



# **FUNDAMENTALS OF ANALYSIS AND PLANNING OF REGIONAL ECONOMIES**

Carlos Águedo Nagel Paiva

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## PREFÁCIO

This odd moment Latin America is going through, contradicts the exhausted models of development,

which has been making entire societies sink into discouragement, desperation, and lose hope, that in turn require Brazil especially to seek permanent alternatives for sustainable development that consider the organization of its society, social inclusion, the strengthening of productive chains in agriculture, industry, commerce, and services, the knowledge, innovation, mechanisms for reinvestment in the territory, support for micro and small businesses, to family-based agriculture and cooperative associative movements. This is done considering the peculiarities of our territorial diversity.

Dr. Carlos Paiva, the author, whose commitment to introduce his knowledge on economic models through his simple, clear-cut, and easily understood style, helping to develop a territory in this work, as it is doubtlessly a great contribution to those like us, who seek answers, inspiration, and tools to modify the reality.

For Itaipu Binacional, it is an honor to be able to contribute to our territory and others, spreading these contents in the expectation to have an impact on the development of our Country and throughout all over Latin America.

*Jorge Miguel Samek*

*Brazilian Managing Director*

*ITAIPU Binacional*

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In the recent economic crisis in 2008, caused by the capital investment in the financial system in detriment to investments in production, which demonstrates once again, the necessity of the territories to combat development mechanisms based on their own fortresses. Obviously, this requires an action plan, which makes one completely aware of the territory, based on the point of view of its productive chains, potentialities, and necessities of its social capital, handling the natural resources, and other aspects as well. But, the fundamental requirement is the organization of a community in the quest of finding its own destiny. In order for this to occur, the knowledge of economic phenomena is vitally important in order to understand the role of local development. In the work by Carlos Paiva, it precisely provides this knowledge, written in clearly understandable language, stripped from all excessive academic irritation, making this accessible to the reader the concepts of endogenous development, inciting a reflection and causing one to accept the challenge of its implementation.

*Juan Carlos Sotuyo*  
*President Director*  
*Itaipu Technological Park - Brazil*

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## **Introduction (and Acknowledgements)**

In the “Introduction” on his *Lessons on the History of Philosophy*, Hegel teaches that what is true in the theoretical production is doomed to “eternal return”. Firstly, in its specific and scholastic manner, in its “isms” manner – we are empirical, relativist, skeptics, rationalize, etc. The incessant return ends by synthesizing the contrary, the synthesis of the “isms”. As each philosophy that insists on returning carries a significant portion of the truth. And this dimension will be imposed on all (even those which are currently denied) when the synthesis allows the overcoming of partisanship (on behalf of the isms).

The Marxist conception of scientific development is quite similar to Hegelian. But Marx introduced another element in the reflection: resistance strictly ideological to science. Some of these ideas are already agreed to in the plan of science. But they injure interests which are too strong which may be transformed into common sense. One of these ideas is already (in science) and not yet (in common sense) agreed is the thesis on which equity is based, simultaneously, solidarity, civism, good government, and economic development.

This thesis emerges accurately in antiquity. Aristotle defends in *Politics*, in answer to the elitism of the Platonic Republic and its “moral guardians”. But doubtlessly, the greater defender of equality in antiquity was Jesus Christ. When Hegel considers Christianity as the highest form of religion, he did not become enslaved by the prejudices of his epoch. In his epoch – in the transition from enlightenment to romanticism – it was no

longer considered “good taste” to contemplate Christianity as a superior religion to the mythologies of ancient European and/or Oriental religions. The aversion of Nietzsche to Christianity and his expression of tragedy (and mythology) of the Greeks and the Zoroastrianism of Zarathustra is far from being an atypical and idiosyncratic manifestation. Nietzsche is nothing more than the apogee (and the announcement of decadence) of the German romanticism. Romanticism attracted Hegel in his youth, when philosophy praised the humanity Greek gods and criticized the mosaic censure between God and men. Until Hegel discovers that the essence of Christianity (as opposed to the Jewish Torah) is exactly found in the pretention that “God is human”; and as such, He is devastated by doubts and utopian projects, to demand the impossible from men (love others as yourself), yield to wrath (against the merchants in the temple), suffer, fear, and feel pain and – in the end – die. Christ is a man. And He is God. And each man should follow His example, no matter who he is, be an equal. Christianity said Hegel is the theology of equality by excellence. There are no chosen people, neither unquestionable truths. His only insurmountable rule is to love everyone and treat one another as an equal.

Nothing is further from the Christian normatively than the rational positiveness and coldness of the Neoclassic School, the most conservative and the most disseminated among the theoretical traditions of Economy. But in the XX century, the Neoclassical Economy created the Game Theory, which has come to demonstrate irrational solidarity is the sine qua non condition of the efficiency of the mercantile organization.

The broad-based diffusion of neoclassicism is inseparable from the fact that offers manageable research tools. Normally, these tools depend on absurd hypotheses, such as: “we suppose

that the agents commune in the same institutional system and that all the cultural peculiarities and the spatial inequalities can be ignored”. Or even worse hypotheses, such as: “we suppose that all humanity is composed of people with family-type farmers from the American mid-west”.

The economists, in fact, are responsible for dealing with reality – the managers of the regulatory institutions and those responsible for production and budgeting execution in the government – criticize, correctly, the unrealism of this system. But the critic cannot confuse through denying this chain of thought. So as Hegel teaches, if it exists and then insist for it to be reproduced, if there is any truth in it.

What is the true contribution of the Theory on Games? It dissects the decision-making process of an individual whose behavior is exactly as the “economic man” standard as expressed in neoclassicism. And this mathematics reveals if the world were populated by agents who maximize opportunities – those who seek only private benefit and do not hesitate to exploit any asymmetric information to be favored by it – countless reoccurring competitive games in the economies in the market are solved by sub-optimal solutions. If all the players are intelligent and opportunists and they know that the others are too, the costs of the transaction and aversion to risk are exponentiated and the best game strategy may be “not to play”. And, if one plays, he or she may not collaborate. The dilemma of the prisoner is not the only game strategy with the “lose-lose” solution. It is only the simplest manner to demonstrate the perversity of opportunism.

The creators and developers of the Theory on Games disagreed on their own conclusions and they have sought to identify the necessary logical conditions to produce the socially

consistent results without having to give up the postulate of the selfish maximizing agent. This methodological group has advanced slowly. But the neoclassicals also count on their empiricists, count on their historians, count on their institutionalists. And they begin to ask themselves about the social conditions that promote the overcoming of lose-lose results (dilemmatic). And the answer is: in equity conditions, horizontal relations, when the interest of each one is similar to the interest of others, they are leveraged to empathy, the trust and disposition of the collective solidarity action (not opportunist). The neoclassicism – that was constituted in the last third of the XIX century was what exactly to expunge the “socialist” elements of Classical Political Economy – and it was discovered a century later, that the distributive equity is an efficient condition of markets.

But the neoclassics are not, neither alone, nor in bad company. In the second half of the XX century, the thesis on the centrality of equity in emergence and consolidation of modern political institutions and in the promotion of economic development will be rescued by theories from all areas of human sciences. In the Political Philosophy, Rawls (2000) demonstrates the relationship among distribution equity, justice, and rationality. And Contemporary Sociology rediscovered the thesis of Tocqueville (1832) on the relationship between equality and civism<sup>1</sup> beginning in the anthological research by Putnam (1996) on the unequal development of the Italian regions in the 1970s and 1980s.

It seems to us, however, that among all modern arguments in defense of the potential equity impellor for economic development for the most original contribution comes from the modern theory of effective demand. Keynes knocked down the only allegedly scientific argument on the defense of inequality to reject the thesis on “the rising of the cake depends on the savings of the rich and

is based on distributive inequality.” As Keynes demonstrates in the General Theory of Employment, investment is not based on savings. An increase in the propensity to save unassociated to an increase in the propensity to invest and this brings about idleness in the consumer goods industry, keeping the income down until the savings is equal to the investment (defined separately from that). Kalecki is going to present the same Keynesian principle by paying attention to the positive relationship among the share of salaries in income, the size of the multiplier of autonomous expenses, the level of utilization of the installed capacity and the economic growth..

We are now bringing this research work to the public – sponsored by the Itaipu Binacional Technological Park Foundation and the Economy and Statistics Foundation – which is firmly rooted to the conception that inequality is harmful to social economic development while equality promotes this. And the importance in explaining this foundation thesis is based on the fact that it unfolds into two refusals.

We refuse to: 1) disassociate economic development from social development; and 2) the pretention on what equity defense is (or on the contrary, inequality) is exclusively based on political and ideological preferences which are impermeable to any scientific discourse. For us, the defense of equity is not a utopian or idealistic subject; it is not a mere preference.

Besides the thesis on multiple functionality of equity for social economic development, the work that now will be presented to the public is rooted in another equally simple thesis, which is also quite old, and it is also not yet agreed upon. But, differently from the resistance to the thesis is that equity is impelling, this second thesis is not rejected by ideological resistances. It does not hurt

powerful interests (not yet, as we have seen, it is not functional for the defense of the large enterprising groups). In reality, it seems to me that the main hindrances in accepting it are its great simplicity on the analytical plane, which contrasts to the complexity that is imposed on planning regional development.

The thesis we refer to here was announced formally for the first time in its entire format in the first three chapters in *Riches of the Nations*. But it has never become common sense in *Economy*. Overall, because it states something so childish as well as challenging: the national Economy is radically heterogeneous in space. Or to be even clearer: each region is a specific and distinct region. In such a way as there is no simple and univocal “cake recipe” for “regional development: As there is not just a single regional, but countless.

It is quite true that social economic development can despite extreme inequalities. Brazil – with its history of slavery and landlords and its present (and even presently) patrimonialist – it is, maybe, the greatest historical true demonstration of this statement. But this only imposes new and interesting subjects. How has Brazil been able to overcome the bonds that inequality imposes on its growth? What are the determining factors for national economic growth and why are they so powerful to be able to overcome the barriers interposed by chronic inequalities? What is the growth rate and would we be growing if the bonds of inequalities were not imposing powerful braking action? These questions – on national development – cannot be considered in this work, which speaks about regional development. But they are not absent in our horizons. As the national development is, always and necessarily, the main reference for measuring regional and local<sup>2</sup> development.

The complete understanding of this thesis involves the

adoption of a system of classification and hierarchization of distinct activities of the traditional sectorial system (based on a productive-technical root, as opposed to market relationships). When breaking away from the sectorial system – whose most simplest expression is the cleavage “agribusiness, industry, services” – and we have adopted the classification based on chains and departments – which allows us to differentiate impelling activities and reflexive activities – we have entered a new economic world. It is surprisingly simple and clear on the analytical plane. It is extraordinarily challenging on the economic planning plane. But, contrary to the subject of equity (which is much larger than the scope of this book), this discussion is, exactly, the object of this work. But it is not fitting, as, we have anticipated developments which will be exhaustively expressed throughout the work. Its announcement is already enough.

In conclusion, we would like to finish this introduction thanking those who have made this work possible. As it usually occurs, the number of people who have contributed in accomplishing this work is much greater than we can list here. But there are some names, we just cannot neglect. The fear of incurring injustice by forgetting someone, does not justify an even greater injustice of not mentioning the names who if we did not have their support we would not have arrived where we have up-to-now.

Before anything else, I would like to thank my great friend Herlon Almeida, who recommended my name for working on this project and introduced me to the team from the Itaipu Technological Park Foundation (FPTI). I also owe Heron the need for a general text and for his performance in publishing it as a book. Thank you so much.

The FPTI technical team deserves very special thanks. I do not know (and I will never know of) any other research institution

whose technical staff is so cohesive and uniform in terms of competency, intelligence, commitment to equity and social justice, comradeship, and disposition for the work. The President Director Juan Sotuyo is an absolutely unequaled part and he is the central link to this chain. Sotuyo is one of those people who refuse to get old. They keep on joyful, hopeful, confident, and willing to work and make changes as someone as those who are much younger. He contaminates all those who work with him with his energy worthy of an Itaipu. Thanks so much Sotuyo. Thank you Angelica, Jonhey, Thaisa, Marcel, Nelinho, Angelita, Fabriano, Fabricio, and Ana Carolina.

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Secondly, my friend Lucir Alves, who started the research with me and despite of his taking his doctorate degree in Lisbon – he continues being a privileged interlocutor. And thirdly, there are two people who are much more than just research assistants; they are friends and professionals in whom I place my complete confidence. I am referring to two Statistics students who work with me at FEE and they have read this book and made detailed comments. My objective is to produce something understandable and for non-economic people. I used them as “guinea pigs”. Thus, if the book were not as didactic as I proposed it to be, the blame is largely on Allan Lemos Rocha and Gustavo Thomas, for being so intelligent and extremely dedicated. Special thanks to both of them.

## Chapter 1

**Interregional Division and International Labor Organization (Absolute and relative advantages)**

Smith is not only the father of Economics, but, he is the father of Regional Economics as well. Nevertheless, the correction of his main theses on the theme of regional economic dynamics (the purpose of the next chapter) cannot be properly learned without first recovering, theoretical development which has just become prominent several decades after the publication of *The Riches of the Nations*: the theory of advantages as related to David Ricardo.

The “Ricardian” theory of international commerce is usually analyzed (and criticized) based on its liberal point of view on political prescriptions. But this is a grave error. In fact, the claim that international labor division (and interregional) can be efficiently defined, based on the market, which is such a simpleton type of thesis and as ideological as independent on the theory of relative advantages. This last statement, by the contrary, is one of the foundations of economic science. And this is the exact extent which is necessary for ramification and yet not obvious (in opposition to common sense) regarding the distinct patterns of circulation in capital cities and workers among countries and

regions. It is necessary to first introduce the pattern of absolute competitive advantage in order to understand this concept (as compared to merely relative advantages) which controls the interregional labor division.

Let's imagine a very simple economical model, following the Ricardo concept, which states that profit is proportional to the deployed capital and the latter is proportional to the sum of the salaries paid to workers which are directly involved in the production process of any "x" (given) goods/products, added to the salaries paid in the production of raw materials and inputs needed for producing "x" goods. If the profits are proportional to the capital and this reducible to salaries (which in turn, are proportional to the volume of manual labor employed), thus the **value of distinct goods is proportional to the quantity of labor involved in the production thereof**<sup>1</sup>.

Let's imagine there is a country with two regions, characterized by a great difference in the soil, temperature, rainfall, availability of navigable rivers, and potable water and availability of mineral resources and ore reserves. The differences are so accentuated, so all the goods can be produced in region "A" just by mobilizing a much smaller number of laborers than is necessary for producing the same output in region "B". Suppose that the salary is defined nationally and is uniform for the same professional categories. In this case, there would be a much greater number of workers and the deployment of a greater volume of inputs to cope with the natural deficiencies in region "B" whereas; there would be an increased cost of production in this region as compared to region "A". Thus, the inevitable result would be that region "B" shall undergo economic deflation (or even be economically non-productive). Its resources would **not** be mobilized in the productive process, until all possibilities were exhausted in the prospection/

production in region "A".

Now imagine that "A" and "B" are **not** two regions, but two countries. Imagine even another possibility, the workers in country "A" (whereas the productivity is greater) if the immigration of workers from "B" were prevented to curtail competition and kept their own salaries down. Likewise, the enterprisers in "A" would seek to impede the entrance of enterprisers going into "B", as to constrain any increased demand (and prices) in the cost of labor of the workers and inputs and thereby making demand increase (and keeping prices down) on the final goods. Let's imagine that the mobilization of workers and enterprisers was successful and the Government imposed restraints on the free entrance of immigrants and capital in country "A". What would happen in country "B"?

The intuitive answer is that "B" would import everything from "A". But, if this occurred, then "B" would produce nothing. And, without any production, there would not be any resources to pay for importations; thus it would be forced to produce everything, despite its lower productivity. Thus comparing these two diametric options – importing everything or producing everything – what would be the true answer to the question about the "Ricardo" theory?

Let's take a look at the "Ricardian" concept, in order to explore more deeply the logical ramifications of the answer to the above question, based on historical-empirical references. The referred countries in our example are Brazil and Argentina. Suppose that Brazil displayed greater productivity in all of its productive activities, therefore all the goods produced in this country displayed lower "absolute costs"; it is worthwhile to say, they could be produced mobilizing fewer laborers. Let's furthermore suppose that the production and the demand in both

countries were made up of only two products: beef and coffee (the latter was produced in the Argentinean roasting ovens). See Chart 1 below to see a summary of this information.

**Chart 1. Values and Prices of Beef and Coffee in Brazil and Argentina**

Goods	Brazil		Argentina	
	Labor Cost	Price	Labor Cost	Price
<b>Beef</b>	15 hours	15 reais <small>(Brazilian currency)</small>	20 hours	2 pesos <small>(Argentinean currency)</small>
<b>Coffee</b>	10 hours	10 reais	40 hours	4 pesos

Suppose, after all, the exchange rate from the Real to the Peso was, originally 10 Reais = 1 Peso. In this case, the Brazilian beef in Argentina would cost 1.5 Pesos (50 cents cheaper than the beef in their own country) and the price of the Brazilian coffee is 1 Peso (3 Pesos less expensive than the Argentinean coffee). In these conditions, Argentina would import both products from Brazil and would up give up its own production. As a result, the demand for Reais (the currency paid for the importations from Brazil) would increase in Argentina and the demand for Pesos would be nullified in Brazil, imposing an increased valorization of the Real.

Then imagine, as a result from these changes on the demand for Reais and Pesos, the exchange rate would be changed to something like 5 Reais per Peso (5:1). In this case, the beef produced in Brazil at a price of 15 Reais would cost 3 Pesos in Argentina, more expensive than the nationally produced beef (sold at 2 Pesos). Thereby, Argentina would go back to producing beef and export

it to Brazil, while Brazil expands its coffee production, to meet the national and Argentinean market demands.

In summary, these products are based on the exchange rate fluctuations<sup>2</sup> and they end up being priced in the national currency for foreign production, feasibility for productive specialization and exportation to the world market of **countries which display absolute disadvantages throughout all market sectors**. These countries are thus inserted in the international labor division, producing and selling goods at **lower absolute disadvantages**, it is worthwhile to say, that the goods which have displayed (merely) **relative advantages**<sup>3</sup>.

