

## **Underdevelopment in contemporary world: is structuralism still relevant?**

*Subdesenvolvimento no mundo contemporâneo:  
o estruturalismo ainda é relevante?*

ADEMIR PEDRO VILAÇA JUNIOR\*

---

RESUMO: Este artigo pretende evidenciar que as concepções cepalinas originais ainda são muito relevantes para compreender o crescimento de países subdesenvolvidos e sua inserção nas cadeias globais de valor. É um trabalho teórico que busca avançar no constructo teórico do estruturalismo ao introduzir elementos de distintas abordagens econômicas para estabelecer um nexo teórico para a compreensão da dinâmica de acumulação de capital na periferia. Considerando a relevância da cumulatividade tecnológica, seus impactos sobre a estrutura produtiva e sobre a inserção internacional, procuramos analisar os fatores que perpetuam a divergência de renda em relação ao centro. Sob esta perspectiva, concluímos que as particularidades das economias periféricas modificaram a sua forma de manifestação sem efetivamente superar a relação de dependência perante o centro.

PALAVRAS-CHAVE: Estruturalismo; desenvolvimento econômico; sistema centro-periferia.

ABSTRACT: This paper intends to evaluate if the Latin American structuralist approach is still relevant to understand capital accumulation dynamics of peripheral countries and their insertion in the global value chains. It's a theoretical paper that strives to improve the building blocks of structuralism with the incorporation of elements from different approaches to establish a nexus to understand capital accumulation dynamics in the periphery. Considering the relevance of technological accumulation, its impacts over the productive structure and over the international insertion, we strive to analyze factors that perpetuate income diversion in relation to the center. Under this perspective, we conclude that the particularities of peripheral economies changed their form of manifestation without effectively overcome the dependence relation.

KEYWORDS: Structuralism; economic development; central-periphery system.

JEL Classification: B41; B59; O1.

---

---

\* Economist at SUDENE – Superintendência do Desenvolvimento do Nordeste. E-mail: ademirvilaca@gmail.com. Submitted: 5/October/2015; approved: 2/August/2016.

## INTRODUCTION

Departing from the Latin American Structuralist concepts regarding the specificities of peripheral countries, this paper strives to show that the first contributions of the ECLAC are still very relevant to comprehend capital accumulation dynamics and international insertion of underdeveloped countries. First, we systematize the main characteristics, the transmission mechanisms to the economic tissue and how they react cumulatively internally and externally. Thenceforth, we incorporate some concepts of more recent economic theories to understand the contemporary transformations of the center-periphery system. The theoretical nexus tries to comprehend capital accumulation in the periphery, emphasizing that the dependence bonds changed their forms of manifestation but kept their essence.

The paper is based mainly on the contributions of the Structuralist, Neo-Schumpeterian and Keynesian schools. The first identifies the underdevelopment's particularities stemming from the insertion in the International Division of Labor and describes "essential" characteristics that interact cumulatively and affect capital accumulation (Furtado, 1961). The Neoschumpeterian approach emphasizes the importance of technology, considering its dynamic, cumulative and sectorally differentiated character (Dosi et al., 1990). The productivity growth differentials define a technological hierarchy in which the ability to create capabilities is central to guarantee higher productivity and income growth rates. From the Keynesian school, we emphasize the Kaldorian conceptions ascertain the influence of the productive structure over the Balance Sheet and the external restriction (Resende and Jayme Jr., 2009).

The income and price elasticities of trade have a crucial role in the evolution of the economic structure and international trade. Since they determine the productive and social structures of the economy and its development over time, the elasticities constitute the main bond that interconnects the three schools.

Considering the incapacity of the mainstream economics to effectively explain capital accumulation in the periphery and its social implications, we incorporate other contributions to refine the Structuralist's analytical capacity and its adherence to reality. The combination of different approaches reflexes the particularity and complexity of underdevelopment, understood as a structure intrinsically connected to the center, but with a singular (*sui generis*) growth regime, with effects over social and productive structures. It is important to emphasize that the divergence does not mean determinism, for the obstacles can be bypassed with an effort towards structural change.

A crucial characteristic of the analysis is the cumulateness and path-dependence of economic and social processes, with mutual causality between the elements (specificities) of the system. We try to identify the structural characteristics of the periphery and their impacts over capital accumulation and technical progress.

Analyzing contemporary underdevelopment, Neo-Structuralism acknowledges the obsolescence of the technological matrix and searches a new model based in systemic competitiveness enhanced by private competition. The State is responsible

of keeping macro stability, commercial openness and financial deregulation. Focused in the short term, the approach is oriented to the design and execution of strategies and economic policies, emphasizing the increase of systemic competitiveness, in which “changes in productivity and technical progress absorption are determined by institutional, political and cultural factors” (Missio and Jayme Jr, 2012 p. 223). The idea is to create institutional designs capable of stimulating the interaction of economic agents to promote growth and income distribution<sup>1</sup>.

Acknowledging the relevance of this perspective, this paper emphasizes the material aspects of capital accumulation in the periphery and how structural characteristics interact to influence growth. Even though institutions are crucial to guarantee the success of the development initiatives, we believe that structural conditions remain the fundamental determinants of change.

The fact that economic growth in the periphery does not keep up with the center and it is incapable of absorbing all the low productivity labor sets an evolution pattern that reiterates the (economic and social) divergence through continuous income differentiation between center and periphery.

