveloped economies (like Brazil), with a net investment rate in 1950 similar to that registered for developed economies (like the US) in 1875, accompanied by a much more advanced technique than in 1875, had not attained a rate of growth higher than that of the US in the last quarter of the 19th century. Part of the explanation was the fact that the progress of technique had made necessary a greater concentration of resources, in the sense that the technology adopted by underdeveloped countries did not reflect their relative supply of factors. The assimilation of new technology may have little impact on the average labor productivity if there is no alternative means of employing the workers released in backward economies. "In other words, the marginal physical productivity of specific sectors such as manufacturing may substantially increase without any improvement in the average productivity of the system as a whole" (ibid).

Technological heterogeneity (meaning different degrees of technical development in the economic sectors) with a low margin of factor substitutability is a feature of economies with capital scarcity, as it happened in Great Britain when classical economic thought prevailed at the start of the 19th century. In that case, the simple reallocation of workers between sectors leads to higher average productivity. However, this depends on the availability of the relatively scarce factor (capital), as stressed by classical economists (Furtado 1957, p. 167). The development of the marginalist approach to production theory at the end of the 19th century corresponded, according to Furtado (pp. 169-70), to different historical circumstances in the advanced economies, when they turned into homogeneous technological systems in which the movement of workers from one sector to another could not bring about anymore a substantial productivity increase. From that point on, wages are not decided by the subsistence level of workers, but by their marginal productivity. In this full-employment neoclassical framework, capital accumulation at a higher rate than population growth will bring about a persistent fall in the marginal productivity of capital until eventual stagnation because of diminishing returns (ibid; see also Furtado 1954, p. 224). Historically, diminishing returns to capital have been counteracted by the compensating effect of the introduction of labor-saving technology in advanced economies, which explains why the productivity of capital (as measured by the output-capital ratio) has been stable in the long-run (Furtado 1957, pp. 170-71; ECLA 1955, p. 15, n. 5).

Although Furtado did not refer to Solow (1956, 1957) in his 1961 *Development and Underdevelopment*, the notion of diminishing returns is implicit in his remark that "undoubtedly without technological progress [capital] accumulation would soon attain its limits" ([1961] 1964, p. 69). Furtado ([1967] 1975, p. 119, n. 3) appended an illuminating footnote about diminishing returns to capital to the corresponding passage in his *Theory and Policy of Economic Development*, where he assumed that diminishing returns would set in the moment the more advanced technology is fully spread to all sectors of the economy. Solow's model was extensively discussed in Furtado ([1967] 1975, pp. 64-76). Under the assumption, usually associated with the Harrod-Domar model, of given output-capital and labor-capital ratios, the growth process may be

interpreted in terms of a single production factor (capital). The alternative assumption of a margin of substitution between capital and labor makes it clear that “it is impossible to base the growth of income per capita on capital accumulation alone” (p. 71), which brings technical progress into the picture. Furtado came back to that in his *Brief Introduction to Development*: backward economies, where advanced techniques have not spread to all sectors, are able to undergo substantial capital accumulation before diminishing returns sets in (Furtado 1980, p. 58).