Despite, they have only been insinuated by the author, there are countless ramifications of revolutionary findings by Ricardo for theorizing economic dynamics, not only on the national level, but equally in **regions**. Then to begin with, the most important conclusion is that the **outlying nations (underdeveloped) depend on more measures in order to cope with perverse satellitization by way of more developed territories than outlying nations of a developed country**. While nations can employ such measures as the exchange rate, as customs embargos, and legal circumscriptions on incoming capital and immigrants, the regions do not have any control on equivalent variables, being induced to stagnation and, to limit the demographic depression and abandonment, when generalized absolute disadvantages are presented.

Apparently, Ricardo has not extracted all the pertinent conclusions from his own theory, because, at that time period, the process of capitalistic development had not yet generated the profound regional inequalities which began to be manifested beginning in the second half of the XIX century as would be the authors of that period – especially, Marx [(1867), 1996] and

Marshall ([1890] 1983) – who would theorize on the relative advantages applied to internal scales (large plants) and external (agglomerates)<sup>4</sup>. It is possible to quite simply summarize, the contribution of these two authors on the thesis that businesses and pioneer regions in the production of specific goods developed expertise and achieved perennial competitive advantage in businesses and new regions which operated on a small scale.

The recognition on the relevance of the contributions of Marx and Marshall on the theme would be redundant in the Myrdal theses ([1957] 1982) on the “circular cumulative causation”. According to this author, even in a region which did **not** display any **natural** competitive advantages (related to soil fertility, rainfall, waterways, etc.), if it is not a **precursor** in the industrial production of any “X” goods, it would end up “structuralizing” the competitive advantages before the other regions would be able to implement competitive productive systems. Myrdal proposed the consolidation of a center of enterprises dedicated to the production of a specific product to stimulate the setting up of companies focused on supplying inputs and industrial transport, energy, and communication services. The result would not only be structural cutting of costs in the production of “X” goods. As well as diverse activities provided communication vessels, quite often utilizing the same basic transport equipment, energy, commercialization, and R&D set up to serve the pioneer industry, as there was a growing trend towards the concentration of wealth, production, and income in a limited number of metropolitan centers, thereby making the remaining territory relatively subordinate (such as in the production of rural raw materials) and a low aggregate value.

The nations – whose relevant competitive advantages are merely relative – contain some economic political measures capable of circumventing the perverse effects of this change in the spatial

concentration of production. Yet in regions – submitted to the demands of absolute advantages – they would be doomed to restrain their production only to goods (necessarily few) which display absolute superior productivity<sup>5</sup>.

Another equally important ramification of the Ricardian system on the theory and the regional development planning was exploited by Albert Hirschman in his last chapter of his greatest work (which was absolutely brilliant and essential): The Strategy of Economic Development. In order for one to understand this point, it is necessary to understand that currency exchange adjustment makes it possible for currency exchange (transactions) to occur among countries with unequal productivity in order to **not** uniformly impact distinct regions in a more developed country. In reality, if we return to the former example, it is easy to notice that the Brazilian region is responsible for the beef production undergoing an economical deceleration after the currency exchange variation, and **the loss of dynamism can bring about the chronic stagnation if it demonstrates incapability in exerting an effect of a conversion on coffee**.

In order to place greater empirical-intuitive appeal on the previous example, let’s imagine that Brazil and Argentina originally produced 4 products – beef, coffee, iron ore, and wine – and Brazil displayed absolute advantage in all these products, yet Argentina held relative advantages on beef and wine. Based on a consistent system of currency exchange variation, the Argentinean wine and beef production arrived in Brazil at a **lower price than similar national products despite the fact that the actual costs were higher (then it can be said, although the production was mobilized with a greater amount of work)**. There is nothing the wine or beef producers can do to hamper this currency exchange adjustment. Now let’s consider, there was a given Brazilian territory (in the southern region, on the Argentinean border) which displayed **internal**

advantages in the production of beef and wine, but that region did not produce coffee or iron ore at competitive prices<sup>6</sup>. What would happen in that region after integrating into the Southern Cone Common Market (Mercosul)? The most probable effect would be its productive headquarters would be scrapped and become stagnated. This transformation **cannot** be halted by leveraging the **internal physical** productivity, unless the rise in productivity exceeds the Brazilian productivity difference in iron ore and coffee.

Just as Hirshman warned in the referenced text, there is only one way to escape from the stagnated trend in regions that portray edaphoclimatic characteristics and availability of ore resources similar to the external competitor: secession. Placing rationality (and, to the limit, explains) the (almost) movements of the gaucho separatists, such as **the “Farroupilha” Revolution and the Federalist Revolution**. **These movements are the reflection of productive differences which make “social recognition” unfeasible (due to prices controlled by currency exchange) on the competitiveness/productivity of the southern-Brazilian production of beef jerky, wheat, wool, dairy products, and wines.**

Evidently, the intention of the international division and interregional labor laws are not enforced in an inexorable manner. Yet, the following can be stated and comprehended: 1) no country can display **relative** advantages on all its products; 2) the enlargement of **absolute** advantages (productivity) in the production of any kind of product **cannot** be converted in the price advantages in international commerce, as well as a **relative** advantage; and 3) the economic integration of countries with distinct productive profiles leads to the disintegration of relatively less advantageous productive systems; and 4) this specialization has had distinct dynamic impacts (when not antagonistic) on distinct regions of countries involved in the process.

## Chapter 2

### The Determining Factors of Regional Economic

#### Dynamics

#### Region X Nation

As we expressed in the previous chapter on the Ricardian distinction among absolute advantages – defining aspects in the division of interregional labor – this is the first foundation of the Regional Economy. **Economic Sciences** already recognizes this implication (but **not** yet in other segments of Social Sciences), which states the **requirement** that the **region is a sub-national territory**. And what defines the **nation** from the Economic point of view is the existence of a specific organization – the National State (government) – which controls the flow (constraining the shipments entering from foreign countries and outgoing to foreign countries) of financial, material, and human resources. For this purpose, it depends on diverse legal, fiscal, and customs measures, among which the most prominent is the respective monetary unit and the capacity to exert an influence on the

relationship among internal and external prices based on the exchange rate. **Any State (Government) which of its own wish (voluntarily or not) employs controlling measures on the flow of resources on its neighboring nations and especially, loses its own monetary-exchange autonomy abandons compliance with its regulatory functions as a “nation” in the strict economic sense. And thereby as the territory becomes part of the monetary and customs unit, it loses autonomy in defining its own productive profile, being forced to produce only those goods which provide absolute advantages<sup>7</sup>.**

It is worthwhile to observe here that the claimed legitimate nucleus is found here (essentially mistaken) inasmuch; the advantage theory related to Ricardo is an eminently ideological construction. After all, a logical derivation of this theory is that **regional inequalities tend to be more serious and more difficult to overcome than international inequalities**. But in fact, this conclusion is strictly true only when it is backed by a very strong hypothesis: the hypothesis based on distinct nations that adopt institutional standards (which may be expressed as: cultural, political, competitive, etc.) or other similar ones. Now, this supposition is essentially unrealistic and can only be admitted within modeling exercises for strictly analytical purposes<sup>8</sup>. – and this is the point we wish to highlight – even when we recognize institutional differences as the rule (and not as the exception) and limit the positive exploitation of advantages (merely) related to the surrounding regions, there are still two conclusions which remain valid: **1) issue of regional inequalities is related to the distinct nature of international inequalities; 2) coping with regional inequalities is as serious or more serious than coping with**

**international inequalities.**

### **Related unequal development**

Ricardo, Myrdal, and Hirschman explain why regional inequalities are so persistent. But, it is not necessary to read the writings from these authors in order to become conscious of the seriousness of the problem. This conception has been disseminated by way of the recurrent national disasters in order to cope with regional imbalances arising from fiscal and financial incentives by establishing companies in undeveloped territories for the purpose of compensating for their relative higher expenditures<sup>9</sup>. Anyway, if we wish to go beyond this critical conscience, it is necessary to recuperate the **development** theme from the perspective which immersed in economic literature even before Ricardo; this is due to Smith’s perspective, the related inequality integration perspective. But let’s consider this.

The Ricardian theory on capitalistic development is quite well-known and corresponds, in essence, to modern common sense on the theme. For Ricardo the accumulation of capital (and in its broader meaning, economic growth) it is as compulsive for the capitalistic enterpriser, as consumption is for the worker. Whereas, two conclusions can be extracted: 1) it is impossible for global supply to exceed global demand, and therefore, it is impossible for the system to collapse due to super-production; 2) the only limit to continued growth in the system is the scarcity of natural resources (depletion of available land and the proximity of mines and increased productive demands). The only way to overcome the production limits defined by the scarcity of resources is by **technical progress in savings on labor and/or inputs** and by the development of **infrastructure**

in transportation (and other necessary services for production) which makes the economic occupation and exploitation of distant territories, in the geo-economic frontier. Therefore, there must be more effective government policies in promoting development of the transportation infrastructure (and other necessary services for production) to occupy and economically exploit more distant territories more feasibly in the geo-economic frontier. More effective government policies in promoting development, therefore would be: 1) promote technical progress through support in basic research (in Universities) and applied research (in “high-tech” companies, focused on the production of labor-saving machinery); and 2) enhancing the logistic infrastructure and industrial services of universally consumed public utilities, such as (electricity, communication, etc.)<sup>10</sup>.

The strength of the Ricardian model has been confirmed by its temporal resilience and by way of its disseminated acceptance in the broadest ideological spectrum. The claim to its development rests on the “natural resource” tripod (as 9 out of 10 contemporary ecologists shout that depletion will bring about a global crisis), “infrastructure” (focused on logistics, energy, and “information systems”) and “technology” (especially, for saving resources, including labor) which is just pure common sense. Ten out of ten non-economists (and not an insignificant percentage of economists) have adopted the simpleton model and the Ricardian program.

In spite of writing almost half a century before Ricardo, Smith wrote about a more complex concept on the mercantile development process. In the very first chapter in *Wealth of Nations* – in a clear anticipation of the cornerstone contributions of Marx, Marshall, and Schumpeter – Smith returns to demonstrate that technical progress is not the starting point, but the ramification of the developing process, whose origin lies elsewhere. But even

more specifically, Smith seeks to demonstrate that productive process innovations are ramifications of the deepening of the labor division related to the following measures: 1) expansion of the markets, opening space for the expansion of production, and the introduction of more specialized work patterns; 2) simplification and standardizing work process routines, and consolidating the expertise of workers and technical managers. In the consecrated terms as described in the neo-Schumpeterian literature, the Smithian innovation presupposes, simultaneously, demand stimulus (demand pull), and supply competency (supply push). And the supply competencies: 1) are achievements derived from work<sup>11</sup> (learning by doing); and 2) usually mobilize resources and previously existing knowhow, yet not presupposing any technical-scientific progress in the strictest sense of the word<sup>12</sup>.

Then in summary: by opposition to Ricardo’s technicism, the challenge developed for Smith – as well as demonstrated by Stigler (1951), in his classical study on this author’s theory -, it is the limitation (current and planned) on the local markets in adopting the most efficient production standards. As this is just

“the certainty to be able to exchange the excessive production, after satisfying their own needs, from the excessive production from other men who have been dedicated to a single task and developing and perfecting any talent or skill that person or persons may possess for a given type of activity” (Smith, 1988, p.14).

Now this certainty only exists in territories where the labor division has already reached a certain defined level. As:

“there are some types of industry, even the most insignificant,

which can only be developed in a large city. A freight loader, for example, can only find a job and the means to survive. A village is too small for that person to assure continual work” (Smith, 1978, p. 17).

In territories where the labor division is still incipient, the only certainty is the **inexistence** of a local continual demand at the scale and technology (usually, widely known, and easily repeatable) more efficient. In the words of the author:

“The existence of a specific business is impossible and not even manufacturing nails, in remote inland regions of the highlands in Scotland. A worker who manufactures one thousand nails every day, in thirty days of work would manufacture thirty thousand nails; yet in these regions, it would be impossible to send just one thousand nails per year, which is just one day of work” (Smith, 1978, p. 17).

In short: Smith considers the problem of development to be based on its own functional process. This relationship is expressed in this “functional loop” as summarized below:

Wealth = f1 (Productivity)

Productivity = f2 (Work Division)

Work division = f3 (Market Size)

Market Size = f4 (Work Division); therefore

Work Division = f3-f4 (Work Division)

Immediately, each observer is able to perceive the

inexplicit character of Smith’s problem. Without mentioning all the necessary analytical instruments to demonstrate his thesis, as he seeks to express an extremely complex problem: **the Nash concept on the existence of multiple interrelationship balances in a system where agents can adopt distinct productive standards of specialization (and, complementarily, omnipotence)**. And Smith opinion is that in uncertain conditions, the agents must favor a solution that maximizes the worst possible yield (max/min method), which makes the system converge on the minimum division of labor and productivity<sup>13</sup>.

The “functional loop” solution pointed out by Smith is equally inexplicit and analytically indisputable: the integration of outlying larger and already consolidated markets<sup>14</sup>. According to the author – this demonstrates a refined perception of historicity – this process takes place in an unequal and combined manner, resulting in the emergence of a hierarchy of territories. The following expresses Smith’s concept:

“It is possible to carry on a larger scale of commerce harnessing the waterways then by overland transport, then along the seacoast and navigable riverbanks all types of industry began naturally and then subdivide and develop; generally, this development only extended into the inland regions much later on” (Smith, 1978, p. 17 and 18).

Smith is not blind to the **possibility** of integration (emergence) to the outlying large urban markets to **ramify** into satellization. And this, especially, as the outlying markets tended to specialize, firstly, in the production which attributed (absolute)

advantages on the urban centers: agribusiness. And according to Smith:

“The nature of agriculture does not accept so many subdivisions of work and neither such an accentuated division among the different production segments as has been verified in industry. It is not possible to separate so precisely the work of the cattle raiser from grain growers, as in the case of the metal worker and carpenter. Thread spinning is rarely performed by the weaver; but it is usually done by the same men who plow the land, who cultivates, sows the seeds, and later on harvests the crop. As each type of this work takes place in different seasons of the year, it is impossible for a single man to be constantly employed in these tasks” (Smith, 1978, p. 8).

The reversal of the satellitization process depends, therefore, on the possibility of converting a system which was originally centered on specialization and exportation of agribusiness into a diversified system, and then most of the production will be focused on the internal market<sup>15</sup>. However, Smith considers that satellitization is nothing more than a possibility, and not strictly constituting a definite **trend**. And this is, above all, because Smith associates the maturing of capitalistic economies to the increasing depletion of profitable investment opportunities, whereas this provokes a growing supply channel of the excessive supply to the outlying regions<sup>16</sup>. This is also because Smith is quite critical in his perspective on the living conditions of the populations who live in outlying regions (and thus, extending to territorial inequalities) before the integration process. This allows for (at

least) the performance of an activity to become structured in the scale and technologically to maximize the productivity of the work, functioning as a catalyzer to promote the emergence of other mercantile activities in the territory, focused on serving the needs of those workers who stopped producing their own products for consumption.

Only in the XX century, after the systematization and further in depth application of the Smithian model by Douglass North, did it achieve the theoretical definitions of the technical-economic into distinct ramifications (autonomy X satellitization) of integrating the outlying regions. This is exactly the subject of the next section. But before going ahead, see the following two comments.

The first one is from Smith’s perspective on dialectic evolution. It is evolutionist because, the business centers, as well as the outlying regions regarding the interaction pattern among these areas, as they evolve as time goes on. And his perspective is dialectic (as it is in opposition to an evolutionist and mechanistic phases) as the results from this interaction are not predetermined. Despite, the presupposition of the outlying integration of the hierarchy and the heterogeneity since the beginning, the relationship pattern between the spatial links of the system can (and must) change; remain open, including, the possibility of inversion of functions<sup>17</sup>.

The second comment is the following – as Stigler demonstrates, in the previously referred text – the Smith’s economic perspective presupposes the recognition of: 1) the competitive system is imperfect and the businesses face a restricted demand (negatively slanted); and, therefore in 2) the search for new markets is a crucial strategy for overcoming bottlenecks of the current local and/or regional demand. In short: Smith’s point-of-view is much closer to the contemporary view, the Schumpeter and Keynesianism

inflexion, and the classic point-of-view of the Ricardian-Marginal inflexion. But, this is not just a mere intuitive and impressionist anticipation. When the territorial perspective was introduced, Smith introduced the new concept of dynamic modeling, whereas more preeminence was attributed to exportations than investments, while the variable autonomous expenses became dynamic forces on income. This is the objective of the next section.

### Exportations and determination of regional dynamics

Despite countless methodological and theoretical differences, Smith and Ricardo converge at a crucial point: regions (especially as Smith would say new or outlying regions) they are significantly more specialized than nations. Besides this, apart from considering the pessimist perspective (from LAEC and Myrdal) on the “cumulative circular causation” or a more optimistic perspective (associated to Smith) on the uncertainty related to the evolution of relationships among urban centers and outlying rural/suburban regions, in both perspectives, the production of machinery and capital goods tend to be concentrated in a few urban centers characterized by their elevated productive diversification.

In two weekly studies in the 1950s (North, 1955; North, 1959) the great master of the new North American institutionalism recovered the Smith and Ricardo theses on regional productive specialization and ramification logically (however without formalizing them) based on the Post- Keynesianism theory on income determination<sup>18</sup>. Below, we’ll formalize the North model in Keynesianism terms.