To analyze these aspects, in the next section we present the essential characteristics of peripheral economies structure. The third section describes the capital accumulation dynamics of these countries. In the fourth section, we analyze contemporary aspects of underdevelopment. Under this perspective, the fifth section emphasizes the importance of the technological component to growth and its role in perpetuating a structure with high heterogeneity and a strong technical gap (regarding incorporation and diffusion of innovations). The sixth section analyses how international insertion feedbacks the system to perpetuate the divergence. Then we present some final remarks.

## SPECIALIZATION, STRUCTURAL HETEROGENEITY AND GROWTH

A crucial point of Latin American Structuralism is the countries insertion in the International Division of Labor and its repercussions over economic specialization and dissemination of technical progress (Furtado, 1961). Since innovation spreads unequally through global economy, it determines a technological hierarchy that directly affects productivity growth.

The cumulateness of technical change stimulates the productivity growth in sectors orientated to the foreign markets, generating an internal sectorial differentiation and consolidating an expressive intersectorial difference of productivity, denominated structural heterogeneity (Pinto, 1971). The coexistence of advanced and obsolete techniques generates a labor structure with predominance of low productivity and low remuneration (Holland and Porcile, 2005; Rodriguez, 2009).

---

<sup>1</sup> An extended explanation of the Neo-Structuralism and a comparison with neoliberalism is available in Missio and Jayme Jr. (2012).

The heterogeneity manifests itself internally (production structure) and internationally (incorporation and diffusion of innovation capacity). The technical improvements in the periphery are slower, with less productive linkages and concentrated in goods with lower technological differentiation. This affects the commercial pattern and the capital accumulation, as we will see in the next sections. Thus, the difference between center and periphery is related to the productivity growth rhythm and also to the capacity of spreading innovation to other sectors.

Externally, the technical gap conforms an economic structure in the periphery specialized in sectors with less technological complexity and low innovation diffusion. Internally, besides the lower productivity growth, the market structures of these countries are normally oligopolists, with fewer innovations, strong segmentation in the labor market and income concentration (Tavares, 1981).

In this way, the primary characteristics of the periphery are specialization and heterogeneity. This aspect is also emphasized by most recent works, as can be observed at McMillan et al. (2014), which analyze the evolution of productivity gaps in peripheral economies. Productive structures determine a commercial pattern that generates continuous external restrictions, consubstantiated in Balance Sheet difficulties. International trade, by its turn, feeds back cumulatively capital accumulation in sectors export oriented.

The structuralist literature also highlights that the deterioration of the terms of trade is an important feature of underdevelopment, since it is a reflex of the difference in income and price elasticities of international trade. This discussion is out of the scope of this paper, but we stress that the deterioration might not be understood as an inexorable law, but as a tendency that affects the commercial performance. It can be worked around by specific conjuncture, but remains as a potential aspect that tends to manifest itself in crises or growth slowdown<sup>2</sup>.

Departing from Rodriguez (2009), we emphasize three main mechanisms of reproduction of the periphery's particularities: the interaction between specialization and heterogeneity, the influence of both over productivity; and the adoption of capital-intensive technologies. These mechanisms reinforce each other in path-dependent process that reiterates the (internal and external) structural differences. Based on these dynamics, we argue that capital accumulation in the periphery and its international insertion follow a specific and unique (*sui generis*) pattern, with cumulative transmission mechanisms that affect capital accumulation.

Specialization and heterogeneity have a double effect over capital accumulation and incorporation of technical progress. Regarding international trade, specialization in products with lower technological content implies lower productivity growth. These products have less differentiation capacity in foreign markets and higher competition, limiting the exports. This productivity differential implies in-

---

<sup>2</sup> The work of Arezki et al. (2013) applies a panel data model that corroborates the acceptance of the Prebisch-Singer hypothesis.

creasing income concentration and contributes to reproduce (and accentuate) internal heterogeneity. Lower innovation diffusion perpetuates this process, limiting the growth of productivity, salaries and income. Fajnzylber (1976) highlights that the productivity differentiation tendency is strengthened by the incapacity of endogenous technical progress generation, for productivity growth is restrained by the incorporation of foreign techniques, what is also pointed out by more recent studies (Dosi, et al., 1990; Macmillan et al., 2014).

Specialization determine the internal sectors with bigger productive gains, consolidating a correspondent trade pattern and growth rate compatible with the external restriction while the heterogeneity induces the technological concentration and labor market segmentation. Both are directly influenced by technological evolution.

Rodriguez (2009) states that technical progress has three main characteristics: high capital density, factor rigidity and scale indivisibility. The investments need a growing capital mobilization, which is accentuated by factor's rigidity while minimum scales are excessive to the markets, favoring the consolidation of oligopolies.

Since the technologies are capital-intensives, production growth is followed by decreasing labor absorption. Consequently, capital deepening occurs without absorbing low productivity labor. This phenomenon was denominated "structural labor surplus".

In other words, productivity growth is insufficient to overcome the structural deficiencies in productive and labor structures. In the former, there is excessive resource centralization in a context of capital scarcity, increasing the opportunity cost of the investment and diminishing its relative efficiency. In the labor market, growth is unable to absorb low productivity labor, segmenting the labor market and decreasing the average productivity and income of workers.

Capital-intensive technologies accentuate the lower stimuli to investment and scarce innovation incorporation. Labor surplus limits wage growth, diminishing the average wage and consolidating a segmented labor structure, which reinforces the income concentration and decreases the pressure for additional wage growth, with impacts over consumption market (Tavares, 1981; Oliveira, 1981; Cimoli et al., 2005; Rodriguez, 2009).