As recalled by Furtado (1985, p. 131), the starting-point of ECLA’s approach to economic planning in Latin America in the 1950s was the existence of a “structural” permanent excess supply of labor because of capital scarcity and technological heterogeneity. Hence, economic development policy should not aim at the full-employment of the labor force, but at the steady increase of its average productivity as determined by the rate of investment and by the output-capital ratio. Domar’s (1946) classic paper was a main influence, but instead of the “parametric” role played by the rate of investment and the output-capital ratio in Domar’s original formulation, Furtado treated them as “instrumental variables” in Tinbergen’s sense. “We did make use of variables similar to Domar’s, but we reached them through a different route and in search for other objectives” (ibid, p. 134). In his summing up of Latin American economic planning experiments, Furtado ([1969] 1970, ch. 22) explained that macroeconomic projections were based on hypotheses concerning the evolution of the average productivity of capital expressed by the output-capital ratio, which was measured by the first time by Furtado’s team at ECLA in the early 1950s. The output-capital ratio was interpreted by Furtado as a variable that encapsulated the influence of the several factors that affect the productivity of the economy. That ratio was, therefore, seen as positively dependent on the abundance of fertile land, on the learning skills of the labor force, on the infrastructure of the economy (especially transportation and power supply), and on the use, due to an increase in exports, of hitherto idle resources (Furtado [1952] 1954, p. 135; 1958b, ch. 5; ECLA 1955, pp. 42-43). Skilled labor was perceived as a scarce factor, but it was held that the improvement of the human factor could only be achieved through investment and, therefore, was also dependent on the availability of capital (see Furtado 1958b, ch. 5; [1969] 1970, p. 207, n. 2).

Furtado ([1952] 1954, pp. 137-38; [1961] 1964, pp. 72-74) also made use of the Domar model to discuss the process of acceleration of growth - that is, what Rosenstein-Rodan (1961) would later call the “big push” - in hitherto stagnant backward economies when the rate of investment increases to a certain level (10%), under the assumption of a given output-capital ratio (0.5). This increase is historically associated to external factors such as the inflow of capital and techniques, the influence of external demand or substantial improvement in the terms of trade ([1952] 1954, p. 137, n. 11). The impact of these factors on the rate of growth depends on the form of appropriation and utilization of the economic surplus (in the classical sense) yielded by trade, as pointed out by Furtado (1955; [1961] 1964, ch. 3) in his detailed historical investigation of the connection between the process of development and the use of surplus in advanced and backward economies. The economic surplus concept was also central to Paul Baran’s well-known 1957 book, published a couple of years after Furtado’s 1955 essay (see Furtado 1985, p. 178; the analytical role of the economic surplus had not been mentioned in Baran 1952). According to Furtado (1958a, pp. 122-23; 1961, p. 71), if the impulse provided by external factors is sustained, a substantial change may take place in the structure of demand. Insofar as the domestic supply keeps pace with these changes, “possession of the surplus will inevitably be transferred from the traditional

landowner class to the commercial and industrial entrepreneurial class”, with profound implications for economic growth.

As first generation entrepreneurial classes have a high propensity to save, the concentration of part of the surplus in their hands will be conducive to a considerable increase in reproductive investment. It is thus perfectly possible that the resources required for the big push may be accumulated within a relatively short period... What is important to emphasize is that a formerly stationary economy can in a few years reach a net investment of up to 10% with its own resources, provided the way in which the surplus is utilized is fundamentally altered. It is true that these changes do not come about gradually but relatively abruptly, as the accumulation of resources in the hands of the entrepreneurial class increases much more rapidly than consumer expenditure (1958a, p. 123; 1961, p. 71).

The numerical exercise carried out by Furtado ([1952] 1954, p. 137; 1954, p. 207; [1961] 1964, p. 73) was designed to illustrate the mechanism of acceleration of the rate of growth under the assumption that consumption increases at a given rate (2.5%) lower than the rate of growth of income (5%, according to the Domar formula). Under these circumstances, the average propensity to consume will decline while the rate of investment will increase from 10% in the first year to 24% in the fifth year, which will allow the rate of annual growth of income to rise from 5% to 9.4% in the fifth year. If consumption had grown at the same rate as output, the rate of investment would have remained as 10% and the rate of growth would have remained steady at 5%.