Let’s consider that the global supply is identical to the

global demand<sup>19</sup> and the supply corresponds to the gross national product (GNP) plus importations (M), if we classify the demand into the basic components – worker consumption (Cw), capitalistic consumption (Ck), capital goods for investment (I), Government demand (G) and foreign demand for exportable goods and services (X) -, see the following expression:

$$\text{PIB} + \text{M} \equiv \text{Cw} + \text{Ck} + \text{I} + \text{G} + \text{X}^{20}$$

Therefore, the Gross National Product is identical to the demand categories subtracted from importations:

$$\text{PIB} \equiv \text{Cw} + \text{Ck} + \text{I} + \text{G} + \text{X} - \text{M}$$

Now, everything that is produced generates an income (Y), whether the enterprisers who earn profits (P), or workers whose services are contracted by enterprisers in exchange of salaries (W)<sup>21</sup>, or the Government from collecting taxes (T). Therefore:

$$\text{PIB} \equiv \text{Y} \equiv \text{P} + \text{W} + \text{T} \equiv \text{Cw} + \text{Ck} + \text{I} + \text{G} + \text{X} - \text{M}$$

In the evaluation of the social product and the income are included above, the free services supplied by the Government, such as public education, health, and security. Yet, these services are provided universally, therefore based on this rule, it is possible to get a more accurate evaluation of the differences in the quality of

life and the potential for storage and growth in distinct territories when we exclusively focus on the monetary income made available to the citizens after paying taxes and whose allocation is exclusively defined by them. This portion is called “available income” ( $Y_d$ ). This agrees with the third equation above, so this available income corresponds to:

$$Y_d \equiv Y - T = P + W \equiv C_w + C_k + I + (G - T) + X - M$$

Up to now, we have covered the internal details of conventional (post) Keynesian modeling. But **North is going to introduce a radical innovation to this theoretical system in order to differentiate the propensity to import distinct variables of expenses**. Let’s take regional development as a reference for the classic theory – whose main conclusion is that the more specialized regions of the nations – North is going to differentiate between **regional** propensity to import the consumption of workers, from capitalistic consumption, from investments and (regional) exportations. At first (but still insufficient) approximation, North intends that the outlying regions (in the previously defined meaning: regions which have been incorporated afterwards into the mercantile system) importing the total amount of capital goods (machinery and production products, such as cement, steel, glass, etc.) and capitalistic consumption goods (luxury cars, fine fabrics, sophisticated food stuffs) and produce the goods locally which are their own specialties and export them to other regions ( $X$ ), as well as the goods consumed by the workers ( $C_w$ ). In this case

$$M = C_k + I; \text{ and, by extension}$$

$$Y_d = P + W = C_w + X + (G - T)$$

Let’s suppose now that the workers – consider the general class, and for right now not individuals – who were not able to save and invest<sup>22</sup>, therefore their salaries ( $W$ ) are completely allocated to consumption ( $C_w$ ). In this case

$$W = C_w$$

Let’s suppose that the distribution of income in the system is a variable which is quite stable<sup>23</sup>, therefore the participation of salaries in the income has been attributed a “ $w$ ” parameter, so that

$$W / Y_d = w$$

$$Y_d = P + w Y_d = w Y_d + X + (G - T)$$

$$Y_d - w Y_d = Y_d (1 - w) = P = X + (G - T)$$

After all, let’s suppose, the budget is balanced, so that the government expenses ( $G$ ) are identical to the collected tax revenue ( $T$ ). In this case:

$$G - T = 0$$

$$Y_d (1 - w) = X$$

$$Y_d = X + C_w = X + w Y_d = X / (1 - w)$$

**The last equation above tells us that the available income from the population in the outlying territories is based on only two variables: the value of the exportations ( $X$ ) and the distribution of income ( $w$ ). The role of exportations – which, just to remind you, is**

related to the production going to other regions in the same country or to other countries – this is clear: they are allowed to exceed the Smith’s “functional loop” and the specialization of a group of workers in mercantile activities. Based on the origin of where the development process takes place (as defined in the Smith concept) and this is the sole portion of the autonomous demand which generates income for the community (therefore  $P = X^{24}$ ), North states that activities focused on exportation as “basic activities”. We prefer to call them as **impelling activities**.

The purpose of the income distribution function is to define the level of internal multiplication of impelling activities<sup>25</sup>. The larger the percentage of salaries in income is<sup>26</sup>, the greater the stimulus is for domestic activities focused on supplying the consumption demands of the local working population. We call these activities focused on providing the local demand as “reflex or multiplicative activities”.

Now, the greater the multiplication of the impelling activities is, the greater the scales will be (and in the internal and outside economies) in the activities focused on supplying the local consumption demands. And then the possibilities will be greater for these activities to develop (new) impelling activities, inasmuch focused only on the local market, but also focused on supplying the external demands. **The distribution of income is the first determiner of an outlying economic trend in the satellization or productive diversification and growing autonomy**. Thus, more income is concentrated, few chances of the outlying economy overcoming the exportation of monoculture and entering the process of productive diversification and dynamic autonomy.

The second central determination of satellitization or diversification of the independence of the outlying regional

economies is to define an independent interlinking pattern (level of vertical integration) for the impelling activities in the territory<sup>27</sup>. In order to facilitate your understanding of this point, it is necessary to introduce a small complexification to the previous model. Previously, we had assumed the extreme hypothesis that the claim to import investments and capitalistic consumption were complete while the claim to import exportation activities and the workers’ consumption were void. Now let’s make this hypothesis gradually more flexible as we continue in this study. But we will abandon the claim that the totality of the exported goods is appropriate to the needs of the local producing agents. In reality, in order to produce the exported goods, it is necessary for some inputs to be usually produced in outlying regions; at least not after the integration process has started. Besides this, the regional production for exportation can take on diverse forms, depending on the level of local raw material processing in the territory. A forest region will have to develop some lumber industry. But it is not common to export dry lumber stems without any treatment, wood treatment, processed wood, or other wood products (furniture, for example). In formal terms, this involves changing the equation in order to define the available income ( $Y_d$ ) applying a  $\beta$  parameter to the exportation value, therefore:

$$Y_d = \beta X / (1 - w)$$

The  $\beta$  will be as large as the most integrated in the productive chain of the impelling activity. Only in the case of a set of inputs used in the exportation agribusiness production produced regionally, the  $\beta$  will be equal to the unit<sup>28</sup>.

It is important to understand, although, in this vertical

integration process (interlinking) and adding value, which is not based only on the maturation time of supply chains. This is due to the fact, that there are distinct raw materials (especially in agribusiness products<sup>29</sup>) that require distinct levels of minimum processing before shipment. Besides this, the inputs used in production or in processing of specific agribusiness products are specific and are adjustable to scaled demands and equally specific technological domain. And the result from these differences, it is increased or decreased internalization in the outlying region of the specific links in the productive chain being exported. Some empirical examples will facilitate your understanding of this subject matter on North.

Rio Grande do Sul is the most meridian state in Brazil and its historical development has been (and still is) associated to distinct agribusiness supply chains which thrive in distinct parts of that territory, such as steer raising and rice paddies on the plains (mid southern region), the tobacco crop in the German colonies in the central valley region, the grain crop (soy beans and wheat) in the northwestern plateau region, and the grape and wine production in the northeastern mountainous region. These distinct specializations have resulted in equally distinct processes in the vertical integration of the agribusiness production. So, let's consider the following.

Considering the singular character in the hilly lands of the northeastern mountainous region, the natural productive option has been permanent agriculture. The edaphoclimatic characteristics of the region and the culture of the first settlers (Italian background) wine production has been consecrated as the main productive option since the first years of their settling in the territory. Since this fruit is especially fragile, it cannot be transported in natura along the existing overland routes at the beginning of the XX century. Then this

forced them, since the very beginning of the integration, to develop a **wine-making industry**, focused on processing and adding value to the agribusiness exportation product. And as the main inputs in the wine-making industry are (cuttings, hoes, trimming shears, wooden barrels, etc.) they were all produced by their own craftsmen (it is worthwhile to say: in a relatively small scale) **the mountainous production promoted premature specialization of relatively diversified agribusiness industry**.

Approximately in the same period, the German colonies in the central valley region (situated between the towns of Agudo and Venâncio Aires and surrounded by Santa Cruz do Sul) and the tobacco crop is here and holds a preferential niche in the mercantile insertion. And there is no space for doubt on the profitability of this activity at the beginning of the XX century, and this was even more profitable than the mountainous wine-making production. Notwithstanding, there was a bottleneck in the productive diversification process of this territory. And this, mostly, due to the production characteristics of the tobacco crop made it unfeasible to internalize the territory in the main links leading downstream and upstream towards the tobacco production. The final links (the production of cigarettes and other related products) tend to be located around the surrounding areas of consumer centers, due to the purpose of reducing transportation costs<sup>30</sup>. And the main industrial inputs utilized in the production of tobacco are chemical compounds which are benefitted by the scale and tend to be located in industrial zones in urban centers, equipped with multimodal logistic systems.

The internalization of distinct links in the supply chain and productive diversification in the grain crop region in the Northeastern Plain region has not been as successful as the tobacco growing region. In reality, the upstream integration has been very

successful, with the emergence of a dynamic machinery sector and agricultural tools and equipment. But the downstream integration was surrounded by soybean market characteristics. Soybean is a very flexible grain, and thereby it is possible to harness it in a variety of ways, so usually, buyers prefer to purchase it *in natura*. Besides that, the most common products in soybeans – such as oil, soymilk, protein, and bran for animal feed – incur higher cost than the bulk soybeans itself. These factors make it difficult to add value to the downstream, as the buyer only accepts to purchase the processed soybeans if the high prices of transportation are covered by the seller. As this usually makes any attempt ineffective to add value to the basic bulk product.

Evidently, revealing the relationship among the distinct productive chains characteristics and the vertical integration processes in the outlying territories, North does not intend to “technically” define the successful or unsuccessful diversification of the outlying production. On the contrary: **the identification of the technical circumscriptions on the internalization of the initial and final links of a given productive chain unveils (another) insufficiency of the market while the equitable and balanced integration measure of the outlying regions on the dynamic production centers and reinforce the need for government planning.** It was this market that impelled Santa Cruz do Sul and the Northeastern Plains to specialize in the tobacco and soybean crops. Based on the perspective of North, it would be fitting now for the government agents to promote, in a conscience and well-planned manner to diversify the production in the market which has not been clearly shown what they are capable of achieving.

Nevertheless, the Smith-North system is not **part** of the appeal to the Government how the Myrdal or Perroux exogenous models. Its starting point is the claim that the integration of the

outlying regions on the dynamic production centers usually is by way of market stimuli and, therefore, there is no need for government subsidies. And not even if it is possible the intention to export – as it is an autonomous expense – which is defined exogenously. Just exportation is strictly autonomous related to the internal income of the region<sup>31</sup>. But, contrary to the investment – which is defined exclusively by the importing company – the **exporter is also, a decision made by the seller.** Not free-of-charge, Schumpeter classifies the conquest of new markets as one of the five fundamental innovations.

After an exporter base is defined, the economy will go through a diversification process based on the internalization of activities focused on serving the consumption demands of the local population **which will be as good as the best distribution of income and wealth to the outlying territories.** Which is once again, behaves based on the options and political decisions and endogenous strategies.

And to conclude this model is that, even if the initial specialization circumscribes the vertical integration of the productive chain and the emergence of new products for exportation, as long as the second step (diversification of consumption) has been implemented for enough time in the outlying region to provide enough financial and human resources to **plan and administrate the diversification** of its exportation planning based on the identification of alternatives with the best long-term impelling power. It is worthwhile to say, **the Smith-North analytical system is, strictly, an endogenous development system. In reality, from our point of view, it is the only theoretical system of regional development that deserves, genuinely, this characterization.**

## Chapter 3

**Consistent regionalization with endogenous territorial development planning****The Problem of Changeable Area Units**

The perception that referred spatially statistics are a function of the division pattern/territorial aggregation chosen by the analyst is as old as the spatial studies themselves. The entire fourth chapter of Political Arithmetic by William Petty ([1690] 1983) is dedicated to demonstrating how the comparison between the English and French kingdom territories is not a trivial issue, depending on the option for aggregating (or not) first the territories of Wales, Scotland, Ireland; as well as the option (or not) to aggregate the territories from the two kingdoms, their high-sea colonies (many of them did not have well-defined borders). Likewise, Petty reminds us that, depending on the consideration of the territory, regarding the absolute measures of wealth, as well as relative measures (per capita or based on the area) selected to compare the two countries varied significantly, and arrived at diametrically opposed conclusions<sup>32</sup>.

Even being very old, the consciousness of the problem

of statistical variability (and dependability) obtained from the changeable **units**, the theme would only become the subject of systematic research beginning in the middle of last century. In 1950, Yule and Kendall proposed the differentiation of the statistical analysis systems in two groups based on the standard of units that account for the target study population: 1) natural and indivisible; or 2) artificial and capable of clustering or subdivision. According to the authors, the natural and indivisible units – as, for example, the individuals of a given form of animal or vegetal life – they would have to present more stable distribution patterns and stricter distribution constraints. Artificial units are different – such as, for example, towns, regions, and nations – present unstable, asymmetric, and heterogeneous distribution pattern, with greater probability of outliers occurrences, it is worthwhile to say, individuals who are far from diverse standard deviations of the value of the average population. Thus, the difference between the shortest man in the world (0.56 m) and the tallest man in the world (2.72 m) already registered is not 5 times taller, the difference between the smallest population of a town in Brazil (Borá, has a population of 805 in 2010) and the most populated is (São Paulo, as 11,244,369 in the same year) is almost 14 times greater. And then, the spread of the differences in height is normal, but the number of highly populated cities (the metropolises) is much smaller than the number of cities below average, therefore the distribution is notably asymmetric to the right and presents bi-modality characteristics<sup>33</sup>.

The open debate on the distinction of statistic systems proposed by Yule and Kendall was extremely productive. Including as the proposals for coping with the tendency for instability and abnormality of distributions using individual measures to theoretically show inconsistencies. The authors themselves have started to carry on a contemporary debate to find a solution which was proven to be wrong: favoring, as much

as possible on natural individuals being analyzed socially. Thus, for example, the distribution of income must be analyzed, based on individual income, as opposed to the income of a group of individuals. But if we adopt this strategy, the dependents of a family, who are not measured in the monetary income, they will be classified in the same group of autonomous adults without income (unemployed and without unemployment salary or any public or private welfare aid), regardless of the fact that the first group is granted access to a broad set of guaranteed goods by the income in the country. And this problem becomes even more complex when it is focused on a group of families, as compared to the family or individual units. And this is, since the beginning, our focus in this study: the heterogeneity of the quality of life, income, wealth, growth, and the development of **territories**, as opposed to individuals and families. In this case, the analysis units are, by definition, artificial and changeable. Therefore the distributive patterns of the territorial statistics must be characterized by great instability and abnormality.

The complexity of this issue only clearly surfaced in 1979, after the publication of a canonic research work on two British geographers, Stan Openshaw and Peter Taylor titled: “Around one million correlation coefficients: three experiments on the problem of changeable area units”. In this study, information on the USA electoral justice was collected on the percentage of votes for the Republican Party in the 99 counties in Iowa during the 1968 congressional elections. This information was correlated to the percentage of the population over 65 years old in each county. The positive and significant correlation was displayed and the measured value was 0.3466; that makes us conclude that the Republican Party displayed lower electoral performance in counties where the elderly population was higher.

Seeking to evaluate the impact of adopted regionalization on the statistical results, the authors setup a program that generated all the aggregation possibilities in the 99 counties in a minimum of 6 and a maximum of 72 areas and calculated the correlations between the elderly population and the percentage of the Republican votes. As one would expect, the correlations **varied** depending on the pattern of the aggregation in the areas. But the variations exceeded the expectations. In Chart 2 below, the lowest and highest correlations are displayed which were found in the distinct numbers and patterns for the grouping in the 99 counties in Iowa.

In reality, the results collected by Openshaw and Taylor demonstrate that the same database submitted to distinct patterns of territorial grouping generate antagonistic results. If the 99 counties are grouped in only 6 zones (adjacent or not) the correlations fluctuate between a minimum of -0.999 and a maximum of 0.999. Then to sum it up: just **regionalize “goods” to obtain the most convenient statistical results.**

**Chart 2. The Highest and Lowest Values for the Correlation Coefficients**

Number of zones or groups	Adjacent Zoning System	Grouping without being Adjacent		
	Correlation	Correlation		
	Minimum	Maximum	Minimum	Maximum
6	-0,999	0,999	-0,999	0,999
12	-0,984	0,999	-0,999	0,999
18	-0,936	0,996	-0,997	0,999
24	-0,811	0,979	-0,994	0,999
30	-0,770	0,968	-0,989	0,999
36	-0,745	0,949	-0,987	0,998
42	-0,613	0,891	-0,980	0,996
48	-0,548	0,886	-0,967	0,995
54	-0,405	0,823	-0,892	0,983
60	-0,379	0,777	-0,787	0,983
66	-0,18	0,709	-0,698	0,953
72	-0,059	0,703	-0,579	0,927

Source: Openshaw e Taylor (1979), p. 130.

**Development and crisis of the Modifiable Areal Unit Problem (MAUP)**

The initial impact from the work of Openshaw and Taylor was very great. It was especially important among geographers, statisticians, economists, and sociologists who – following the Petty concept – since it reflects the tax biases due to the regionalization of the social-economic statisticians. For these,

the strict and exhaustive demonstration of one of the same data systems processed in distinct patterns of regionalization can generate a **diametrically opposite** statistical system redefined by the terms of the respective research studies. In homage to this work, beginning in the 1980s, all the potentially imposed biases by the regionalization pattern on the spatial statistics began to be treated as distinct manifestations of the “MAUP”, this acronym was created based on the referenced subtitle of the research work by Openshaw and Taylor<sup>34</sup>.

There are countless modern developments in modern theoretical production on MAUP and we wish to especially recapture one conclusion, to structure our proposal in coping with this problem. Even though, there has not yet been an exhaustive nature of this classification, several authors have paid attention to the need of differentiating between two basic patterns in the problems associated to regionalization: the problem of aggregation (collect data from which scale?) and the problem on partitioning (which is the most adequate territorial division?<sup>35</sup>). Each one of these problems focuses on the inferences in a **distinct way**. The imposed bias as it inferences partially on the complete statistical base, we shall call it a “climbing fallacy”. The bias imposed by the aggregation of the inconsistent areas (essentially heterogeneous), we shall call it an “ecological fallacy”<sup>36</sup>. It is worthwhile to analyze these two problems more in depth. We shall start on the subject of the climbing fallacy.