This process can be consubstantiated in the concept of "dynamic insufficiency" (Tavares, 1981), understood primarily as the persistence of structural underemployment that is not absorbed by the modern sector. The term is also related to factors that inhibit the absorption of underemployment to productive employment, with main reference to the specificities of foreign techniques and their consequences to the conformation of the peripheral productive matrix.

Lower productivity perpetuates backwardness while lower labor remuneration decreases internal demand. This "dynamic insufficiency" restrains capital accumulation by demand constriction. However, the oligopolic structure guarantees an accumulation regime that grows with increasing concentration in income and pro-

ductive structure (Tavares, 1981). This generates impacts on the supply and demand sides of the economy. Regarding the supply, it implies lower pressure over production costs, favoring the increase of profit rate and inhibiting investment (Lamonica and Feijó, 2007). Regarding the demand, it represents an internal demand insufficiency, for the purchase power of the workers is unable to absorb the production<sup>3</sup>.

These aspects are different according to national conditions, but represent general characteristics of underdeveloped countries. Productive diversification attenuates these traits, but technology still follows the technical patterns of the center. The technological learning consolidates intersectorial productive gaps, raising the differentiation internally (by bigger growth rates of export sectors) and internationally (by differentiated growth rates of countries).

Thus, underdeveloped economies have inherent attributes related to their structure that affect their evolution. Even though they can be cloaked by specific conjunctures (rise of commodities price or wage increase), they remain latent and eventually outcrop (usually in crisis).

Under this perspective, while the work of Missio and Jayme Jr. (2012) explores the institutional design to promote sustainable development, we strive to systematize the essential characteristics of the capital accumulation process and its interaction mechanisms that contributes to perpetuate the differentiation in relation to the center.

We believe that the singularity of this paper refers to the emphasis in the material aspects that conforms capital accumulation regardless the institutional frameworks. This does not imply that these frameworks are not important it actually represents a complementary effort to advance in the comprehension of peripheral dynamics in its multiple dimensions.

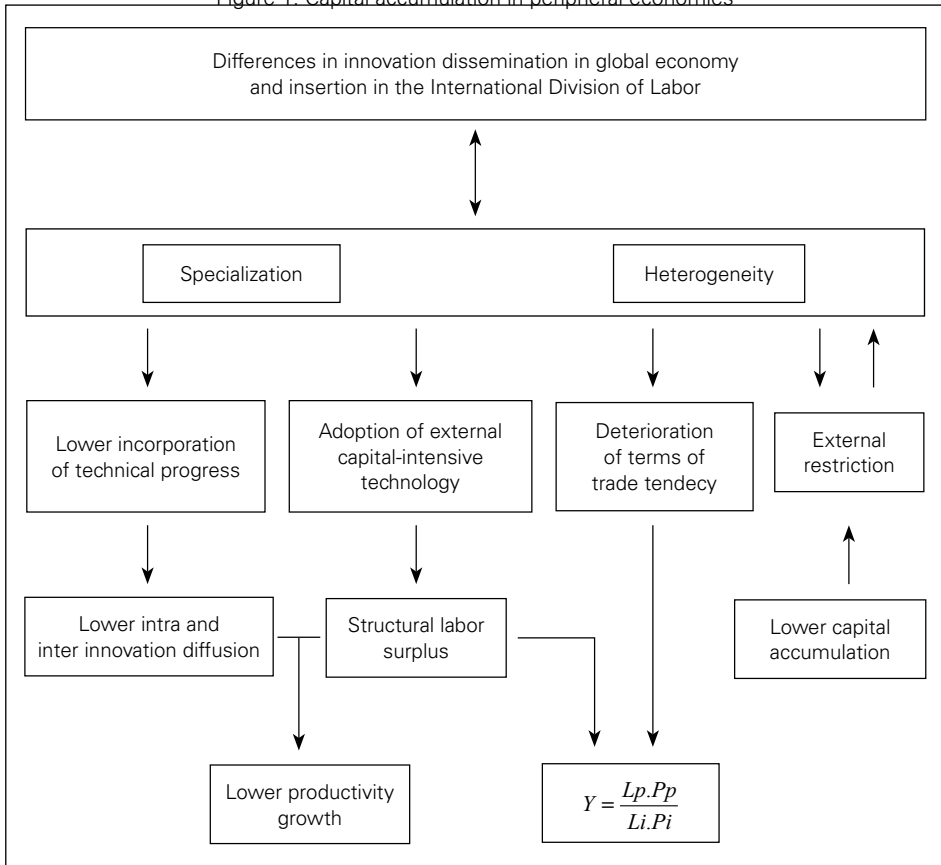
## UNDERDEVELOPMENT SPECIFICITIES AND INCOME DIFFERENTIATION

According to Sunkel and Paz (1970), given the system structure, it is possible to determinate its mechanics, which generates results that are direct derivations of the system structure. The idea of this section is to identify elements of peripheral structure and highlight the interactions between the essential attributes, especially those regarding heterogeneity, specialization and productivity growth. We emphasize that these elements act more like tendencies rather than unavoidable determinations. Figure 1, based on Rodriguez (2009), tries to identify the peripheral specificities and the transmission mechanisms.

---

<sup>3</sup> Wage valorization overcomes the problem, but the structural change only occurs if the low productivity labor is absorbed.

Figure 1: Capital accumulation in peripheral economies



Source: Elaborated by the author based in Rodriguez 2009, p. 85.