However, as observed by Furtado (1954, pp. 207-08; [1961] 1964, pp. 73-74; [1967] 1975, pp. 125-26), this process of growth acceleration accompanied by a declining share of consumption in aggregate income is only feasible under the assumption that the original impulse comes from exports, since the surplus will be absorbed by investment in the expanding external sector. If output growth is to be absorbed by the internal market instead, there will be a “break” to the increase of the rate of investment. The existence of this “ceiling” to the rate of investment is explained by both physical - the increase of the average production period (in the Austrian sense of a higher amount of capital per consumption good produced) brings about diminishing returns and a fall in the marginal efficiency of investments - and economic reasons. The latter consists in the fact that consumption demand must provide a market for the increasing stock of capital goods. “For investment to proceed there must be a growth in consumption, and this requirement sets a ceiling on the proportion of the national product that a free enterprise economy can spontaneously invest. Once this ceiling is surpassed the rate of growth of consumption fails to provide incentives for new investment” (1954, p. 208; [1961] 1964, p. 74). Furtado is here close to the Malthusian theme of the “optimum propensity to consume” dear to the long underconsumption tradition in economics (see Lange 1938). As indicated by Maurice Dobb (1965, p. 461), Furtado advanced the notion that income distribution is a crucial factor in determining, through its influence on the structure of demand, whether development becomes a cumulative process or is interrupted because increase of capacity fails to be matched by an appropriate growth of demand. The connection between income distribution and demand was an important link in his interpretation of the obstacles to the development of dual underdeveloped economies once they start their industrialization process, as discussed next.

5. Economic dualism and underdevelopment

Furtado's study of the historical process of development by "external induction", with technology as an "independent variable" determined abroad, led him to define an underdeveloped structure as one in which "the full utilization of available capital is not a sufficient condition for complete absorption of the working force at a level of productivity corresponding to the technology prevailing in the dynamic sector of the economy" ([1961] 1964, p. 141; 1958b, p. 404). This structural definition has been largely accepted in the literature, instead of general definitions in terms of statistical indicators such as income per capita etc (see e.g. Hunt 1989, p. 49). It means that underdeveloped countries are not just backward, but hybrid systems with the prevalence of a technology that does not correspond to the pattern of the available factors of production. In broad terms, underdeveloped economies are formed by two sectors: the "nucleus", in which modern technology predominates (whether it produces for the external or the domestic market) and the backward sector, with a pre-capitalist structure. The degree of underdevelopment is a function of the relative importance of the backward sector, and the rate of growth of income per capita is determined by the pace of the increment in the relative importance of the modern sector. That pace depends upon the rate of investment, the nature of the technology adopted and the rate of population growth. The process of growth is thus essentially a transfer of labor from the backward to the developed sector, which implies an increase in the average labor productivity of the economy as a whole, regardless of the fact that productivity in both sectors remains unchanged.

The focus on underemployment as a crucial characteristic of underdevelopment was not unique to Furtado, but could be found in other development economists of the 1950s, like Rosenstein-Rodan, Nurkse and especially Lewis (see Hirschman 1981, pp. 7-8). Furtado ([1952] 1954, pp. 129-30, 139) had already distinguished in his 1952 paper between the long-term full-employment situation prevailing in developed countries and the structural underemployment typical of underdeveloped economies, caused by capital scarcity and technological heterogeneity. In the same vein, the notion of a perfectly elastic labor supply at subsistence wage came out as one of the results of his 1950 historical essay on the industrialization process of Brazil (see Love 1996, ch. 10; Furtado 1985, p. 68). Nevertheless, it was only after the publication of Lewis classic paper in 1954 that the full analytical implications of the unlimited labor supply assumption for the theory of development became clear. Lewis paper had an immediate impact on Furtado, who, in a bitter letter to his colleague Juan Noyola, regretted that ECLA economists had not been able to come up with a similar model.

I call your attention to Lewis's work... I regard it as the best single piece ever written about the theory of development. He follows exactly the same approach adopted by us in our preliminary studies for planning techniques. I am convinced that if we had not been discouraged to "theorize" at that stage, we would have been able to present two years ago the basic elements of a theory of development along the lines of this important contribution by Lewis. We are left with the fact that, having dedicated more time than any other person or group of people to think about and investigate in this field, we find ourselves today relatively behind and without anything of real significance to show for (letter from Furtado to Noyola, 22 February 1955).