As you know, the per capita income in big demographic concentration cities and where there are industrial systems and highly complex services (metropolitan regions, for example) usually exceed the per capita income of smaller towns and eminently rural areas. Although, more populated towns and more diversified economies also tend to present greater

internal inequality of income, whose geographic expression and emergence of neighborhoods (or satellite towns) tend to have a lower per capita income average and much lower per capita income than privileged neighborhoods due to elite economic classes (or suburbs, where political autonomy can be obtained and thereby constitute new municipalities). In these cases, it is necessary to avoid any inferences extracted from aggregated information from a part of all the information, even when the standard deviation is known. The ideal concept would be to depend on disaggregated statistics, which will be confronted by aggregated statistics in order to have a richer apprehension on the “entire and the separate parts”. It is important to understand that the inferences on the entire concept and the separate parts must be based on specific and differentiated statistical data.

This so-called “ecological fallacy” is also referred to in the aggregation problem in unequal sub-regions. But this is different from the previous one in one crucial point: while the macro-region of a scaling fallacy is (let’s say) “legitimate”, the aggregation of the “ecological fallacy” is wrong. This example can help you to understand the distinction. Let’s image a town where all the citizens are completely integrated to the economic order and the politically dominant are all literate, but there is a “Quilombo” (Maroon-extremely poor) community there that makes up 20% of the population, whose members are not given any formal education, so almost all of them are functional illiterates. Then to state that 20% of the population of that town is illiterate is considered as an “ecological fallacy”. The misconception is considering that a unit is essentially formal (the area in the town) as a well-functioning unit; however the fact is that the two communities are reciprocally unrelated and essentially distinct.

This distinction is indeed important. But it is not mutually exclusive: the intersecting area (or transitional) between the scaling and ecological fallacies is quite broad. Let's take the last example as a reference. If the elementary education is mandatory by the city government, the statement that 20% of the population is illiterate in the territory is merely formal, but real: it is the responsibility of the group of towns to face this challenge as a community so that that respective group can be reintegrated into the social body.

The ramifications of this ambivalence can be better understood as a new example. Let's imagine a territory which includes four urban centers, whereas the majority of the equipment and health, education, leisure, transport, and energy services are concentrated. Imagine that this territory is divided into four regions, whose names are "A", "B", "C" and "D". In the two "Map-Charts" below, we have reproduced the layout of this territory. The asterisks symbolized the urban centers and the regions are symbolized by their "letter-names" associated to distinct background tonality.

In the first Map-Chart, all the urban centers are concentrated in region "A"; in the second Map-Chart, we have redefined an area covered by each region in such a way as that each one of them goes through an urban center, which provides the most diverse services. On the first displayed map, the regional inequality is extreme. In the second one, the four regions are equally supplied by the urban systems and services, and the regional development displays perfect homogeneity. **The antagonistic conclusions do not result in any relocation of the economic activities, but just redefine the regional diversion.**

### The Effect of Distinct Regionalization in the Same Territory Based on the Spatial Equipment Distribution indicators

Source: Ávila and Monastério (2006)



Subtitle: words A, B, C, D = regions; \* = urban center.

Source: Ávila and Monastério (2006)

Here is a visual representation of MAUP and it is simultaneously a synthetic expression of its importance and the ambiguity of its logical and theoretical ramifications. Right away, the problem is obvious on the above "partitioning" example. However, there is no way to define which partition is adequate and which is deceptive. Yet, this is not everything. The most important is that there is no way to guarantee how – despite the appearances – the problem is the background is scaled and it does not show how the researchers did not consider the resultant macro-region made up by "A + B + C + D" as an actual region. It is worthwhile to state: perhaps, the problem involves the **wrong** pretention which states that all the urban equipment complexes in Region A (Map-Chart 1) exclude and are pernicious to the users in B, C and D; when, in fact, this cannot be the case<sup>37</sup>.

**The distinction between the scaling fallacy and the ecological fallacy implies a distinction between macro-regions consistent and inconsistent (aggregations including smaller**

**regions**). And in such a way as to even more generally, the respective “fallacy” category implies the possibility of breaking down spatial statistical information based on its adapting to the reality and/or capacity to translate some territorial “essence” or “truth”.

Here, it is hard to find a less appropriate time period for the diffusion and consolidation of a classification project and defining the hierarchy of the “deceptive” and “non-deceptive” regionalization than in the 1980s. This is precisely, the decade of the Keynesian and socialistic planning decade, which for further explanation, it was a decade when neo-liberalism began to hegemonize in the political and economic field and the post-modern deconstructionism gained predominance in the academia. In the midst of these crises and critiques, which is particularly a theme that was revealed due to the technocratic planning in the 1960s and 1970s, which will be banned from the academic and political schedules: the search for scientific regionalization of the territory that considers the planning of government action and spatial distribution of entities, equipment, and representations of the Government<sup>38</sup>.

In an article titled “The identity and representation: elements for a critical reflection on the idea of regions” Bourdieu summarized the new critical discourse. Recuperating the common etymology of the terms govern, make rulings, and regionalize, Bourdieu states:

The regio and its borders (fines) are no more than an erased trace of the act of authority which consists of circumscribing the region, the territory (which is also called fines), and in defining the definition of (the other

meaning of finis) legitimately known and recognized as the borders of the territory, in short, the principle of legitimate division of the social world (Bourdieu, p. 114).

The fact that an author who was so resistant to the changing trends as Bourdieu, virtually identify regionalization, exercising power, and ideology reveal the level of discredit that the project got to and founded the regional division for the purpose of planning on scientific bases.

In the appearance plan, this critical movement is diametrically opposed to the identification of MAUP and the classification on the fallacies of regionalization. And, in fact, there is tension between the two perspectives. But this tension is far from being unbearable. And this is because **the geographies and statistics that made MAUP be created and classify the biases on the distinct regionalizations imposed the distinct statistics which did not achieve any agreement on its positive agenda**. It is worthwhile to say: they demonstrated that adopted regionalization influences the results and logically explored the biases and possible fallacies. But they did not supply a single argument to favor one regional division method more than any other. In the limit, all the methods are equally good or equally bad. All of them are biased in one way or another.

Here, this is exactly the conclusion we wish to arrive at to identify regionalization, exercising power, and ideology: there are no regionalizations which are more legitimate than any other; all of them are the mere exercising of domination. And if it arrives at the same place by way of an easier path (and apparently richer, this defines the impossibility of a solution), then why follow the tortuous path of statistical test focused on distinguishing and classifying biases?

The result of this surprising conciliation of opposites was the critiques on regionalizations on its ideological dimension which relieves one from the requirement to understand, comment, spread or publish the MAUP. Therefore, the majority of new geographers, regionalist economists, specialists on regional development, and government politics continue concluding their college degrees and post-graduate degrees, without making contact with the extraordinary research program which will be developed to seek answered to this intriguing problem.

### A proposal to cope with MAUP from North and Marshall

The hegemonial sisters – post-modern and neoliberal – were not able to silence the planning defenders. Even cornered, Marxists, Keynesians, and heterodoxies of all shapes and sizes continue to ravage the gates and walls of the new consensus on countless fronts. But they were not able (and did not even try!) to defend scientific regionalization. Why?

Apparently, the answer is found in the fact that the proposal for regionalization was dominant until the era of the 1970s, effectively, technocratically, and ideologically. In reality, despite the true reverence for Smith, the return to his theses on North was never acceptable by heterodox methods. Especially, the defense on the centralization of agribusiness exportations and the belief in the possibility of overcoming the satellization polarization which sounded too orthodox for any Latin-American educated in the LAEC tradition. And France offered to provide a regionalist whose propositions seemed to be more consistent with varied heterodoxies, such as Marx to LAEC, passing by Keynes and Schumpeter: François Perroux.

We have already mentioned how the Perroux theses (especially, when integrated with the Myrdal theses) have directly defended the Exogenesis defenders of “modernization” in the backward regions. It has also been pointed out the fact that this construction culminates directly in the identification of cities as the nucleus of a development motor. It is fitting now, to present the “scientific” regionalization proposal of this tradition: defining polarized areas nearby urban centers inside any gravitational model and hierarchization of cities.

This proposal of regionalization is not only simplistic. It simply suppresses the difference in the determination of regions. All of this becomes a issue on quantity: the number of people, services, equipment, communication, trips, etc. The most ironic thing is that the simply quantitiveness of the model is transformed into the main argument for its universalization: it is appropriate anywhere and it is always the same wherever it is. Of course, we consider this here as a basic principle of the system. This must be adjusted in each individual case. But here, it is possible to find the essence of the problem: **everything added to the basic principle is contingent, circumstantial. There is only one universal principle: the hierarchy of the cities.** After all, the city is the center of reflection, research, politics, services, leisure, commerce, exchanges, integration, industrial production, transport, technology, and everything else.

It is easy to notice that the conclusions are extracted from the endogenous regional development in the Smith-North model which is very distinct. Right away, as it is linked to agribusiness (and, by extension, rural) it recuperates the centrality of this model. For North, it is not possible to evaluate the dynamic nucleus of a territory based on the participation of distinct activities in the GNP. A territory whose agribusiness GNP corresponds to 10%

(or less) of the total amount, the industrial GNP corresponds to 40% of the total, and the service GNP the remainder, then it is possible for its dynamic nucleus in agriculture. This will be the case whenever services are integrally focused on supplying the local market (multiplicative or reflexive activities) and industry is then divided into two parts: one focused on the local market (for example: bakeries, clothing, etc.) and which benefits the local agricultural goods for exportation. In this case, the last equation in the North model shown in the previous chapter takes on a specific format: the value of “X” is identified as the value of the agribusiness raw materials and the “ $\beta$ ” parameter is attributed values over the unit apart from the level of integration for the upstream, as long as the integration for the downstream (processing) is significant.

$Y_d = \beta X / (1 - w)$ ; where as  $\beta > 1$  and  $X$  = value of the raw materials.

The advantage of this interpretation of the model is that it allows us to define the scope of the outlying regions (as opposed to the large metropolitan centers, that makes up its own region and functions as centers for a large territory) and based on the relationship between the rural production and the urban processing. This is how North proposed this concept:

For the proposals **of economists**, the concept of a region must be redefined, in order to stress the unifying cohesion of a region, **above and beyond the geographic semblances** [physical], is its development based on common exportation. This is what makes it unified economically and linked to the wealth of the

area. This tends to result in development interrelated to **external economies** in the region and **unify political efforts** seeking governmental aid or reform [of political institutions]. The geographer emphasized the **distributive functions of the central nodes** in a region, but the role of the central node in supplying the external economies for the exportation industry is equally important. (North, 1954, p. 312. The comments in bold are mine. )

There is an entire set of true findings in this short passage. Firstly, North explains the most important point: **the economic regionalization does not exclude, neither is it submitted to other regionalizations which may be equally valid, due to its own specific proposals**. It does not propose the “correct” “a” regionalization. It only seeks to **propose the regionalization to minimize the risks of undergoing an “ecological fallacy” in the identification of driving forces for activities**. For example: the **economic** dynamics of the previously mentioned Santa Cruz do Sul is directly linked to the dynamics of the tobacco industry. Likewise, the dynamics of each town/city around it produce raw materials linked to the dynamics of the others and the Santa Cruz center. This allows us to identify a “tobacco growing region” and the dynamics where there is profound solidarity<sup>39</sup>.

Then, North highlights the fact that the economic region is not familiar with physical homogeneity (neither could it, considering the fact that agribusiness specializations are self-linking), but this is not **directly** part of this. There are other potentially legitimate regionalizations which be based on these indicators. For example: the hydrographic basins seem to be the natural starting point of an environmental regionalism and must be organized into a

management and inspection system to verify the usage and abuses of the environment. This does not mean that we must submit all regionalizations to hydrographic basins.

On the other hand, the recognition of the multiplicity of “non-fallacious” regionalizations is articulated based on the dialectic recognition of links between economic regionalization and non-economic regionalization variables. Thus, North highlights the importance of geophysical aspects in basic productive specialization, explicitly recovering the common political interests of a territory that joins the same productive base and recognizes the articulating functions of the urban centers in supplying the most diverse services. But by recovering the centers, this introduces another demand on the traditional system of the urban gravitational hierarchy: **so that the centers articulate productively with its outlying regions, providing inputs, and raw material processing**. The centrality of this contribution is based on the fact that it provides new opportunities for a fundamental distinction among regional centers and multiscale centers (or without a region). The first ones are processing centers and service supply centers to specific productive surroundings. The second one serve distinct regions and they can be linked to distant territories as strong as or stronger than the surrounding itself<sup>40</sup>.

Finally, North mentions the need to think about economic regionalization not only based on the current reality, but also the possibilities of the regional trajectory made available by external economies. North is anticipating here, the recovery that was going to be done in the 1980s based on the Marshall-Allen theory of industrial districts and repeat the endogenous development project based on the Local Production Arrangements (LPAs).

This must instigate the regional studies during the 1980s

to be marked, simultaneously, by the technocratic project crisis of regionalization and by the restarting and developing the Marshall Theory on “intelligent territories”. After all, the two developments go in opposite directions. While, the first one flows towards the pretension of Bourdieu, which states that all regionalization shall be an imposition based on ideological constructions, the second one flows on the pretension that regions, which are far to be abstractly built, would be “artificially real units”<sup>41</sup>. The most interesting thing is, despite this inner contradiction, there are analysts who abide by both perspectives. How is this possible?

Immediately, there are analysts whose commitment to fashion (and they all prefer) it is at the same level as their lack of commitment to logic. But even if we put these sad figures aside, it is still possible to find those who intend to agree, simultaneously with Marshall and Bourdieu. How?...

It seems to us that the starting point for answering the previous question is found in the possible distinct interpretations of the “territorial intelligence” category and the distinct possibilities of hierarchization of external economies and their impacts on long term development. After all, the exogenous patterns of Perroux and Barquero are entirely based on externalities generated by the centers and innovative activities. But to these authors, the externalities will be much more relevant for the territorial development then the more universal were: logistic equipment and generic communication, R&D centers, Universities, Technological Parks; after all, everything that supports a milieu inovateur in an overall and general manner, with a minimum of embedding products and “traditional” supply chains.

**Differently than Smith, Marshall, and North – as they are all from Anglo-Saxon and Protestant analytical background –**

**doing and knowing are inseparable.** Innovation is a ramification of knowledge; but real knowledge, which is operative, transforming is a ramification of activity, work, and production. For the Anglo-Saxon Protestant and the empiricist learning results from doing<sup>42</sup>. Therefore, for the Anglo-Saxon tradition, the intelligent territories are the territories characterized by dedication to some well-defined activities. In the words of Marshall, when any given territory specializes in any given activities:

“the secrets of a profession stop being secrets, and are free in the air, in such a way as children absorb a great number of things unconsciously. Appreciate a job-well-done properly, immediately discuss the merits of inventions and improvements in machinery, in the methods and general organization of the company. If a new idea is created, it will be immediately adopted by others, who combine their own suggestions and, thus, this idea becomes a source for other new ideas”. (Marshall, [1890], 1982; p. 234).

As Marshall knew this very well, these nuclear activities demand input and processing, feeling the diversification of the productive fabric in a network of activities associated to great complexity; some of which present potential that can be applied quite generally. But the nuclear dynamic mechanism of the system, the heart of the “social machine”, is not found in the universally used equipment (for example: logistic or communication systems) or on the frontier of university scientific research. The fact of these impelling activities are organized in systems which are

becoming more and more complex – based on the format of chains, productive arrangements, and local production systems - **not** necessarily implicit (despite the exceptions) in the overcoming of regional specialization. According to the perspective of North and Marshall, the same regional systems whose diversification is very extensively, usually they continue to rely on nuclear activities. And these activities – are integrated vertically to the primary productive systems – they will define the extension, the mode, and the territory dynamics. They will define the economic regions. They define the partitions and legitimate aggregations (in the economic plan), in opposition to the fallacious.

## Conclusion

The study performed by Openshaw and Taylor flung open a door that always was ajar and through that opening many peered through it. Everyone who glimpsed in the inside of the alcove could know the asymmetry of the relationship between statistics and regionalization. The first was dominated by the second. They also knew that the only way to control the reigns of the region in the results was controlling the respective regional division. And, correctly, these analysts criticized those who gave up any questioning on the pattern of regionalization. Three years before the revolutionary experiment of Openshaw and Taylor, William had already stated the following:

“No statistician who is worth his/her salt would take an arbitrary group of individuals as his/her sample for a study, without questioning afterwards the selected criteria. Likewise, **we know the time will come when**

**regional scientific researchers who produce improvised zoning systems will end and who operate them without any conscientiousness of the implications of grouping on the end results of their investigations”** (Williams, 1976, p. 143; the bold comment is mine).

Unfortunately, the wish announced by Williams did not come true. Therefore, nowadays, as well as forty years ago, regionalizations continue being created without planning. And there can be no difference. The real source of the problem seems to be the fact that the **MAUP research program is based on a grave mistake: the expectations that a solution could emerge from “regional scientific researchers”**. But this cannot happen. We do not expect that these researchers conclude a unit. We do not expect any (geographers? statisticians? economists? environmentalists? planners? educators criminalists? sociologists? researchers, based on any “scientific” methodology must produce the “a” correct regionalization. This is the program of exogenous technocrats. This fetish has to be banished.

**The issue of “non-fallacious” realization is not an issue that can be considered separately from the specific purpose of the regionalizer. Economic regionalization is singular. Environmental management regionalization is another. The most appropriate regionalization is health management, or education or public security are others, thirds, fourths, and fifths.**

North sought to demonstrate, if we seek to monitor/project/plan/ the economic dynamics of territories, **pertinent regionalization will recover the determinations of the regional economic dynamics**. And these are: 1) the number, spatial distribution, and the growth rate of the impelling activities in any

given territory; 2) the distribution pattern, local absorption, and income destination of the territory; 3) the technical characteristics of the activities and productive supply chains are impelled (or circumscribed) the densification and complexification of the regional impelling supply chains and its transformation (or not) in the Local Productive Arrangements; and 4) the capacity of the enterprising leaders and workers who actuate in their activities (and/or supply chains; and/or LPAs) impelling and multipliers to recognize the challenges brought to the development of the territories and articulate the necessary measures/instruments to overcome these respective obstacles.

This last dimension – referring to the political conscience that the territory has of itself – from the pertaining economic regionalization is the most complex to evaluate. Fortunately, it is preceded by quantifiable dimensions. And the fact in the fourth dimension is not strictly quantifiable, which does not prevent its appropriation and empirical evaluation. It is shown to be required to measure the measurable and as it can be evaluated empirically, the incommensurable inside a strategy of endogenous regional development planning, which is the second objective of this research study.