Rodriguez (2009) estates that differentiation occurs through the evolution of income per worker. The center-periphery system perpetuates the divergence through differences in the labor productivity ( $L_p$  and  $L_i$ ) and prices ( $P_p$  and  $P_i$ ) of industrialized (i) and primary (p) goods. In the supply side of the economy, the ratio between real income per worker ( $y = \frac{L_p \cdot P_p}{L_i \cdot P_i}$ ) favors capital accumulation in the center in a dynamic process that is a direct outcome of the peripheral characteristics and their interaction.

Regarding productivity, specialization in goods with lower technological complexity inhibits growth because of their lower productivity growth rates. Regarding prices, labor surplus decreases the pressure for wage raises, diminishing the production costs and the relative price of peripheral goods.

Low wage pressure and inferior productivity growth interact cumulatively to decrease the average income in the periphery, perpetuating the divergence. At this

point, the Balance Sheet determines the import capacity and, consequently, the productivity growth due imports of new technologies<sup>4</sup>.

In the demand side of the economy, the conspicuous consumption of the elite (demonstration-effect) internalizes patterns of the central economies, with two direct consequences. In one hand, it implies an increase in import elasticities and income leakages, since a significant part of the economic surplus is directed to the acquisition of consumption goods. In the other, demonstration effect consolidates a productive structure oriented by external techniques, establishing an accumulation regime with capital coefficient incompatible with internal income (Furtado, 1961; Rodriguez, 2009).

Analyzing underdeveloped countries, Furtado (1961) highlighted the central role of the trade elasticities over capital accumulation. The differences in income and price elasticities influence both productivity (technical accumulation) and prices (differentiation capacity).

This importance is confirmed by the Neo-Schumpeterian and Keynesian schools. According to Dosi et al., (1990), productive structure defines external insertion. Bigger technological complexity increases both price and income elasticities. The positive correlation between technical advancement and oligopolic structures is due to the difficulty of imitation (bigger appropriability), favoring price differentiation and reducing price volatility. The relation between export and import elasticities defines the degree of the external restriction (Rodriguez, 2009; Gouvêa and Lima, 2013).

In this line of thought, Jayme Jr. and Resende (2009) identify four attributes that define the export growth potential: market structure (concentration degree), dynamism (growth rates); protection degree, and productive diversification. The closer to an oligopolic structure, bigger the capacity to determine the price. Bigger demand growth generates higher value of exports. More open markets increase the value exported while diversified economies have a bigger number of sectors capable of exporting.

These approaches confirm the idea that specialization in sector with lower technological complexity decreases technical progress incorporation, limiting competitiveness, restricting external trade and inhibiting capital accumulation.

We can observe the compatibility and complementarity between structuralist concepts and recent contributions of Neo-Schumpeterians and Keynesians. In this perspective of theoretical integration, we now analyze how the fundamental characteristics of structuralism perpetuate themselves in the contemporary dynamics of capital accumulation in the periphery, modifying its form of subordination to the center, but keeping the essence of dependence.

---

<sup>4</sup> Furtado (1961) highlights that the conspicuous consumption accentuates the problem since it commit “unproductively” the (low) available currency.



Cano (2008) analyses the production structure of Brazil and shows that the expansion occurred with incorporation of external technology. This generated an expressive difference in productivity level and growth rates throughout the country. The internalization occurred extensively, that is, with reallocation of activities without technological deepening and innovation. The productive deconcentration occurred in less complex sectors and the intersectorial productivity differentials remained<sup>5</sup>. Although the analysis is directed to a single country, it highlights important features of capital accumulation in peripheral economies.

Modern sectors are incapable of absorbing surplus labor while low innovation diffusion contributes to consolidate “high productivity islands”. These characteristics imply an asymmetric labor structure with predominance of low productivity workers. This dynamic accentuates specialization and heterogeneity, corroborating that essential elements of structuralism are still relevant in the contemporary underdeveloped countries.

Analyzing peripheral economies, Cimoli et al., (2005) highlights that heterogeneity has at least three components: intersectorial productivity differences; intra-sectorial differences (dominated by transnational companies, as shown by Kupfer and Rocha, 2005); and expulsion of the industrial labor force mainly to low productive services.

Intersectorial heterogeneity is a consequence of specialization and technical growth differentials. Exporting sectors have higher growth rates, favoring differentiation in relation to the rest of the economy. The intrasectorial difference reflexes the polarization of the productive chains by the transnationals. Since they usually establish an oligopoly, the complementary activities tend to gravity over their production decisions. The expulsion of labor force is due to the capital-intensive technologies that raises productivity and expels labor which, in turn, is absorbed by low productivity sectors.

The intersectorial aspect is reinforced by the intrasectorial impacts due to the polarization of transnational companies (Kupfer and Rocha, 2005). The intra and intersectorial dimensions influence each other cumulatively. This interaction, conjugated with the technical progress concentration, induces a bigger growth of export sectors, feed backing the specialization, the (internal and external) heterogeneity and establishing a hierarchy of sectors in terms of productivity and income.

The productive matrix is not integrated, decreasing the positive externalities due to productive (Keynesian) and technological (Schumpeterian) linkages. Specialization accentuates divergence in the innovation capabilities, reinforcing the sectorial hierarchy internally and internationally. Fajnzylber (1976) highlighted that the

---

<sup>5</sup> The papers of Oliveira and Feijó (2012) and Gramkow (2011) clearly show that the heterogeneity still remains an important aspect of Brazilian productive structure.

technological monopoly inhibits sectorial diffusion, but these aspects are still relevant in contemporary world, as shown by Holland and Porcile (2005).