In the following year Furtado reviewed in Portuguese Lewis 1955 *Theory of Economic Growth*. There were great expectations about Lewis's book after his 1954 formulation

of the theory of labor surplus, a “central piece of what we could call the theory of backward development”, with “strong affinities with ideas that have been elaborated by the ECLA team of economists since 1948” (Furtado 1956b, p. 52). However, the book was a big disappointment, since, instead of developing further his 1954 model, Lewis embarked upon a relatively loose description of the development process, full of pieces of “amateur sociology” (ibid).

Soon after his letter to Loyola, Furtado started working on a paper in which he referred to Lewis’s 1954 model to argue that the marginal productivity theory of wage determination does not apply to economic systems that display significant technological heterogeneity (Furtado 1956a, 1957). In those economies, the transfer of labor from the backward to the modern sector would bring the marginal productivity in the latter quickly to zero, and yet the average productivity would be higher than in the backward sector. From this point on, the labor transfer to the modern sector would bring about a decline in aggregate output, despite the fact that the capital-labor ratio is higher than in the traditional sector. This makes it impossible to equalize the marginal productivities of capital and of labor in the two sectors, and, therefore, precludes any relation between wages paid and marginal productivity in the modern sector. A way out would be the determination of wages in the latter by the marginal productivity in the backward sector, so that the modern sector would benefit from a quasi-rent. This solution, however, does not apply if the marginal productivity is zero or very close to zero, which brings in the Lewis model (Furtado 1957, pp. 168-69). Wages in the modern sector are decided by the subsistence level of the population employed in the backward sector; they are somewhat above that, so that labor supply to the modern sector is perfectly elastic.

Furtado (1957; [1961] 1964, ch. 4) suggested that the first phase of the Industrial Revolution in England had taken place under conditions of capital scarcity, constant real wage and entirely elastic labor supply, followed by a second phase of labor scarcity, growing real wages and ensuing labor saving technical change, especially in the capital goods industry. The same interpretation applied to the United States, which from many points of view formed a single economic system with England in the first half of the 19th century ([1961] 1964, p. 127). It is worth noting that Furtado (1957) did not discuss the second part of Lewis’s model, that is, the absorption of surplus labor by increasing investment in the capitalist sector financed by saving out of profits (quasi-rent), until the marginal productivity of labor in the backward sector rises to equality with the wage rate. He did apply that argument to the early stages of development in central industrial countries, but not to the peripheral underdeveloped economies, where dualism was deemed as a permanent characteristic. The reasons for Furtado’s skepticism about the full working of Lewis’s mechanism may be found towards the end of his 1957 (pp. 172-74) essay. Economic duality is associated with a highly concentrated income-distribution profile, which affects the level and structure of aggregate demand. The market for general consumption goods grow very slowly because of stationary real wages, which, in the absence of a strong external impulse, leads to stagnation. That proposition was further developed as part of Furtado’s ([1967] 1975, ch. 14) careful discussion of Lewis’s model. It is similar to Furtado’s remarks about the limits to a rising investment rate mentioned in section 4, with an additional factor represented by the negative impact of a lower output-capital ratio on the growth rate of the economy.

The explanatory value of [Lewis’s model] is restricted to the behavior of the capitalist sector under the assumption of growth based on external induction. In this case, the domestic income-distribution profile is not relevant for the growth process. Under a more general assumption, in which the domestic demand

profile is the main factor determining resource allocation, we may ask what will be the implications of the fact that demand growth takes place under a stagnant wage rate, that is, without consumption diversification by most of the population. The income concentration, which necessarily accompanies the kind of growth we are considering, brings with it a certain evolution of the demand profile characterized by an increasing dependence of external supply of consumption goods required by the higher income strata, and by an allocation of resources in the internal market that tends to increase the capital-labor ratio. Moreover, if we take into account that technical progress contributes to the increase of the capital-labor ratio, it is easy to understand that the labor surplus, instead of disappearing, tends to persist and, and in many cases, because of demographic growth, to increase ([1967] 1975, pp. 205-06).