## Chapter 4

**Seeking Relevant-Territory: Principles of Dynamic Analysis  
and Territory Structure-Focus and its Surroundings****Introduction: territory-focus X relevant-territory**

The biggest challenge in planning territorial development is to identify the relevant territory for analysis. It is extremely important to acknowledge that this challenge implies the need to usually recognize that, the territory requires an analysis on its developmental potential is an “**in**consistent economically artificial unit”; because it does not bear the minimum dynamic autonomy to develop its own economic development. And this is because the subjects of planning – are those which require territorial economic development programs by technical consultants – that are institutions which are rarely geographically circumscribed corresponding to the region where the **economic dynamics** of the territory are submitted to analysis and defined. So as a general rule, the demand for planning comes from a public entity (governmental or not) which is supplied with material and legal sources for planning the development of a politically defined territory, such as a city, a State in the Federation, or a region whose borders have

not been defined by economic criteria.

Let's imagine that a given town or city requests diagnosis on its developmental perspectives and a strategy capable of maximizing the effective harnessing of its potentialities. This is the "focus-territory" of the analysis. But when the "**focus-territory**" is a town, it rarely becomes the "**relevant-territory**", understood here as the territory whose dynamics shall be defined by the potentialities and the **focused** challenges. So as a general rule, when the focus-territory is a town, the relevant-territory is a broader region<sup>43</sup>.

When the focus-territory is a region composed by a set of towns, the relevant-territory can be equal, larger, smaller, or simply distinct from the focus-territory<sup>44</sup>. In this case, usually the relevant-territory will be multiscaled, including the re-division of the originally proposed region, as well as the incorporation of new areas so that the region will present dynamic solidarity, but they were improperly excluded from the initial regionalization.

But for those who understand this concept well: the intention to identify the relevant-territory is a great challenge, but this does not mean the intension is the analytical starting point. In fact, it nearer to the arrival point than the starting point. The starting point is already known. And, in the beginning, we do not have any indication on the spatiality of the relevant-territory<sup>45</sup>. **Even because – contrary to the technocratic and universal regionalization systems – we are seeking exactly the specific characteristics of the territory; whatever makes it peculiar and unique; what makes it different from "others"** (those that are, despite the nearest of even adjacent, present an economic dynamics which are essentially distinct). What this implies is that we are searching for a "truly differentiated artificial unit". And we cannot seek differences, if

we freeze the analytical procedures and make them independent from the respective studied reality.

On the other hand, if it is necessary to make the analytical procedures more flexible in order to adapt them to each concrete situation. There are some standard procedures which must be presented in the natural order (or, at least, in a more natural order) as they are adopted in the distinct analyses of concrete regions. And the first procedure is to **perform systematic comparisons of the selected indicators for the focus-territory, as compared to the selected indicators for their "multiple surroundings"**.

If the focus-territory is a town/city being evaluated is within the "surroundings", we must include the following: 1) the set of neighboring towns/cities, the focus-town has granted in the recent autonomous processes (statistically comparable areas); 2) the set of neighboring towns/cities around the focus-town/city; 3) the regions in which the town/city is integrated institutionally<sup>46</sup>; 4) the set of the State (or country, in case the national economy is relatively small and/or it is not organized as a Federation) where the focus-town/city is located<sup>47</sup>. As well, in case the focus-town/city is a municipal center (it does not matter if there is a region or not) this can be useful in comparing its performance in the short, medium, or long time span to other centers based on the similar demographic and economic expressions in the State (or country)<sup>48</sup>.

Now on the contrary, if the focus-territory is already a region, it is necessary to define differences internally, considering if the evaluation is performed as an actual unit or not. In this case, a good starting point would be to identify the central towns/cities (in the simplest and most general way for gravitational models: the largest urban agglomerations) and monitor them and evaluate them based on their indicators. Another equally good way to do

this would be if there were institutional regionalizations which sub-divide the focus-region; these must be recovered, so that it is possible to evaluate what unifies and differentiates the sub-regions<sup>49</sup>. And finally, compare the dynamics of the focus-region to all the other similar regions (no matter what basis is applied for the adopted regionalization), as well as for the economy group in the State (or country) where the region is located.

### Recovering the focus-territory dynamics and its surroundings

The first indicators which must be recovered and confronted are the performance indicators, which are dynamic indicators. The importance of this starting point is based on the fact that, usually, the demand for a diagnosis and regional development program is associated to some evaluation (so as a general rule and merely intuitive) on the economic performance of the focus-territory. It is worthwhile to say: the requesting subject for a regional development policy must perform a previous diagnosis of their own performance and the challenges placed before them. The systematization of the territory performance and comparison to other territorial structures makes it possible to readback the collected results using the intuitive diagnostics from the contractors. So as a general rule, convergences and divergences emerge. And the exploration of both is very useful. It is especially useful in the identification of discussions motivated by contradictions and unexpected discoveries. Rarely, intuitive evaluation from territory managers is unfounded. But, countless times, the actual problem does not correspond exactly to the announced problem. And, this is revealed by facing the collected information.

There are several variables and indicators which supply

distinct measurements for the economic performance of a region and it is extremely valuable to recover the greatest possible number of these and confront them. On the other hand, it is also necessary to avoid the mere accumulation the data, hierarchizing the indicators based on the reliability function and precision of the information systems on which they are based. This is what caused us to propose a basic hierarchy for the dynamic indicators, beginning with the simplest and most obvious – as demographic indicators – and then going on to the more complex and results from possible wrong interpretations – as human development indexes (HDI).

The prioritizing of demographic information on specifically economic information such as the evolution comparison of Gross Value Added (GVA) from the focus-territory and its diverse surroundings and/or sub-regions – there are diverse definitions. Firstly, the demographic accounting is very simple, the oldest and the most homogeneous as compared to socioeconomic accounting. The criteria of the activity allocation in the primary, secondary, or tertiary sectors, as well as the information bases for calculating the GVAs or the GDPs (Gross Domestic Products) for towns/cities, regions, states, and nations vary as time goes on, imposing discontinuities on the statistical series which are not strictly comparable. Furthermore, the computation unit of the GVA is monetary, which imposes an extremely complex job of temporal comparison of economic values submitted to chronic inflation (and, as in Brazil, it is subjected to countless numerical changes). But if this is not enough, the **product** of a town/city is not necessarily converted into **income** for the residing agents who respectively live there. The GVA is generated by an enterprise that is established in a hinterland town including taxes (which are channeled to the federal and state government), interests and depreciations (which are channeled to mortgage and loan institutions, general

rules, overseas) and profits (which are channeled to the head offices whose headquarters may be overseas). The approximation between the local product and local income – between the GNP per capita and quality of life – is, however, usually wrong.

But the main determining factor for the demographic priority on directly economic variables is found in the fact that the **comparison of the population dynamics** of distinct territories from the same nation (it is worthwhile to say: in the hinterland of a territory without any institutional circumscription on migration) is already an objective expression from a set of subjective evaluations of the immigrants on the differential quality of life from the abandoned territories vis-à-vis to the destination in territories. The towns/cities can lose population (or whose population increases less than the average as compared to the referenced region) as they are classified by the immigrants as territories with a lower capacity of absorption and adequate earnings from their productive potential from the towns/cities where immigrants are received and gain population above the standard regional growth index<sup>50</sup>.

Let's assume the prioritization of the demographic analysis does not imply devaluation to follow up the variables which were referred to as GVA, GNP, and the declared monetary income (in the Demographic censuses), as well as the evolution of these same relativized variables (per capita or based on the area). Notwithstanding, it is necessary to be very careful when considering to not apply improper comparisons among calculated variables based on very distinct methodologies. This is a way to work around this – but without voiding it! – the problem of comparability involves seeking to evaluate the evolution of the **participation** of the focus-territory and its nearest surroundings in the GVA (and/or in the GNP; and/or in the monetary income) in the larger regions, in those respective locations where it is/they are

inserted. Chronologically ordering the information on the distinct percentage of the GVAs (agribusiness, industrial, services, etc.) in the focus-territory in regions where it is possible to calculate the taxable portion between the two variables and the meaning is the same. If the correlation between time and participation in the GNP is positive, the focus-territory (and its closest surrounding areas) present a performance better than the entire area; and if it is negative, the performance is worse; if it is void, the performance is similar.

Lastly, it is necessary to be very careful in the evolution analysis of relativized variables. **The per capita income, for example, can increase when the income increases due to a drop in population.** After all, the people who emigrate from a territory are those who consider their income unsatisfactory; the people who remain there are usually satisfied with their income, and this tends to be higher. Increasing the per capita income can be, thus, another aspect in a population loss, which is quite symptomatic and worrisome. It is worthwhile to observe that, after implementing the rural retirement pension in Brazil, the monetary per capita income increased quickly in diverse rural towns which had been losing population and whose participations in the GVA and GNP had been quickly dropping. This situation is in crisis. But it can be obscured if we consider the per capita income growth uncritically. So as a general rule, the interpretation of the relativized indicators must be interpreted associated to absolute indicators (total population, total GVA, total city domestic income). The same safeguard is valid for diverse types of human development indexes (HDI). Without being useless, the fact that the indexes result in averages (simple, pondered, harmonic or whatever) the indicators can obscure the presence of serious problems. Therefore, the indicators are not enough to be compensated by indicators where the performance of the territory is especially positive.

This performance analysis generates an initial diagnostics of the development pattern of the focus-territory when compared to diverse regionalization scales. Since this baseline, these factors are going to delineate solidarities and dynamic oppositions which will be used further ahead in determining the relevant-territory<sup>51</sup>. Besides this, the performance diagnostics make it possible to evaluate more strictly the accuracy of the “intuitive diagnostics” for the research requesting agent. Usually, in this collation, convergences and divergences are identified. And the debates which are promoted for the purpose of evaluating the determining factors for analytical divergences usually generate important clues for future research purposes.

In any case, the performance diagnostics is only the first step when searching for determination criteria in the relevant-region. The fundamental indicator, from where one shall emerge (or more) proposal of “relevant regionalization” is not a dynamic indicator, but a structural indicator. It is so important that it merits a section just for this discussion.

### **Locational Quotient, “the” regional economic indicator**

As we have seen throughout the first three chapters, in the dynamics of a territory, as well as its consistent economically regionalization must be based on its specialization and exportation profile. But, up to now, nothing has been informed on the relevant indicator for determining the impelling activities and its differentiation on activities focused on the internal market. According to North, although, such differentiation is quite simple:

“the exportation industries must be clearly distinguished from the ‘residential industries’. The term residential is used to designate an industry for the local market which develops where the consumer population reside. In order to determine the market area for each industry most precisely, it is possible to classify a priori employing the Locational Quotient [LQ], developed by Hildebrand and Mace. The Locational Quotient compares the employment concentration to a specific industry in an area (the object economy, which for our objective is the region) to another area (the reference economy, which for our proposal is the nation)” (North, 1955, p. 300/1).

As we will see further ahead, the appropriation that North stated for this category is quite malleable. It has to be: as it depends on the characteristics of the territory being analyzed, taking the nation as an economic reference is the most adequate. But in the case of such a large continental country as Brazil, then there are enormous disparities and regional differences, the economy of producing States are extremely diversified or in large national regions, so as a general rule, it is a good reference to evaluate a specific activity focused on the internal market or for exportation. In this case, the LQ is expressed in the following way:

$$1) QL = \frac{(\text{Emprego Ind A Reg E})}{(\text{Emprego Total Reg E})} \div \frac{(\text{Emprego Ind A Estado E})}{(\text{Emprego Total Estado E})}$$

Let’s imagine that industry “A” is a shoe-making industry. Then imagine that Region R is in the shoed-making industrial region of Vale do Rio dos Sinos. Then finally imagine that jobs in the shoe-making industry correspond to 40% of all the local jobs.

If this industry generates 10% of the jobs in State E (Rio Grande do Sul State), the LQ is defined as  $LQ = 4 = (40\% / 10\%)$ . Then, it can be stated that Vale do Sinos is four times more specialized than Rio Grande do Sul in the shoe-making industry.

The relationship between LQ and exportations is based on this presupposition: the consumption patterns in diverse regions are significantly homogeneous. Thus, if a region dedicates a percentage four times greater than the State set (grouping), then the production of an “x” product is around  $\frac{3}{4}$  of the production from that region and then the production must be channeled to other regions. The most specialized production corresponds, in this manner, to production for exportation. Exportation products are those in which the territory is more specialized than the macro-region in which it is inserted. But – it is worthwhile to observe – then it does not make sense that any LQ above this unit reveals an activity targeted for exportation. As North reminds us,

“Hildebrand and Mace considered some differences [regional] as demand functions, what would make some residential activities appear to be over 1.00. They came to the conclusion that 1.508 was the limit of their study” (North, 1955, p. 302, note 32.).

What exactly is the lower limit of LQ for an exportation activity and what is the upper limit of the LQ for an activity targeted for the local market, as there is no way to define the priori. But it is important to pay attention to the impact on the economic indicator which is used as a reference for comparisons. If the reference economy is the nation, more expressive distinction can emerge than in the case of local demands, and an elevated LQ can be referred to

as a domestic industry. But if the reference region is sub-national (the Central Eastern region; a Federation Unit; a macro-region in a state from the IBGE) a LQ near 1 can be an exporter LQ. It is enough for the entire reference territory to be as specialized in production and exportation as the “x” product as the region being analyzed.

North even recognizes that the Locational Quotient of Hildebrand and Mace

“it is not very appropriate for agriculture. In this case, use a specialization coefficient in which the number value is the physical volume of the production in the region in relation to the physical volume of the production of agricultural products throughout the entire nation. The denominator is the absolute value of the nation [sic]. Even if such a coefficient shows some obvious limitations and then it must be used carefully, it more adjustable to the available data of the Localization Quotient” (North, 1955, p. 302.).

The determinants of inconsistency of the LQ from Hildebrand and Mace related to agribusiness production are clear cut. Considering the seasonality that characterizes rural production, we cannot simply associate the employed workers in agribusiness as this product or those who are only involved in this exclusive activity. On the other hand, it is not clear, in the above text, how North proposes to calculate the “denominator [while] for the absolute value of the nation”. If the author used the value category in the strict economic meaning, his proposal would be to evaluate the total agribusiness production (or, at least part of it, such as temporary agriculture) as related to the Gross Product Value or the Gross Value Added. If you accept this interpretation, then the

advantages and ambiguities of the measure proposed by North are clearly understandable.

$$2) QL_N = (\text{Quantum X in the Region R} / \text{Quantum of X in the State E}) / (\text{VAB agribusiness Region R} / \text{VAB agribusiness State E})$$

The unit between the  $LQ_{H-M}$  (LQ of Hildebrand and Mace) and the  $LQ_N$  (LQ of North) are clearly understood if we convert the above equation 1, in equation 3, below, by algebraic manipulation

$$3) QL_{H-M} = \frac{(\text{Emprego Ind A Reg R})}{(\text{Emprego Ind A Estado E})} \div \frac{(\text{Emprego Total Reg R})}{(\text{Emprego Total Estado E})}$$

Let's suppose that Region R provides 4% of the employment in the shoe-making industry in Stage E. Then, suppose that this region provides 1% of the total employment in State E. In this case, the  $LQ_{H-M}$  of the shoe-making industry in Region R would be 4; indicating that the region is four times more specialized in shoe-making than the reference State. This is the idea that North wished to recover in his distinct LQ: suppose that the agribusiness products have their final prices and costs similar in diverse regions in the national territory (strong hypothesis), if the participation of a region R in the physical production of soybeans is 4%, but the participation of this same territory in the agribusiness GVA in general is 1%, North attributed a  $LQ^{52}$  of 4 for the specialization soybean crop region R.

Now, if the specific value of the indicator is based on a projective function, if it is conducted on some type of economic hierarchization of its impelling activities, a measurement calculated in this terms, would not be very strict and with well-

defined control, then it would not be very dependable. But, this is not what it is about. What we wish to do is observe and catalog the discrepancies. It is necessary to pay attention to a LQ above a unit. If it is greater than 2, the activity would not be just for the internal market. If it is much greater than 2, then this activity displays special expertise in the territory, and the activity deserves to be investigated in greater detail, as this is no doubt that it articulates to a supply chain focused on exportation. This is everything that is important for extracting the LQ. What does this mean, when we say it is possible to tolerate a certain margin of fluctuation and sub-define the category without any fear on the quality of the inferences extracted based on its monitoring. Even so – from the beginning to the end – if the LQs were biased upwards due to peculiarities in the consumption pattern for a specific region, or were biased downward because the referenced territory is too small and significantly specialized in a few products for exportation, this information has emerged throughout the research. The LQ is only a sign. But what a sign!

The LQ speaks about specialization and, therefore, the outgoing production, pointing to the impelling activities. But – in the Anglo-Saxon tradition of Smith, Marshall, and North – this specialization also speaks about expertise, learning by doing, innovation and competitiveness. The LQ is a measurement that shows “signs” on each one of these key-variables that – as we seek to demonstrate in the new conclusions in each chapter – they are profoundly intertwined in the case of regional dynamics. Before going on from this point, however, it is necessary to strictly define and differentiate the “economic activity”, “economic sector”, and “productive supply chain” categories. This is the objective of the next section.

## Activities, Sectors, and Supply Chains

Just as families and “relevant-territories”, economic activities are “real artificial units”. This means that they are **human creations** which are based on **materials and histories**. The fact that it is a classification system already reveals its human artifice nature. Its basic materials are specific technical characteristics are distinct production processes. And as productive processes change as time goes on, the classification system changes as well<sup>53</sup>.

Simultaneously, the growing integration with the global markets imposes a growing approximation of the national classification systems. After the coming of the United Nations System (which involves, besides just the UN, the International Monetary Fund, the World Bank, the Global Trade Organization, among other international standardizing institutions), was created the ISIC - International Standard Industrial Classification of All Economic Activities -, which sets guidelines for all productive national classification systems. But the ISIC undergoes adaptations in each country, due to each country’s edaphoclimatic peculiarities and/or concrete social-productive structure<sup>54</sup>. In Brazil, the classification system adopted the Classification of National Economic Activities (CNAE), which is updated recurrently due to the productive transformations in the country and the new standardization rulings from the UN. The present CNAE (2.0) has 21 sections, 87 divisions, 285 groups, and 673 classes<sup>55</sup>.