More recently, McMillan et al., (2014) showed that underdeveloped countries still have a huge productivity gap between sectors. The modern part of the economy grows and expels labor to low productivity services, decreasing the average productivity and inhibiting growth.

In this context, the globalization dispersed the productive chains but maintained the technological monopoly by center economies. Transnationals control global value chains and their production decisions (with impacts in jobs, income and technological modernization) are still determined in the center.

Transnationals are attracted to the modern sectors because of bigger profits. Due to the minimum scale requirements, they acquire advantages in production (Kaldorian externalities) and also in market relations, acting both as an oligopoly and an oligopsony. This decreases competition and guarantee a high profit rate.

Besides the intersectorial differences, transnationals induce a process of intra-sectorial productivity differentiation, since they incorporate more innovations and do not induce diffusion to other activities (Kupfer and Rocha, 2005). This pattern has impacts over the labor structure, corroborating the concepts about the influence of capital-intensive technologies over labor absorption.

Under this perspective, technological monopoly has two implications over the capital accumulation in the periphery. In one hand, generates expressive differences in productivity growth rates intra and intersectorially. In the other, distorts the prices and discourages the endogenous generation of technology. Since these companies suffer low competition, they have less incentive to innovate (Feijó and Lamonica, 2013). Besides, the access to external technologies discourages the internalization of technical progress, reinforcing the dependence.

Summing up, transnational companies have impacts intra and intersectorially. In the former, they discourage competition, technical diffusion and influence the growth of complementary activities due the productive chain polarization. In the latter, the access to technology and financial resources increases the productivity difference and inhibit the local technological development.

This context is accentuated by the low pressure over wage increase. In central economies, the labor scarcity and strong unions induce wage raises, increasing productivity by stimulating innovations directed to substitute labor by capital. Bigger wages act as incentives to innovation and capital deepening. In underdeveloped countries, the low salary pressure favors profit, discouraging innovations and limiting the productivity raise (Feijó and Lamonica, 2013). So, there are fewer incentives to investment due to lower competitive pressure stemming from the oligopoly and from the lower pressure to wage raise due to labor surplus<sup>6</sup>.

In other words, the periphery has a capital accumulation regime that expands

---

<sup>6</sup> This tendency is accentuated by the impact of high interest rates over investment, since it raises the productive investment's opportunity cost.

in conditions of high profit rates, lower competitive pressure and lower salaries, generating fewer innovations that are, in turn, only partially diffused to other sectors. Since these sectors grow slower and are (directly and indirectly) connected to the modern sectors, there is a technical-productive dependence on external technologies. It is precisely in this way that the peripheral dynamics does not overcome the dependence, with impacts over the productive structure (through technical patterns and technological cumulativeness) and over the demand (labor market structure and demonstration-effect).

It is important to emphasize that the distinction between center and periphery is not equivalent to the difference between diversified and specialized productive structures. The fundamental characteristic of the center is its capacity of generating up-to-date technology (Lamonica et al., 2012). The homogeneity of sectorial productivity induces greater technological capabilities, favoring the innovative process directly (technical cumulativeness) and indirectly (greater innovation diffusion). So, the diversification of productive structure is a necessary condition, but not sufficient to reduce the technological gap. It must be followed by the increase of technological capabilities and innovation diffusion.

Periphery's industrialization by import substitution diversified the productive structure and increased consumption. Even overcoming the basic differentiation between primary exports and manufactured imports, one can observe specialization in less complex goods. The technological matrix adopted was incapable of absorbing the labor surplus and the innovation diffusion was insufficient to homogenize the economic structure. In this way, the technological dependence is the new form of "subordination" of the periphery.

The periphery growth and diversification were insufficient to overcome the bottlenecks stemming from specialization, heterogeneity and its derived effects. Specialization favors sectors with low technological complexity, concentrating technical progress and, therefore, accentuating structural heterogeneity. Heterogeneity has a double effect over capital accumulation. In one hand, generates concentrated production and distributional patterns. In the other, the differences between sectors restrict innovation diffusion, reinforcing cumulatively the specialization and the heterogeneity itself (Cimoli et al., 2005).

Meanwhile, specialization in global level also generates expressive differences in incorporation, assimilation and diffusion of technical progress, establishing a global hierarchy of productivity growth (Cimoli *et al*, 2005; Rodriguez, 2009). The difficult in incorporating and diffusing innovations implies a technical difference in relation to the center, called technological hiatus.

## CAPITAL ACCUMULATION AND TECHNOLOGICAL HIATUS

According to Dosi et al., (1990), since technical change induces productive differentiation through creation of technological capabilities, it is the main force that drives structural change and international specialization. Economies capable

of absorbing new paradigms are more open to sectorial change and innovation diffusion (Cimoli et al., 2005).

Structural change is intrinsically connected to the ability to absorb, enhance and spread innovation, favoring productivity growth, increasing income and changing international insertion. These differences are a reflex of the technological hiatus, related to the capacity of generation, assimilation and diffusion technical progress. The hiatus can be understood as the gap between the technological capabilities of a given country and the capabilities of countries in technical frontier (Cimoli *et al.*, 2005).

According to Lamonica et al. (2012), the “technological hiatus is the fundamental reason to the lower productivity – and per capita income – growth in periphery” (p. 153). Given that technological intensive goods have bigger productivity growth and higher innovation diffusion, the productive structure of the center grows faster and more homogeneously.