Interestingly enough, Lewis (1954, pp. 153-54) did consider the Malthusian argument that the rate of profit may fall if capital is growing more rapidly than consumption, which could prevent the working of the absorption mechanism in the model. However, Lewis dismissed Malthus's argument on the grounds that - as Ricardo had argued against Malthus - the unlimited labor supply means that the capital-labor ratio, and therefore the rate of surplus, can remain constant for any amount of capital.

Furtado was probably the most conspicuous author in the Latin American underconsumption tradition (see Lustig 1980; and Simonsen 1963, pp. 41-42, for an early reaction). Eventually he came to the conclusion that, after the two earlier periods of economic growth - determined respectively by external trade and import-substitution - the Latin American countries had entered in the late 1960s a new dynamic path in which consumption demand by high-income groups could under conditions of income concentration become the leading factor of the system (Furtado 1974, ch. 3; see Taylor and Bacha 1976 for a formalization of the argument). The perverse relation between growth and income concentration, as well as the persistence of economic dualism and poverty in underdeveloped countries, led Furtado (1974, p. 97; see also 1987, pp. 223-26) to claim that the Lewis thesis - that the investment of the economic surplus in the industrial sector would eventually bring about an economic system with increasing homogeneity and real wages growing together with the average productivity of the economy - had been rejected by the facts.

6. Concluding remarks

Furtado's contributions to the theory of economic development in the 1950s should be seen against the background of the international intellectual context of the time. As head of the development division of ECLA he was from the beginning exposed to the Prebisch-Singer thesis of declining terms of trade and the center-periphery concept. He probably attended the Chicago 1951 seminar where Gerschenkron's essay was first presented. The seminal formulations of the balanced growth and big push ideas by Nurkse and Rosenstein-Rodan, respectively, were both originally presented in Rio in the 1950s, and on both occasions Furtado was the first economist to discuss them in print. Furtado also reacted to the Lewis model shortly after it came out. Like many other development economists at the time, Furtado used the Domar growth model as the backbone of his interpretation of the mechanism of economic development and of his work in economic planning, with emphasis on the effects on growth of changes in the investment rate and in the output-capital ratio.

Although influenced by these economists, Furtado's own contributions grew out of his critical assessment of their contributions to the interpretation of underdevelopment phenomena. These involved the relatively minor role (if any) of the Prebisch-Singer thesis in his historical account of the industrialization process in the periphery, the rejection of the applicability of Nurkse's Schumpeterian perspective to underdeveloped countries, the historical reformulation of Rosenstein-Rodan's big push, the view that the Domar model is relevant to underdeveloped economies provided specific assumptions are made about excess labor supply, capital scarcity and absence of diminishing returns to capital, and the proposition that the Lewis model neglects the demand side of the economy. Although Furtado had some important elements in common with Gerschenkron's historical approach to development, he did not share its convergence implications - that is, the view that the rate of growth of backward countries would speed up once they became industrialized, until their income per capita converges to the level of developed countries. As discussed above, Furtado suggested in the 1950s that the speed of technical progress is a positive function of the rate of accumulation, which would give developed countries better conditions to overcome diminishing returns to investment. On the other hand, a backward economic system, in which the more advanced technology had not been introduced yet, would in principle be in an even better position to assimilate available technology without facing diminishing returns to capital and, by that, speed up its growth rate (Furtado 1980, pp. 58-63). However, in Furtado's view, the "economic constraint" represented by income concentration and external dependence would prevent the acceleration of the growth process and the elimination of economic dualism in, unless the economic structure was changed through economic planning.

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