This classification system is used by all statistical data producer entities (IBGE, IPEA, etc.), regarding national, state, and municipal economic and taxation collection inspection activity standardization guidelines<sup>56</sup>.

When we refer to **economic activities**, usually we refer to

the maximum level of opening (availability) in the national or international classification system. In contrary to the activities themselves, the categories are **aggregated** (sections and divisions, in the case of the CNAE) they correspond to what we call **activity sectors**.

What is necessary to understand is the integration of distinct **activities** is defined in **sectors** (it is worthwhile to say: that the activity **clustering sectorial** system) is not the only existing alternative. It is the dominant system only because it is the easiest system and most dependable for classifying activities; as the **sectorial system groups activities based on the similarity of technical-productive processes and, secondarily, it is based on the similarity of the final product**.

The maximum aggregation of a sectorial classification system is the famous triad “agribusiness, industry, and services”. In this case, it is evident, that on the one hand, the plurality of grouped activities and on the other hand, the prevalence of productive-technical criterion in the clustering. After all, there is not just “the” agribusiness product. Papaya, milk, coffee, live fowls, and beef livestock are some of the countless agribusiness products. What imposes the question: What is the foundation for this aggregation? And the answer is similar to the production technical standards in contrary to the industrial production and services. More precisely, the agribusiness activities are distinguishable from urban activities by the level of human control (artificiality) of the productive surroundings<sup>57</sup>.

These are urban industries and services that cluster artificiality to their methods. But they are also distinguishable in another technical dimension which is directly reflected in the quality of their products. To begin with, **agribusiness as an industry**

**produces “goods” which can be stocked and transported. We can say that agribusiness is an industry which produces tradeable goods<sup>58</sup>.** And the main ramifications of this unit are: 1) industrial production does not depend on any previous demand for its performance, as it can be produced for the purpose of stocking the product; and 2) industrial production does not return to supply local demands, it can be (and usually is) exported to other regions. Otherwise, **services (such as dental treatment, massages, or bank credit) presuppose the manifestation of a demand (they are only produced after the demand) and they return, preferentially, to serve the domestic agents in the supplier’s territory<sup>59</sup>.**

In short: the sectorial classification serves scientific criteria, as it is an exhaustive classification (which involves all activities), mutually exclusive (despite the limbos, the borders among sectors) and it is based on the principles of similarity of productive techniques. **But the sectorial classification is not the only possible or available scientific standard. Neither is the classifying standard the most adequate for the classification of “impelling” or “multiplicative” activities.**

An alternative to the sectorial standard of classification is **the integration of distinct activities based on their connections to the market, along the production supply chains.** There is even an alternative nomenclature for the sectorial triad referred to above that seeks to recover its productive chain links from: the “first”, “secondary and “tertiary” sectors. This nomenclature explains the **relationships** between the customer-supplier among the three large-scale sectors. Thus, the agribusiness (and the mining industry) supply the raw materials to industry (for transformation and construction), which then supplies the inputs/industrial production for transport (in the case of the transformation industry), commerce, and other services focused on serving final customers: the consumer

families and the transformer and inverter companies.

Now, this is how to sectorial-technical classification works and is broken down into sections, divisions, groups, classes, and sub-classes, the relational classification also is broken down into **productive chains.**

It is worthwhile to note the distinction between the supply chain and the sector as it is far from being obvious, as much as it **is possible (and frequent) the transition from one perspective to another without any change in the nomenclature of the considered economic activities is performed.** And this is, exactly, what Leontief does in his famous Input-Output Model (IOM), whose lines present the production (and the destination of the production) sectorial, while the columns (which recover the same taxonomy, the same nomenclature of the sectorial classes of the lines) recover the inputs utilized for each segment until the final production is concluded<sup>60</sup>. Let’s show an example: the first lines and columns of a typical IOM refer to the first classification of production (agribusiness). On the line, we can see the value of the production from this sector, divided by its **destinations**. Thus, a part of the production (seeds, for example) are targeted back to the respective agribusiness; the other part is targeted to the food processing industry (livestock, cereals, etc.); another part goes to the textile and wearing apparel processing sector (cotton, linen, etc.); another part goes to furniture production (wood); another, paper manufacturing (wood); and so forth. If we consider the first column, the final value (the last line) it is the same as the final value (in the last column) of the “sector”, which corresponds to the value of the production. But each cell in the first column presents completely distinct values, informing on how much the agribusiness “**input**” (was purchased and used for the production) from all the other sectors, including what was purchased from the respective agribusiness (seeds), from the

chemical sector (fertilizers), from the petrochemical (fuels), from the transport material sector, and automotive vehicles (tractors, harvesters, etc), and so forth. Thus, it is possible to consider a segment or activity based on what it “consumes” to produce what it produces to make it part of this segment in the **productive supply chain**; while we take a segment and productive activity based on what it produces (and the targeted destinations for its production) and define it strictly as a **sector**.

Despite the subtleness of this distinction, there is a true abyss separating these two perspectives. This example can help to explain this point of view we use to clarify. Imagine, there is a community/territory whose production is centered on the shoe-making industry and it produces virtually all the necessary inputs for that industry<sup>61</sup>. **If we consider the production structure of the territory of a sectorial perspective, we can notice that the production is extremely diversified.** After all, despite the elevated participation in employment and added value to the shoe-making sector, the territory also displays a not insignificant participation companies and workers in the following sectors: 1) **wood-furniture** (where the wooden soles for footwear are produced); 2) **rubber and plastic** (where soles, adhesives, and parts of shoes are produced); 3) **chemical** (focused on glue production on footwear); 4) **metallurgy** (produces “core” accessories for feminine footwear, buckles, and snaps); 5) **mechanical** (machinery for the shoe-making industry); 6) **paper and cardboard** (packaging for footwear); 7) **service providing to companies** (footwear design, accounting, and consultancy for shoe-making companies, machine maintenance for manufacturing footwear); 8) **transport** (footwear).

More: if we accept the Keynesian classification of consumption as an income induced variable, it is possible to include in this supply chain system: 1) **education** (for the children of shoe-

making industry workers); 2) **health services** (for the families of the shoe-making industry workers); 3) **food industry** (bakeries and canteens for food services to shoe-making workers and their families); 4) **urban transportation** (for shoe-making workers, other workers in the supply chain and their families); 5) **distribution** (and, eventually, production) power supply (for the companies from the shoe-making supply chain for the consumption of the shoe-making workers in the supply chain and their families), etc.

**It is not necessary to clarify that, when we look at this perspective economy of the productive supply chain, which shows a high level of diversification which becomes an “industrial monoculture” system. The truth is that the economy is impelled by some supply chains. If these are going through a crisis, then the entire regional economy becomes impacted.**

Here, as you have noted previously, the consecrated classification standard for activities in Brazil (and in the world) is the sectorial standard. Thus, based on the information from the national statistical system, it is possible to know how many companies in the chemical **sector** are present and operating in a given territory. But usually the productive supply chain(s) is/are **not** inserted. And as all and any of the productive supply **chains** are structured based on the distinct chains sectors, **the sectorial classification tends to underestimate the productive specialization of the regions, as well as the dependency on the specific global economic dynamics of the central links of the regionally consolidated supply chains.**

Now, as we saw in the second chapter, inside the Smith-North system, **the starting point** for the mercantile development of an outlying territory is to identify a **product** (or in a more general way, an activity) in which the territory displays enough

absolute advantages to specialize and export to more developed regions. So as a general rule, this is a (primary) agribusiness product or mineral ore. But the mercantile connection is not a guarantee for the continuity of development. This continuity depends on integration in the territory to upstream links (input suppliers) and to downstream (processors and wholesalers) of the initial specialization of the product-activity. In such a way as it is necessary to overcome the classification sectorial standard and convert it into a supply chain system. This is the necessary condition so that it is possible to evaluate the potential leveraging of the current specializations for future development in the territory.

As we will see further ahead, the sectorial conversion system of classification in a supply chain system supplies, simultaneously, the bases for determining the relevant-territory.

### **Identifying Impelling Activities/Chains focused on determining the Relevant-Territory**

The first step in identifying supply chains is to segment the activities into “impellers” (it is worthwhile to say: exportation) and “multipliers” (it is worthwhile to say, focused on the internal market). For this purpose, we shall use the LQ, comparing the percentage of workers (or in the case of agribusiness products, the volume of production) for each activity in the focus-territory, on the percentage of workers (or production volume) for the same activity in the reference territory (so as a general rule, in the case of Brazil, the Federation Units). The larger the LQ rating is, the greater the safety margin is that the goods and services produced in this activity will end up being exported.

In order to calculate the LQs, it is necessary to observe

which macro-sectors are the highest. If an expressive portion of one of them is in the services sector, then this is a clear indication that this is a municipal center. And this is because the universal function of the centers is to supply relatively sophisticated services in the health sector (effectively equipped hospitals), education (university and technical teaching), business (diversified business centers), and consultancy (accounting, legal, and general technical support), and culture, leisure, and tourism (music, theater, movies, gastronomy, etc.) to a large population who are residents there.

As soon as the center characteristic is identified, it is necessary to identify if it will be a strictly regional center – it is worthwhile to say: to serve the demands of the residents of the surrounding towns/cities – or if it is a center without a region – in case of high service supply LQs and if it must supply the demands of the residents in regions which are further away, or it is a focus-territory for tourists to supply leisure or business. Once again, this distinction will employ the analysis of the LQs as a method. In cases of **centers without regions**, the eventual service LQs (hotels, car rentals, prostitution<sup>62</sup>, etc.) tend to be more impressive than the permanent services (education, university, automotive vehicle resale, business consultancies, etc.), which are characteristic of especially regional centers.

When considering a center without a region, it is necessary to evaluate what are the contents of its “tourism” attraction. Generally, so as a general rule, it is very easy to constitute a hypothesis based on existing touristic facilities. It is quite evident, what the main tourist attraction in Santos, Paranaguá, or Rio Grande, as they are their harbors<sup>63</sup>. A hypothesis can be confirmed (or not) by analyzing more accurately the activities of a higher LQ rating. In order for it to be legitimate, such as the sales of fuels, motor vehicle maintenance, tire repair shops, etc., it must

be necessary to present especially the higher LQs ratings *vis-à-vis* o than the LQ on hotels. There may be particular difference, in a typical leisure tourist center, such as hotels, restaurants, cultural activities, and a lower LQ in activities connected to supplying services for cargo transport.

If it considers a typical regional center, the basic government facilities, such as: education and health – and the commerce of durable goods, then they must present higher LQs ratings in the hotel and other services provided to transient customers. In this case, it is necessary to identify the region that has a higher demand for service centers. This is because this **is the primary determination for a regional center relevant-territory**<sup>64</sup>.

The definition (even preliminary) of the relevant-territory made it possible to define the activities and impelling supply chains for the regional economy. These are the major LQ activities of the relevant (pre)region. It is necessary to pay special attention to the agribusiness productive and mining activities in towns/cities in the surrounding regions which displayed more impressive LQs. It more probable that the main urban center of the territory will also be the main benefactor and/or provide inputs and technical support to the impelling activities in the outlying regions as North had already expressed.

Now, the economic dynamics of the regional-center is based on the following items: 1) on the income and consumption capacity of the surrounding regions which have selected the center as the main service provider; 2) add value to the center, from the processing of raw materials from the surrounding regions, and from the production and sale of industrial inputs and technical support to the surrounding regions. The final definition of the relevant-territory will depend on the relevance/impact on

generating employment and income from the activities linked to these two functions of the center: 1) provide consumption services to the residents of the surrounding regions; 2) process materials and provide support to the production of the surrounding regions. So as a general rule, the more important the first dimension is the less influence the center will exert; the more important the second function is, the broader this area will be. And this is because the propensity of the consumers to travel, which is usually, less propensity of the raw materials to seek processing<sup>65</sup>. Anyway, the actual relevant-territory must be in a smaller area (focused on serving flexible demands) and the larger area (productive interaction).

After the relevant territory is defined (or, at least, nearly defined) it is possible to detect activities and/or impelling supply chains in the territory. These will be exportation activities (higher LQ rating) then considering the entire relevant-territory (including the center and the polarized towns/cities)<sup>66</sup>.

Finally, we need to evaluate the definitions for the relevant territory in the center of those towns/cities, which have not been defined so strictly as **regional centers**, and not even as a **center without a region**. This is a typical case of towns/cities which have been selected politically and strategically to lodge a set of **government facilities** for the purpose of providing health, education, and security services in a diffused region, composed of more than one economic region. Many times, such towns/cities do not achieve the development and implement an industrial processing system, neither a consulting service system, sales, and/or technical support to diversified productive systems in the surrounding regions.

This is exactly the case of the city of Santa Maria, in Rio

Grande do Sul State. Since the end of the XIX century, it has been identified as a strategic center for national security. It is located a short distance, but not negligible from the borders of Brazil, Argentina, and Uruguay. It was selected to house a significant amount of military and logistic equipment, making it the central junction of the railroad system in the extreme southern part of the country. Afterwards, this town started to concentrate and implement a government service complex equipped effectively to serve health and education, which defined the broadening of its scope of regional influence as a **universal service provider**.

The first one to observe such a town that debunks one of the hypotheses of the simplified North model in the definition of income presented in the second chapter: the principle that the budget must be balanced and the governmental expenses should be equivalent to the governmental expenses. The ninth equation in the algebraic system developed in that chapter confirms that the available income ( $Y_d$ ) in the economy of a surrounding region which does not produce capital goods, neither consumption goods, corresponds to the total consumption of the workers ( $C_w$ ), the value of the exportations ( $X$ ) and the governmental deficit ( $G-T$ ), as to:

$$1) Y_d = C_w + X + (G-T) = wY_d + X + (G-T)$$

And, in the case of the budget it is balanced if ( $G = T$ ), then

$$2) Y_d = X (1 - w)$$

Now, if the governmental expenses are greater than the

collected taxation ( $G > T$ ), then

$$3) Y_d = (X + G - T) / (1 - w)$$

Now, towns/cities like Santa Maria<sup>67</sup> are earmarked, exactly, to be granted a quantity of governmental resources (especially from the federal government) way over the local taxation collection. The earnings of the military and the salary of the university professors and the other government workers are a very important part of the “basic income” (as defined in North’s concept) in the region. These sources of income play the same role as the exportations do in the “basic income” of the typical outlying region economies in the simplified North model.

But the total income of the economy in Santa Maria is not circumscribed by the value of the government deficit multiplied by the inverse participation of the profits in the income ( $1/(1-w)$ ). It also will depend on the income coming associated to the service providing to the region. Thus, a student at the Santa Maria Federal University whose family resides in a surrounding town is able to benefit from the free education, pay for expenses in the respective town, promote hotel activities, civil construction, restaurants, general commerce, etc. And these expenses will increase based on the generated amount, and the revenue appropriation (of the families) of the users who use the Santa Maria Services. Therefore, the dynamics of such a city will depend fundamentally on: 1) the evolution of the governmental deficit in the territory; 2) **the dynamics of the primary income (it is worthwhile to say: the growth of the exportation value) in the surrounding towns/cities that use the services in Santa Maria**. In short: a part of the dynamics is exogenous and unrelated to the territory (depending on the politics of the federal government), and

the other part is referred to in a broad surrounding territory, so as a general rule, it involves several diverse economic regions, with distinct specializations, and potential distinct dynamics. And this diversity has to be learned when possible. In order to project the probable dynamics of such a “diffused center”, it is necessary to project the dynamics of the government expenses to the town/city and the dynamics of diverse economic regions (relevant-territories) in order to serve as an economic base<sup>68</sup>.

In the case of the focus-territory, it has to be a polarized town/city, its LQs need to be more impressive if they are based on the agribusiness production and, maybe, in basic processing industries for this production. In contrary to, the LQs of the urban services which may be commercial, whether they are hotels and tourism, whether they are basic education and health public services, they must be near the unit or lower to the unit.

The identification of the relevant-territory, in this case, follows an inverse path from the identification of the relevant-territory in a regional center. The first thing to do is to identify the urban center that supplies more sophisticated services to households in the satellite town. The next step is to define the set of towns/cities that are clustered in the same productive function – it is worthwhile to say: the same agribusiness specialization(s) and/or agri-industries – and articulate at the same center. Finally, it is necessary to project the dynamics of this system, for the purpose of defining “opportunity windows” which will open when faced with the development process in the supply chain and the chances of a town/city taking advantage of these opportunities to enlarge/diversify the economy and gain greater autonomy and growth potential. So as a general rule, a strategy for increased autonomy (always and necessarily relative) takes place by enlarging the internal added value (processing) and **by enlarging the internal**

**income multiplier** (associated to the relative depression from the channeling of income from the consumers to the municipal center)<sup>69</sup>.

Finally, regarding the focus-territory that is already a region, the identification of its consistency or not as a relevant-territory begins by identifying the main “primary” productive specializations (involving agribusiness and a set of mining activities) in each town/city and the region in general. This first surveyed data will already start to display the unit or internal diversity: the more diversity the higher LQ products are in diverse towns/cities and the more the town/city specialization of the entire region is; and the greater the probability that we are dealing with a badly specified region in economic terms, and greater will be the probability that it will encompass to a more relevant territory. The next step is to identify the municipal centers (to generalize the high concentrated urban centers) and analyze their higher LQs, with an initial emphasis on industrial LQs. **The similarity of specializations reinforces the hypothesis that the region is an economically consistent territory; divergence reinforces the hypothesis of the clustering of relevant multiple territories in a badly economically specified region.** This collation among the urban specializations of centers and the rural specializations of surrounding towns/cities of each center is the acid test. If we note that there is increased diversity in the basic production (in rural towns/cities) and the processing and support (in the municipal centers), the formal region is not effectively united, but it is composed of diverse relevant-territories. The detailed specification for each relevant territory of a badly specified region will be based on the mechanisms which have already been detailed above on the determination of relevant-territories of municipal centers and the surrounding areas: the analysis of rural productive homogeneity, analysis of the connections of roads and highways, interviews

with service suppliers in general, and processing in centers (for the purpose of identifying the geographic polarization spectrum, analysis of “Datusus” information systems on public services, school registrations, etc.).