The hiatus deepness is related to the relative difference between local productivity level and the international reference. It is a two-way process, technological handicap inhibits innovation generation and diffusion, which, in turn, feedbacks the handicap. Since the gap determines the technological evolution of the productive structure, it also influences the consolidation of the internal productive structure and its international trade pattern.

The difficulties to generate, assimilate and imitate technical change determines the international heterogeneity (differences between countries) while the difficulty of diffusion influences the internal heterogeneity, intra and intersectorially. In this context, technological learning is crucial because of the specificity and cumulativeness of technological trajectories (Malerba and Nelson, 2011).

While sectorial productivity growth differences in the periphery accentuates internal heterogeneity, the faster rate of growth in the center increases the technological hiatus (external heterogeneity). In this way, the technological gap is also a specificity of underdevelopment.

Cimoli et al. (2005) states that productivity growth is determined by three factors: innovation (technical and organizational), sectorial diffusion, and technological learning. The first emphasizes the microeconomic aspect of growth, the second reflexes the macroeconomic pattern while the third represents the interaction between the micro and macro aspects of technological progress. The innovation shows the search for firm differentiation. The sectorial diffusion is associated to the possibility of incorporation of the new technique in other sectors while the technological learning depends on the innovative effort.

Cimoli et al. (2005) highlights that the specialization pattern of a country – and its growth rate compatible with the external balance – is a function of the technological hiatus. Specialization also has direct impact over the quantity and quality of the jobs, over the innovative capacity (intrasectorial productivity), and over the diffusion of the technical progress (intersectorial productivity).

McMillan et al. (2014) states that labor productivity growth can be achieved in two ways. First, productivity can grow within sectors through capital accumula-

tion, technological change, or reduction of misallocation across plants. Second, labor can move across sectors, from low-productivity sectors to high-productivity sectors, increasing overall labor productivity in the economy.

Acknowledging these approaches, we defend that the diffusion difficulty has crucial impact over growth, since it increases the internal productivity difference and inhibits sectorial leveling, regarding both productivity and labor income. This conception is present in the literature, but we believe that its impacts are undervalued considering the implications for development.

Technological hiatus determines the possibilities of the structural change and, therefore, the trading patterns. In this perspective, the next section strives to show how the international insertion affects the capital accumulation of the periphery.

## PRODUCTIVITY, INTERNATIONAL INSERTION AND GROWTH

In international trade analysis, Ricardian models states that activities with lower productivity are subject to more imports (Dosi et al., 1990). This is compatible with the structuralist models of international trade (Cimoli et al., 2005), and more recent analysis about patterns in international trade (McMillan et al., 2014). Thus, there is a relationship between specialization, heterogeneity, technological hiatus and external performance. Greater participation in knowledge-intensives sectors favors productive and labor structures. The first is benefited by the innovation growth and diffusion while the latter due the greater qualification of labor force.

The pattern of the productive structure has impacts due to “Keynesian”, “Schumpeterians” and “Ricardian” effects (Dosi et al., 1990). The first are associated to the multiplicative effects arising from the expansion of sectors directly (productive linkages) and indirectly (rise in demand). Schumpeterian effects concern the relation between technical progress and capital accumulation, influenced by the specialization pattern (which, in turn, defines the technological gap). Ricardian effects are related to the relative price changes and are directly influenced by technical improvements.

Besides the existence of more linkages, diversified structures have greater capacity of generating externalities and diffusing innovation. This increases Keynesians effects and facilitates the propagation of Schumpeterian effects, enhancing competitiveness due to Ricardian effects over prices.

According to Jayme Jr. and Resende (2009), while the Keynesian literature emphasizes the importance of increase of income elasticity of exports and decrease of income elasticity of imports to overcome external restriction, the Neo-Schumpeterian literature highlights the importance of technology to sustained growth.

In the macroeconomic perspective, trade surplus define the long term growth, while from the microeconomic perspective, growth is defined by the capacity of increasing technological intensity to sustain the trade surplus. These approaches represent complementary aspects of growth.

The macro-micro interaction is also treated by Holland and Porcile (2005). The authors attest that the macro dimensions of technological gap, external restriction and growth have a microeconomic counterpart. From the macro, lower technological accumulation capacity implies lower productivity, decreasing competitiveness and inhibiting capital accumulation. Regarding the micro, technological gap represents greater obstacles to incorporate technical improvements in the firm level, with straight impacts over sectorial performance (internally and externally).

In this process, the differences in income and price elasticities of international trade are an additional axis for income differentiation. The elasticities (related to the productive structure) are the main drives of the technological gap, accentuating economic specialization and heterogeneity, with direct impacts over growth capacity.

Lamonica et al. (2012) attest that the rhythm of capital accumulation affects technological gap, especially if it stimulates an endogenous process of innovation generation and diffusion. This will affect the income elasticity of exports with a parallel decrease of income elasticity of imports, raising the growth rate compatible with the Balance Sheet equilibrium (Jayme Jr. & Resende, 2009; Gouvêa & Lima, 2013). The elasticities, in turn, influence the external vulnerability and the growth capacity (Cimoli et al., 2005). Besides, endogenous innovation increases the possibility of horizontal spillovers, with direct impact over heterogeneity.

McMillan et al. (2014) emphasizes that allocative inefficiencies can be a potential engine of growth. When lower productive factors move to modern activities, economy grows even if there is no productivity growth within sectors. They attest that this kind of structural change can be an important contributor for economic growth.

Besides, productive diversification increases the technological content of exports, reducing the productivity differences and increasing the incorporation of new technology. Capital accumulation has strong productive lock-in, with direct impacts over growth, innovation diffusion and technological improvements.

More recently, the “economic complexity” approach included new elements in this debate. The theory proposes that the productive structure of countries is determined by the local availability of highly specific inputs, or capabilities, considered as the building blocks of production (Hidalgo, 2009). The sophistication of a product is related to the number of capabilities that the product requires; whereas the complexity of a country’s economy is related to the set of capabilities it has locally available.

This theory has been described formally and tested empirically by using the structure of the network connecting countries to the products they export to infer the complexity of products and of the countries that produce them. In this way, countries need specific combination of inputs (capabilities) to produce a product. Besides, considering the cumulateness of technical progress, countries tend to diversify their economies to sectors closely related to the existing ones (Hidalgo, et al., 2007). Since developed countries have more complex structures, they tend to specialize in more sophisticated products while underdeveloped countries specialize

in basic products. These findings are consistent with the features and characteristics described above.

Under this perspective, directed stimulus to technologically dynamic sectors is capable of reducing periphery heterogeneity. Greater productivity growth reduces the technological gap, increases international competitiveness and overcomes external vulnerability. The innovation diffusion is crucial to reduce internal heterogeneity (intra and intersectorial), inducing technological cumulativeness. In this context, it is important that the technical incorporation occurs with parallel development of technological capabilities in order to create endogenous innovations and reduce technological dependence.

## FINAL REMARKS

The analysis strived to show that original ECLAC contributions are still relevant to understand the development of peripheral countries and their insertion in global value chains. The paper identifies the essential characteristics of capital accumulation dynamics in underdeveloped countries and its tendency to accentuate the divergence in relation to the center. Departing from this perspective, we presented complementary elements of Keynesian and Schumpeterian approaches to evaluate how the basic characteristics of underdevelopment have changed due to global economic integration without overcoming their dependence.

The technological cumulativeness ensures the perpetuation of the economic differentiation between center and periphery. Since the relationship between capital accumulation and technical progress is path-dependent, the commercial pattern established by the productive structure accentuates a dependent international insertion. In this process, the income ratio between countries (determined by the productivity and by the income and price elasticities of goods) is the intertemporal transmission mechanism of differentiated growth of the poles of the system.

Specialization and heterogeneity (internal and external) are the fundamental characteristics of peripheral structure, with mutual interaction that influence development. It is important to highlight that they must be understood as tendencies that act to perpetuate a specific accumulation regime connected to the center, but they are not inexorable laws. The technological dynamism inherent to capital accumulation opens the possibility to overcome the peripheral condition since they change the technological paradigms.

We defend that center-periphery relation acquired other form (technological dependence) but kept the essence of an accumulation regime with continuous income differentiation. The greater complexity of dependence relation can be observed by the different ways by which the differentiation tendencies manifest. The specialization implies structural heterogeneity internally and externally. In the first, heterogeneity subdivides in intersectorial and intrasectorial. The first is a reflex of expressive differences in productivity growth rates while the latter occurs due to the productive chains polarization by transnational companies. Both are directly

influenced by the innovation diffusion obstacles, which feedback cumulatively the productive structure.

This paper intends to establish a theoretical background of a broader research agenda. The identification of the basic attributes and their inter-relations are the departure point to evaluate how the theoretical categories manifest concretely. Beyond the scope of this paper, it is important to measure the degree specialization of the productive structure and the magnitude of the internal heterogeneity. The structural change analysis can define the evolution of the technological gap and the productivity differences intra and intersectorially.

In relation to the innovation diffusion, it is important to verify which sectors present greater potential to generate intersectorial innovations to reduce heterogeneity. Regarding the labor market, it is important to evaluate the size and the impacts of the labor surplus over the remuneration of the workforce. Lastly, acknowledging the peripheral specificity is crucial to design policies to promote economic growth and stimulate the incorporation of low productivity labor by modern sectors in an effective development process with growth and income distribution.

In fact, the allocative inefficiency of the heterogeneous structure can be a potential engine to growth. When low productive factors move to more productive activities, economy grows even if productivity is stagnated within sectors. This kind of structural change can be a starting point for economic growth. If this strategy is conjugated with the development of sectors capable of internalizing and disseminating innovations in economic tissue, the backwardness of underdeveloped countries can be overcome.

## REFERENCES

- AREZKI, R.; HADRI, K; LOUNGANI, P.; RAO, Y. (2013) "Testing the Prebisch-Singer Hypothesis since 1605: Evidence from panel techniques that allow for multiple breaks". *IMF Working Paper*. WP/13/180
- CANO, W. (2008). *Desconcentração produtiva regional do Brasil 1970-2005*. São Paulo: Unesp.
- CIMOLI, M. PORCILE, G, PRIMI, A., VERGARA, S. (2005) "Cambio estructural, heterogeneidad productiva y tecnología em America Latina". In: M.Cimoni, ed. *Heterogeneidad estructural, asimetrías tecnológicas y crecimiento en America Latina*, Cepal/BID: Santiago de Chile.
- DOSI, G. (1984) *Technical change and industrial transformation*. New York: Martin's Press
- DOSI, G. (1988) *Technical change and economic theory*. London: Penguin.
- DOSI, G; PAVITT, K. SOETE, L. (1990) *Economics of technical change and international trade*. Nova York, Penguin.
- FAJNZYLBER, F. (1976) "A empresa internacional no processo de industrialização da América Latina". In: J. SERRA, ed. *América Latina: ensaios de interpretação econômica*. São Paulo: Paz e Terra.
- FEIJÓ, C. A.; LAMONICA, M. T. (2013). "A Kaldorian approach to catch-up and structural change in economies with a high degree of heterogeneity". *PSL Quarterly Review*, vol. 66, n 265, 107-135.
- FURTADO, C. (1961) *Desenvolvimento e subdesenvolvimento*. Rio de Janeiro: Fundo de Cultura.
- GOUVÊA, R. R.; LIMA, G. T. (2013). "Mudança estrutural e crescimento sob restrição externa na economia brasileira: 1962-2006". *Economia e Sociedade*, vol. 22, nº1, Abril.
- GRAMKOW, C. (2011). "Heterogeneidade estrutural e da inserção externa no Brasil: uma análise empírica para o período de 1990 a 2008". In: 39º Encontro Nacional de Economia, 2011.