Finally, it is important to understand that the predefined region is approved in the homogeneity test and characterized as a single “relevant-territory” as the work of the final specification is still not concluded. This test confirms that the region is a single unit. But this does not mean anything about its “sufficiency”. And this is because the relevant-territory **can be bigger** than the region (polarized homogeneously) analyzed; **it is possible that bordering towns/cities to the region have been improperly excised from the territory at the time of its specification**. The evaluation of this hypothesis goes through the “onion strategy” recovery: the **gradual** incorporation of the neighboring towns/cities to the region for evaluation: 1) for its productive specializations; 2) its connections to the region center(s) (compared to alternative centers, situated outside the focus-region).

If homogeneities and expressive connections and it is necessary to evaluate to see if they exceed the connections which have been considered (even in an intuitive and unsystematic manner) on the dominant regional division; related to that which defined the borders in the towns/cities to another region. The first step is to identify what the **dominant** service center is for the town/city being (re)evaluated. If, in spite of the above identified connections, evidenced by the much more intense connections and diversified to the respective town/city where the regional center is be currently inserted, we recommend keeping the traditional regional division. If this first criterion is shown to be insufficient (ambiguous) then it is necessary to analyze in greater detail **the entire productive structure of the town/city being (re)evaluated**,

for the purpose of revealing the intensity of its connections to the two regions. This analysis can be a lot of hard work; especially if we operate in regions which are relatively large and made up of a large number of towns and cities. Fortunately, there are software programs for territorial clustering based on homogeneity to greatly simplify this task. Such software programs test, **based on a set of criteria defined by the researcher**, what the most consistent region is based on productive specialization, agrarian structure, and edaphoclimatic characteristics in the bordering towns/cities in the two regions.

In the case of Brazil, the open source “TerraView” software program prepared by INPE (Spatial National Research Institute) is compatible with a aggregation program of areas based on homogeneity (the Skater) is an excellent support tool for facing ambivalent situations as described above<sup>70</sup>. Notwithstanding, it is necessary to remember that the program defines the most consistent regionalization **based on the variables selected by the researcher**. Which means that what I wish to say is, aggregation is a specified area for region A or B and it is defined by the researcher based on his/her own analytic criteria.

## Chapter 5

**Classification of Activities based on Dynamic Function  
and Strategic Planning of Regional Development****Introduction: Sector, Supply Chain, and Dynamic Function**

In the last chapter, we introduced two main economic classification systems for activities, the sectorial system and the system based on supply chains. But, in spite of not being a systematization object yet, since the second chapter, we have been introducing a third system of classification, based on “dynamic functions” in productive activities. Up to now, we have presented the two elementary dynamic functions: impelling and multiplicative multiplication. Now, it is fitting to analyze in detail this system and present and differentiate the impelling and multiplication patterns.

As we have previously observed, the sectorial system aggregates or adds activities based on technical-productive affinity. The linked system adds activities based on relationships to suppliers and customers. The sectorial classification system is much simpler and needs the linked system. After all, a company operating in a given sector, for example: - metallurgical – can

supply inputs and equipment for the other distinct supply chains – civil construction (long steel products, metallic frames, etc.) the leather-footwear chain (buckles, snaps, and other accessories for feminine shoes, etc.) going on to the automotive chains, naval, and food industries (all of these sectors utilize sheet metal as inputs), among many others.

On the other hand, despite the inherent ambiguities to classify based on classification chains, this classification system is much more relevant for economic analysis. First of all, because it reveals the actual specialization (behind the apparent diversity) in territories, allowing the identification of responsible activities for generation (and afterwards multiplication) of basic income. Secondly this is because it allows for hierarchization of these chains related to its impelling force in generating employment and income **in all the links** established in the territory, as opposed to the generation of employment and income in only the most evident central link<sup>71</sup>. Thirdly, because the government politics of coping with obstacles – or bottlenecks – **the regional growth tends to be much more effective when focused on chains of activities which are not yet linked**. This last point is extremely important and we will dedicate the entire sixth chapter on an exhaustive treatment of this respective subject. But, we cannot do this adequately before detailing the third system, which is activity classification: based on the dynamic function, which is the main purpose of this chapter.

In the second chapter, we imposed some rather restrictive hypotheses to arrive at the conclusion that the available regional income was an exclusive function on the value of exportations – an impelling function – and the participation of the workers in the regional income – responsible for defining the size of the local market for the multiplicative activities. Then continuing along in the subsequent chapters, we have been making the more restrictive

hypotheses gradually more flexible, but without any effort on systematization. The time has come to systematize the previously stated scores.

### **Two private impelling patterns: making the center-outlying region relationship more complex**

As we have mentioned in the previous chapter, one of the main purposes of the urban centers – whether they are regional centers, diffused centers, or centers without regions – the supply of services is relatively complex to a population who are not residents there. This channeling of income (generated and appropriated to another territory) inside one of the centers is one of its main sources of “basic income”. But, despite its impelling nature, they cannot be classified as “exportation activities”. In this case, instead of producing a tradable product and selling it to another market, the service requesting agent who travels to the center to benefit from that specific productive system. This difference is subtle, but profoundly relevant. Right away, it displays an unapparent measurement related to the centers (especially in centers **with a region**, even it diffused) to its outlying regions: the dependency on the former is related to the latter. Normally, it is possible to observe the dependency of the outlying areas on the centers. But the centers also are dependent (and, in a certain way, even more intensely!) on their outlying regions, as the basic income of the former (demand for their services) comes from the basic income of the latter, derived from exporting goods. **The growth of the centers is based on the increased demand for specific services; and this demand can only grow when the basic income (derived from exportations) in its outlying areas.**

In order to stress this difference, we have identified the two

main patterns of basic income generating activities, which shall be denominated as “impelling Xs” and “impelling TrS”. As we have already seen, X is the conventional symbol for Exportation. So, it is related to activities focused on **exportable goods** – it is worthwhile to say, tradable goods/products, transportable goods, goods generated in the agribusiness sector, and diverse industrial sectors (except for civil construction and sewage) – and whose LQ is superior to the unit, so these are classified as “Impelling Xs”.

Those are different from activities which are mobilized through the transfer of service users, classified as “Impelling TrS”. The symbol “TrS” seeks to recover the fact that this income comes from private **TransfeRenceS** associated to the purchase of **ServiCES in the TerRitory by TouRists** (it is worthwhile to say, not by the respective residents).

Just as in the case of exportations (X) they play a positive role in the regional commercial balance (as opposed to importations, which correspond to a negative role in this balance), service transfers (TrS) which play an impelling part for **inputs** to overseas, it is worthwhile to say, the positive part of the regional service balance<sup>72</sup>. This part corresponds to the appropriate income from productive agents in the territory who supply the demands of the non-resident agents (in transit) or who are transitorily residing in the territory, but **whose income is measured from outside**.

We wish to provide a simple manner to identify and classify the type of activity and income which we refer to and associate to “**general tourism**”, whereas we include: 1) **leisure** tourism, associated to vacation trips, summer vacations, visiting new places, etc.; 2) **shopping and service** tourism, in which the main stimulus is traveling and to access diversified commercial centers, health care systems, educational centers, legal services, technical

support, etc.; 3) **business** tourism, focused on purchasing inputs and/or equipment, participation in tradeshows or trade fairs, market prospection, utilization of specific equipment in the territory (such as harbors, customs, etc.); and finally, 4) **permanent** tourism, represented by retirees or rentiers who choose to reside in a distinct territory from where they had worked and/or provides them income presently by assessing the fact that the new place of residence provides a better quality of life<sup>73</sup>.

Despite the evident distinctions among these types of tourism, all display great synergy<sup>74</sup>, and all cluster the same characteristic which are expelling activities: – worthwhile to say, generators of primary income, basic income – depending on the customer’s transportation, as opposed to product transportation. But – and this is a main point – they are “reflective impelling” activities, as their effectiveness is a source of income and employment which depend on purchasing power (capacity for spending) of non-residents who travel. And this purchasing power, generally, depends on the generated income from the “Impelling X” activities from the outlying regions. A decadent outlying region is a place incapable of promoting sustainability and growth to “Impelling TrS” activities from centers. We will return to this subject in the last section of this chapter, focused on the extraction of the ramifications of the dynamic function model for the planning of regional development.

### The impelling capacity of government expenses

As we have seen in the previous chapter, those territories which host a vast set of services and government services are granted a volume of governmental resources (especially in the form of government worker salaries) significantly greater than

the respective excise tax. In these cases, the government expenses “G” is greater than the collected tax money “T” (therefore:  $G - T > 0$ ), and the extra resources transferred by the government as compared to the collected taxes is a primary income (or basic) so that the derived incomes from the tradable exportations (impelling Xs) and the derived revenues from private voluntary transfers associated to diverse forms of tourism incomes (Impelling TrS).

There are, although, different foundations in the impelling capacity of governmental expenses as related to others. Firstly, because the impelling potential from this spending is not only associated to its upstream direction, but, also equally to the respective financing pattern. Here, the government spending thereof are found to be controlled by local agents (city halls and regional administrations) which administrate this balance<sup>75</sup>. The mismatches between the tax collection and expenses **in any given territory** are associated to, as a general rule, to the upper levels of government (State or National). And these levels of government are politically pressured to alternate the benefitted territories for expenses significantly greater than the local tax collection. Therefore, the **government deficits from the upper levels of government in some regions**, even when structural: 1) are not locally controlled (endogenous); and 2) **tend to increase** (due to competition and political pressures from other regions on the national and state governments) **a lower rate than the product growth rate and national tax collection from the state and central governments**. What this implies is to recognize the long term impelling capacity of activities supported by government deficits is less than the impelling capacity from exportations and the supply of distinct and complex “tourist” services. Even if there is no complete regional autonomy, the quality and competitiveness of goods and services associated to the “Impelling Xs” activities and the “Impelling TrS” activities are under endogenous control

(local); while the government deficits from the higher government powers with the region are not.

On the other hand, it is necessary to recognize how we underestimate the impelling capacity of the governmental expenditures in chapter two and the above passage on how the governmental expenditures are only impelling in the case of deficit (when  $G > T$ ). But this statement is not strictly true. As Haavelmo demonstrated in (1945), even in a balanced budget ( $G=T$ ) the government expenditures can be impelling<sup>76</sup>. But the impelling effect will be less than other autonomous expenses. So to facilitate your understanding on this specific important point for the non-economist reader, let’s appeal to graphic representation of the relationship among the product, incomes, and expenses as developed by Kalecki based on the II Book *The Capital* by Marx (Kalecki, [1968] 1977).

Let’s say an outlying regional economy is organized as defined in the model shown in chapter two, but it operates in complete informality; let’s say, there is no government (G), neither do they pay taxes (T). In this case,

$$1) Y_d = C_w + C_k + I + X - M = P + W^{77}$$

$$2) M = C_k + I$$

$$3) Y_d = C_w + X$$

$$4) C_w = W = w Y_d$$

$$5) Y_d = w Y_d + X$$

$$6) Y_d (1 - w) = X$$

$$7) Y_d = X / (1 - w)$$

Let’s suppose that the percentage of salaries in the income

is 50%. In this case, this income is represented in the economy as related to the Marx-Kalecki departments would be as follows

**Productive Departments of an Outlying Regional Economy without a Government**

DX	DCw
Px = 50	Pcw = 50
Wx = 50	Wcw = 50
VAB = 100	VAB = 100

DX is the department that produces the goods for exportation; Px and Wx are, respectively, the profits and salary earned by this department; DCw is the producer department of the real wages/salaries; Pcw and Wcw are, respectively, the profits and the salary earned by this department. It is worthwhile to note that the production of DCw corresponds to the total demand of the real wages/salaries; and the latter is divided into two parts: the part that comes from the workers of the DCw itself and the part that comes from the workers employed in DX. Therefore the profits of the producer department of the real wages/salaries corresponds exactly to the wages/salaries of the exportation department, so that:

8)  $Wx = Pcw$

Let's imagine now, that the government is instituted and begins to charge a tax of 20% on all and any revenues. Also

imagine that the government spends only what it collects, without incurring any deficit or surplus at any time. Finally, imagine they spend all its income on contracting government workers who earn a salary similar to the salary in private enterprise and they display the same consumption pattern. In this case, the total net salaries after taxes in the economy is ( $W_{LT}$ ) channeled to the purchase of consumer goods of the workers (Cw) that corresponds to the sum of the net salaries after taxes in the private sector ( $W_{PL}$ ) together with the total salaries of the government workers ( $W_G$ )<sup>78</sup>. And as the consumption of the workers is provided locally, the product of the DCw is equal to the total net salary

9)  $Wt = W_{PL} + W_G = Cw = DCw$

The emergence of the government corresponds to the emergence of a third department in the Marxist-Kaleckian system. Let's call it the DG (governmental department). The Gross Value Added from the government corresponds to the salaries paid to the government workers who provide security, education, health and other services. As we have introduced the hypothesis stating that all the tax collection is converted into salaries, the GVA of the government, which is 40 M.U. (Monetary Unit) that corresponds to 20% of the salaries and profits from the private sector. Therefore the income structure changed and we are obliged to differentiate between the profits and net salary (PI and WI, respectively) in the total profits and salaries in the private sector.

**Productive Departments of an Outlying Regional Economy  
with a Recent Instituted Government**

DX		DCw	
T <sub>px</sub> = 10		T <sub>pcw</sub> = 10	
P <sub>x1</sub> = 40		P <sub>cw1</sub> = 40	T <sub>p</sub> = 20 = W <sub>gp</sub>
T <sub>wx</sub> = 10		T <sub>wcw</sub> = 10	T <sub>w</sub> = 20 = W <sub>gw</sub>
W <sub>x1</sub> = 40		W <sub>cw1</sub> = 40	
VAB = 100		VAB = 100	

The value of the DX product does not undergo any alteration from the institution of the government (it is worthwhile to say: from taxes), as the demand is external. Let's consider it to be predefined and stable. But the demand for the production from the Producer Department of real wages/salaries changed. Now, the net salary of the exporter department workers (W<sub>x1</sub>) only the acquisition of 40M.U. of DCw. Likewise, the salaried workers in the producer department of the real wages/salaries, can only acquire 40 M.U. of the production from the DCw. But, the government workers more than compensate this limitation. They earn 40 M.U. as their total salary (W<sub>g</sub>). The 20 M.U. which is a result from taxation collected from the DX workers and DCw are converted into W<sub>gw</sub> (salaries of government workers paid from taxes from workers in private enterprises). From this, the original demand is recomposed derived from the DCw, equating the supply and demand at 100 M.U.

But the government earns 40 M.U., as not only the workers are taxed but the capitalists as well. And as the collected taxes are converted into salaries paid to the government workers, who completely return this to the local consumption, **the demand from the government and private workers in DCw extrapolates the GAV from this department.** In algebraic terms (according to the

equation nine above):

$$10) W_t = W_{PL} + W_G = 80 + 40 = C_w = 120 > DC_w = 100$$

Let's suppose the existence of idle capacity and unemployed workers, the increased demand will be converted into increased production. This will in turn increase profits and salaries in the producer department of real wages/salaries (DCw) and consequently, enlarge the collection of taxes and employment in the government sector, which will have repercussions, once again in the DCw. What value will the system converge to?

So, as an answer to the above question, it is necessary to show the system explicating the change that will be imposed in the distribution of income among all the salaries (including government workers) and profits. We know that the available income is the sum of the profits and salaries from the private sector, after paying taxes, plus the salaries from the government workers. And the latter corresponds to the government tax collection which is a percentage of "t" from the Y<sub>d</sub> income; in this case, it is 20% of the total income. As shown below,

$$11) Y_d = P_L + W_{PL} + W_G$$

$$12) W_G = 0,2 Y_d = t Y_d$$

$$13) Y_d - t Y_d = P_L + W_{PL}$$

$$14) P_L + W_{PL} = 0,8 Y_d$$

As the distribution of income **in the private sector** did not change, the profits and salaries in the private sector is equivalent

(50 / 50), as shown below:

15)  $P_L = W_{PL} = 0,4 Yd$

16)  $W_{PL} + W_G = 0,6 Yd = Cw$

17)  $Yd = X + Cw = X + 0,6 Yd$

18)  $Yd = X / (1 - 0,6)$

In other words: even when the income distribution among the private agents continues the same, the emergence of government workers changes the income distribution among all the salaried workers (government and private) and the profits. And the result is the multiplier increases, as it changes from “2” to “2,5”<sup>79</sup>.

**Productive Departments of an Outlying Regional Economy  
with Balanced Supply and Demand**

DX	DCw	DG
$T_{px} = 10$	$T_{pcw} = 10 + 5$	$T_p = 20 + 5 = W_{gp}$
$P_{x1} = 40$	$P_{cwl} = 40 + 20$	
$T_{wx} = 10$	$T_{wcw} = 10 + 5$	$T_w = 20 + 5 = W_{gw}$
$W_{x1} = 40$	$W_{cwl} = 40 + 20$	$VAB = 50$
$VAB = 100$	$VAB = 150$	

In order for one to understand this result, it is necessary to understand the entire production of the DCw is sold to the workers from the private and government sectors. The salaries paid to the DCw are reconverted into purchases in the respective sector, therefore, the enterprisers do not earn, neither profits nor losses, from the salaries paid to their workers. The inputs and outputs are the same. **The profits of the DCw correspond to the purchases of**

**the salaried workers from DX and DG.**

Now, due to the increased demand in DCw imposed by the taxation of the DX and DCw enterprisers, the demand (and the profits) of the DCw increased to 20 M.U. Then to meet the increased demand, the DCw enterprisers contract new workers<sup>80</sup>. **Thus, this caused an increase in production, employment, and the total amount of the salaries and profits of the DCw.** And the increased profits and total amount of salaries, which caused the government tax collection to increase, so they contracted more government workers, which added new demands in the DCw, and so on. Until the system stabilizes as in the above displayed pattern.

And the most interesting thing is – let’s consider the existence of the capacity of the idle and unemployed people – **the net profits from the enterprising sector does not change in terms of its value. There was only a redistribution between the producer department** of product(s) for exportation (whereas the net profits from taxes reduced from 50 M.U. to 40 M.U.) and the department of real wages/salaries (where the net profits are increased from 50 M.U. to 60 M.U.). Besides this, the available income (which is equal to the production of DX and DCw) increased from 200 M.U. to 250 M.U. It is worthwhile to say: **the available income (Yd) increased to the same amount as the tax collection and expenses of the government.** And the total income (Y) of the economy – which also accounted for its free services to the government, providing safety, education, and health services – increased from 200 M.U to 300 M.U.