- HIDALGO, C. (2009) “The dynamics of economic complexity and the product space over a 42 year period.” *Working Paper* No. 189. Cambridge, MA: Center for International Development, Harvard University.
- HIDALGO, C., B. KLINGER, A. L. BARABASI, and R. HAUSMANN. (2007). “The product space conditions the development of nations.” *Science* 317: 482–487.
- HOLLAND, M., PORCILE, G. (2005) “Brecha tecnológica y crecimiento en América Latina”. In: M. Cimoni, ed. *Heterogeneidad estructural, asimetrías tecnológicas y crecimiento en América Latina*, Cepal/BID: Santiago de Chile.
- JAYME JR, F. G.; RESENDE, M. F. C. (2009) “Crescimento econômico e restrição externa: teoria e a experiência brasileira”. In: Renault M.; Mello, L. (org.). *Crescimento Econômico: Setor Externo e Inflação*. 1 ed. Brasília: IPEA, v. 1, p. 25-45.
- KUPFER, D. ROCHA, F. (2005) “Productividad y heterogeneidad estructural em la industria brasileña . In: M.Cimoni, ed. *Heterogeneidad estructural, asimetrías tecnológicas y crecimiento en América Latina*, Cepal/BID: Santiago de Chile.
- LAMONICA, M. T.; FEIJÓ, C. A. (2007) “Crescimento e Industrialização no Brasil: As lições da lei de Kaldor”. In: 35º Encontro Nacional de Economia. 2007
- LAMONICA, M. T., OREIRO, J. L. FEIJÓ, C. A. (2012) “Acumulação de capital, restrição externa, hiato tecnológico e mudança estrutural: teoria e experiência brasileira”. *Estudos Econômicos*, São Paulo, vol. 42, n.1, p.151-182, janeiro-março.
- MALERBA, F.; NELSON, R. (2011) “Learning and catching up in different sectoral systems: evidence from six industries”. *Industrial and Corporate Change*, V. 20. N° 6.
- MISSIO, F.; JAYME JR, F. (2012) “Estruturalismo e neoestruturalismo: velhas questões, novos desafios”. *Análise Econômica*, Porto Alegre, ano 29, n. 57, p.205-230.
- MISSIO, F.; JAYME JR, F.; OREIRO, J.L. (2015) “The structuralist tradition in economics: methodological and macroeconomics aspects”. *Brazilian Journal of Political Economy*, vol. 35, n°2, pp 247-266, abril-jun/2015.
- OLIVEIRA, F. (1981) *A Economia Brasileira: Crítica à Razão Dualista*. 4 ed. Petrópolis: Editora Vozes.
- OLIVEIRA, D. R.; FEIJÓ, C. A. (2012). “Mudanças estruturais na economia brasileira e seus impactos sobre a produtividade na indústria de transformação pós-1990”. In: Andre Azevedo, A.F.Z.; Feijó, C.; Coronel, D.A. *Desindustrialização Brasileira*. 1ª. edição. São Leopoldo: Unisinos, 2013, p. 147-180.
- PINTO, A. (1970 [2000]) “Natureza e implicações da ‘heterogeneidade estrutural’ na América Latina”. In: R. BIELSCHOWSKY (org.) *Cinquenta anos de pensamento na CEPAL*. vol. II. Rio de Janeiro, Cofecon-Cepal; Record, 2000. Publicado em *El trimestre económico*, vol. 37(1), n° 143, México: Fondo de Cultura Económica, janeiro-março de 1970.
- RODRIGUEZ, O. (2009) *O Estruturalismo Latino Americano*, Rio de Janeiro. Civilização Brasileira.
- MCMILLAN, M., RODRIK, D., VERDUZCO-GALLO, I. (2014) “Globalization, structural change and productivity growth, with an update on Africa”. *World Development*. Vol. 63. P.11-32
- SUNKEL, O.; PAZ, P. (1970) *Subdesarrollo Latinoamericano y La Teoría Del Desarrollo*, Ciudad de Mexico, Siglo Veintiuno
- TAVARES, M.C. (1981) “Problemas de industrialización avanzada en capitalismo tardío y periféricos”. *Economía de América Latina*. México: Centro de Investigación y Docencia Económicas, n. 6, primeiro semestre.
- VILAÇA, A.; CONCEIÇÃO, O. C. (2014) “Emulação, efeito demonstração e dependência: uma análise das contribuições de Veblen para a compreensão da dinâmica de desenvolvimento periférico.” In: XIX Encontro Nacional de Economia Política.