The truth is that this is merely a hypothetical situation. Generally, the expenses of the regional governments: 1) also are spent on purchasing goods and services “overseas”; 2) they are also converted to high salaries (and “stipends”) which are

channeled to purchase luxury goods (as a hypothesis, “imported”); and above all, 3) **they are paid by taxes which are focused mainly on resident workers and secondarily on surplus added value (profits, interests, and revenues), which tend to be channeled overseas.**

Regarding the three above items, the third problem is the most difficult to face. In reality, the largest part of the local tax collection is from an indirect base and depends on consumption (as opposed to income tax, which is nationally defined); therefore the workers tend to contribute a part of the municipal tax money that is much greater than their participation in the income. Even if the indirect tax rates are uniform, **due to the capitalistic enterpriser expenditures, they are focused preferentially on “imported” goods, the embedded taxes in purchases are most of the time collected from “overseas”.**

But, it is worthwhile to express the impact of the government on this hypothesis, in that the institution which is based on the most harmful effect to this framework: with exclusive taxation of workers and channeling of all the fiscal resources to purchases outside of the region, whether it is because the government purchases inputs (paper, ink for printers, fuel for cars, uniforms, etc.) outside of the town/city, as the employees earn high salaries and spend it on luxury consumer goods and/or diversified service centers. In this case, the added value of the DX remains the same – 100 M.U. -, as this value is defined by the outside market. If the tax rate on salaries were maintained at 20%, and the participation in **gross** salaries in the **private** income were maintained at 50%, the workers in the DX sector would earn a net salary of 40 M.U. (= 0.5 x 0.8 x 100 M.U.). But this value does **not** correspond to the profit in the producer department of real wages/salaries. And this is because, in an economy in which the government workers do

**not** purchase local goods and the workers in the private sector **cannot** channelize more than 80% of the gross salaries for local consumption, the total demand in DCw will be as follows:

$$19) DCw = 0,8 Wx + 0,8 Wcw = 40 + 0,4 DCw$$

Whereas  $Wx$  and  $Wcw$  are gross salaries of the DX and DCw workers, respectively. As the gross salaries of DCw correspond to 50% of the Gross Value Added (GVA) in this department, the net salaries correspond to 40% of the GVA. Therefore

$$20) DCw - 0,4 DCw = 40$$

$$21) DCw = 40 / (1 - 0,4) = 66,66$$

**Productive Departments of an Outlying Regional Economy  
with a Government and Regressive Taxation Policy and Income  
Concentrator**

DX	DCw	DG
$Pxl = 50$	$Pcwl = 33,3$	$Wgcw = 10$
$Twx = 10$	$Twcw = 6,6$	$Wgx = 6,6$
$Wxl = 40$	$Wcwl = 26,6$	$VAB = 16,6$
$VAB = 100$	$VAB = 66,6$	

In this case, the installation of the government decreases the available income (from 200 M.U. to 166.66 M.U.), the total profits (shrank from 100 M.U. to 83.33), total salaries (that suffered from

the same decrease), and – and even at a greater loss – the private sector salaries (decreased one-third, from 100 M.U. to 66.66 M.U.).

In short: the ramifications of the government expenses are the most diverse. When the government operates at a deficit in any given territory, the consequences are similar to the emergence results from “TrS impelling” activities. In reality, in a country like Brazil, where the government social security is hegemonic and the majority of the income of retirees is a government expense, we can perfectly classify “permanent tourism” (whose impelling capacity is the main topic of the previous section) as a ramification of the government expense. The diffuse regional centers (such as the previously referred to town of Santa Maria) that specialized in the basic government services of education, health, and judicial administration, and security, receive a large amount of federal resources, which are responsible for (through multiplication) for the largest part of local income.

In cases of balanced budgets, with taxation equity (let’s say, when all the social classes contribute proportionally to the revenues in order to sustain the government expenses) and the government service workers are paid similarly to workers in the private sector and spend the largest amount of their incomes on the local economy, the government expenses also become impelling. The multiplier of these expenses is lower than the multiplier of the “impelling Xs” and the “Impelling TrS”. But, if the rendered services offered free of charge by the government are provided with good quality, the total income increases in equivalent standards as the estimated income from the private impelling activities.

Finally, if the taxation system is regressive and focuses fundamentally on the local working class, if the salaries of the government workers are significantly higher than the private

sector and are channeled to “importations” and the free of charge services from the government are bad quality, the governmental expenses will decrease the available income and the total income of the local and/or regional economy.

Generally, we recommend setting the intermediate standard as a reference, whereas the government expenses are impelling – more specifically, “G Impelling” – but display a lower multiplier value than the “Impelling Xs” and “Impelling TrS” multiplier activities. Finally, even when these expenses are deficit (or based on progressive taxation) and efficient, their impelling capacity, their long-term sustainability, and their capacity to create autonomy and productive diversification in regions with lower stimuli derived from private exportation impelling activities (Impelling Xs) or transfer-tourism (Impelling TrS). Therefore, as a general rule, we recommend the unified treatment of government expenses as an impelling expense whose multiplier is unitary (or less than the unit, depending on the incidence of taxation among social classes).

We have sought to translate these differences in the specification of the available income equation displayed below:

$$22) Y_d = (\beta X + \Upsilon \text{TrS}) / (1 - w) + \alpha G$$

Based on the equation above, the X exportations and the private “transfer-tourism” TrS are multiplied by the inverse participation of the profits from income ( $1 / (1 - w)$ ). These two expenditures are also pondered by the following parameters ( $\beta$  and  $\Upsilon$ ) which translate the level of vertical integration in the territory of the activities which participate in the exported goods supply

chains and services rendered to non-residents. On the contrary, we have assumed as a general rule (liable to make more flexible) the G governmental expenses which are financed by taxation resources and charged equitably to workers and capitalistic enterprisers. These expenditures are pondered using a  $\infty$  parameter, which defines the least value (until the lower limit, which is zero) the greater the: 1) the taxation rate on workers is vis-à-vis to the rate on the surplus added value; 2) the purchase of “imported” goods and services by the government; 3) savings and/or losses due to foreign expenditures (purchasing consumption luxury goods) of expenditures by the portion of government workers who earn high salaries.

### **Multiplying Patterns and Reflexive Activities**

Until now, we have considered multiplying activities, stimulated by demands derived from earnings in impelling activities, such as those which are restricted to consumption. And, in fact, this is its essential essence. Although, there is an ample range of impelling activities by the primary demand which are not irreducible to the consumption of families. For example: communication systems – newspapers, radio and television stations (open or cable) – which are, simultaneously, consumer goods and services focused on families and marketing tools of the most diverse activities and supply chains<sup>81</sup>. Likewise, there is a range of services being rendered, simultaneously to families and resident companies in the territory (apart from the companies producing local consumer goods, for exportation, serving the residents or the government). We consider the following, in telephony, postal, sewage, electric power networks, credit, and financing, private pensions and other systems. **These activities are**

**“reflexive”, as the demand on these is based on the associated primary incomes and activities (and supply chains) impelling Xs, or impelling TrS, impelling Gs. But they cannot be confused with activities exclusively focused on supplying consumer demands of residents in the territory, as they indistinctly serve the families and a set of companies residing in the territory.**

In short: multiplying activities – are those which correspond to demands derived from primary incomes, originating from exportation activities, activities serving non-residents (“tourists”) or activities supported by governmental expenditures – there are two types: those focused prioritarily (or exclusively) providing services to the local **consumer** demands – which are named as **“Reflexive C”** -, and those focused on serving the most distinct agents residing locally, whether they are consumers, companies, or governmental entities – which are named as Reflexive Generic or **“Reflexive Gs”**.

Finally, there are “mixed” activities serving non-resident demands (therefore, they are impelling), as well as reflexive (especially, the local consumer demands). A typical example of this type of activity is technical education and private university education. It is focused on serving the resident consumer demands in the territory (Reflexive Cs), as well as serving “semi-permanent tourist services” (Impelling TrS). Likewise, bars and restaurants serve the residents as well as diverse types of tourists.

The thing that makes the mixed Reflexive G activities different is in the latter cases as it is always possible to segment the “multiplied” portion from the “impelling” portion. And, despite the laborious effort, **this differentiation (or segmentation) has to be done whenever we deal with towns/cities or regions whose primary income originates mainly (or, even entirely)**

from typically mixed services, it is worthwhile to say, mobilized services for local consumers, as well as outside consumers<sup>82</sup>.

Fortunately, this situation is relatively rare, and for diverse reasons. Generally, the “centers with region” do not provide only general services, but also processing and export tradable goods. And the centers without regions (or a diffused region) are equipped with specific facilities (harbors, customs, picturesque tourist attractions, hotel networks, etc.) which essentially serve the outside user. This is for processed goods and exported goods to centers as well, related to facilities for specific purposes (or used for the majority) by the non-residents to provide special impelling services *vis-à-vis*, the reflexives, without imposing segmentation to mixed activities. Thus, it allows for sustaining the classification of activities which are found in this “limbo” as mixed, and consequently, assigned to the former equation together with the government expenses, without the incidence of the multiplier ( $1 / (1 - w)$ ), as part of the generated employment and income from these activities return right back to serve the local consumption demands, which are reflexive or “multipliers”. Thus:

$$23) Y_d = (\beta X + \Upsilon TrS) / (1 - w) + \alpha G + \Omega M$$

Just like in the case of the other variables, the value of the mixed activities is pondered by a parameter (in this case,  $\Omega$ ) which will be as big as the most vertically integrated in the territory to the chains which offer goods and services based on a mixed dynamic function, and on the contrary, as low as the highest value of income losses by way of the importation of inputs and the purchase of “foreign” services.

## The multiplier

Throughout this chapter and the previous, we have considered making flexible and making more complex the hypotheses of the model presented in the first part of this research study. But, there is still a simplifying hypothesis to face: the hypothesis about the purchasing of goods and services by resident workers in the region which are completely produced locally.

In reality, this hypothesis has already been objectively voided in that it was analyzed based on the function of the centers and the relationships of the reciprocal dependency among the centers and outlying regions. If the centers (among other functions) supply goods and services to the citizens in the outlying towns/cities in the same relevant-territory, then part of the “multiplier” demands from the outlying towns/cities leave. Besides this, when we recognize the value of the services focused on supplying the non-residents in the centers (the impelling TrS activities) it must be pondered by a  $\Upsilon$  parameter, which refers to the nearest the unit, the more vertical integration to the supply chain in the territory, we recognize, implicitly, that part of the demands for consumption goods and services of the outlying regions does not flow only to the centers, as well as flow outside of the relevant territory. For example: if a resident of a small town in the tobacco growing region of Rio Grande do Sul decides to renovate the electric appliances in the kitchen and drives to Santa Cruz do Sul to purchase them, he is imposing – from the point of view of the focus-territory, from the strict point of view of the outlying town/city – income is leaving from the “importation” of goods and services from the center. But the electric appliances sold in the department stores in Santa Cruz do Sul are **not** produced in that town. And not even in Rio Grande do Sul. They are only sold there. Therefore, as the expenditures in Santa Cruz were – for example - R\$ 10,000.00, this will be the income

value leaving from the outlying town, but only a small portion – something around 20% to 30%, if that much – of this value will be appropriated in Santa Cruz. A considerable part will be transferred to Porto Alegre (the state capital) as ICMS (sales taxes), more will be transferred to Brasília, as IPI (manufacturing tax) and even a majority will be sent to bank accounts of the producer companies that sold the goods (or to the financing agencies for purchasing electric appliances) from the store owners in Santa Cruz.

It is worthwhile to say: **the absence of barriers which characterize a national economy defines the following: all demands and expenditures involve some degree of resources going to other regions.** No matter how integrated the activities are in the territory – and, there is no doubt, that exportation activities present the highest degree of integration, followed by activities focused on supplying consumer goods and services to residents – these always cause outgoing resource transfers. These outgoing transfers are inherent in regional economic systems. As – we have considered since the first chapter of this research study – the more specialized regions of the country can only achieve (sustainable) production of goods which present absolute advantages and essential services and not transferrable. **What this implies is that the proposed identification in chapter two between the regional importations and the consumption and capitalistic investment ( $M = C_k + I$ ) is nothing more than a mere simplification.**

It is true, this is a much more realistic simplification and consistent with theoretical terms for the analysis of **regional** economies than for reproduction (more non-critical than usual) of the simplified model for defining **national** income which, is equal to exportations and importations by withdrawing the two system variables from the equations (if the commercial balance is balanced,  $X = M$ ; e  $X - M = 0$ )<sup>83</sup>; or postulate a single propensity to import

“m”, intending it is the same for all the expenditure variables.

In reality, as well as North teaches, each expenditure category presents distinct propensities from importation. This means that the strict presentation of the equation for defining the internal product of a region is:

$$24) \text{ PIB} = (C_w - m_w C_w) + (C_k - m_k C_k) + (I - m_i I) + (G - m_g G) + (X - m_x X)$$

Whereas  $m_w$  is the part of consumption by workers supplied by importations;  $m_k$  is the part of capitalistic consumption supplied by importations;  $m_i$  is the percentage of the value of investments supplied by importations, and so on. Now, usually

$$25) m_x < m_g < m_w < m_i < m_k$$

And this is inasmuch the considerable part of added value from exportation products of a region which has to be, necessarily produced internally. And as competitiveness is a function of the production scale (internal and external), and great scales mean great demands for inputs, so the exportation activities are those in which in the vertical integration process in the downstream and upstream direction tend to be applied more extensively in the territory.

Secondly, there are the government expenses, since this is a significant part for the payment of government worker salaries, which are contracted locally. Then, there is the consumption by the workers, as some basic services are supplied to families (education, health, commerce, leisure, etc.) and they have to be supplied near

the homes of these people. Besides that, (but further away), there is an investment, as a part of the investment expenditures go to civil construction, and even the towns/cities or regions that do not produce building materials, contribute to the employment of manpower. Finally, the capitalistic consumption tends to be centered on differentiated and produced goods (despite any exceptions) in large centers, where the concentration of income and wealth provides the means and makes feasible the emergence of the production of these goods on a competitive basis.

There does not seem to be any advantage in the readmission of capitalistic expenses and investments in the equation for defining the regional income. As a general rule – but subject to exceptions – the hypothesis on the propensity to import these expenditure items is near the unit (100%) which can be maintained. And this is due to two reasons. Regarding capitalistic consumption, even in territories that specialize in the production of luxury goods are subjected to the specialization logic. And capitalistic consumption is marked by diversity, by refusal to standardization; in such a way that importation (and, even, traveling to purchase outside the region) is the general practice. Since, this is related to the investment, even territories which contain equipment producing industries, usually this equipment is for exportation productive supply chains. And as we have adopted the linked classification system (this is the subject for further explanation in the next chapter), this equipment is more appropriate for classification as part of the impelling X systems<sup>84</sup>. Furthermore, civil construction is not only focused in enterprisers' plants, but also for building residences for especially family homes of the workers. The national accounts system of the UN even classifies new homes as an investment. But, this classification follows "sectorial" logic, approaching and unifying activities and products based on their technical characteristics. Notwithstanding, in the theoretical plan,

the only investment that is characterized as an "autonomous expense" is the capitalistic investment. The building of residences is a multiplied activity, which is dependent on the income previously earned as well as the workers' consumption in general. Therefore, we prefer to characterize civil construction as a chain whose dynamic function is to "mix", incorporating its products, income, and employment jointly with other polyvalent function activities (such as those expressed in the considerations before presenting the equation 19 above). We have already considered and explained the government, exportations, and tourism transfers, and their parameters  $\infty$ ,  $\beta$  and  $\Upsilon$  already been translated their influence to importations<sup>85</sup>. Therefore, it is still necessary to just incorporate the propensity to import the consumption of workers in the equation.

The Kaleckian hypothesis is applied that states the workers (while in this class) do not save; the sum of their salaries is equal to their consumption. And the available income is equal to the workers plus the net profit from the taxes, so that:

$$26) Yd = (Cw - m_w Cw) + P_L = (W - m_w W) + P_L = (wYd - m_w w Yd) + P_L$$

$$27) Yd (1 - w + m_w w) = P_L$$

$$28) Yd = P_L / (1 - w + m_w w)$$

Thus, if we return to the hypotheses expressed in previous sections on the defining net profits and their destinations (as related to local expenses and importations) then this shows the next equation for defining regional income:

$$29) Yd = (\beta X + \Upsilon TrS) / (1 - \mu w) + \alpha G + \Omega M$$

$$\text{Sendo } \mu = (1 - m_w).$$

## Available Internal Income and Available Regional Income

Since the beginning of this research study, we have confirmed that the Available Income (Yd) is equal to the GNP (Gross National Product<sup>86</sup>) minus taxes (T). Which is:

$$30) Yd = PIB - T$$

But the term “available income” is ambiguous. When we refer to it, in general, we think of the capacity expenditures of a person (or community) only associated to their current revenues (it is worthwhile to say: this does not include the buying power from loans or the sale of fixed assets). And this association is correct. It is still necessary to distinguish the available **internal** income from the available **regional** income. The internal income is the income **generated** in a given territory. The **regional** income is the income **appropriated** by agents who live in the territory. The difference between the two kinds is the sum of the **Balance of Payments from Incomes and Unilateral Transfers (SBRTU)**.

$$31) Yrd = Yid + SBRTU = Yid + (RRE - REE) + (TURE - TUEE);$$

Whereas Yrd is the available regional income; Yid is the available internal income; RRE are the incomes received from outside (profits, interests, dividends, salaries, rents); REE are the incomes sent overseas (composed of the same items); TURE are the unilateral transfers received from overseas (allowances and/or donations without any services rendered) and TUEE are the unilateral transfers sent overseas.

The importance of the distinction between internal income and regional income is enormous. The **internal** income from towns/cities contains their complex productive systems and the value added tends to be higher. But the regional income can correspond to a tiny portion of the internal income, if the generated income in the territory is sent overseas, where the residences of the agents who are entitled to it. On the other hand, the central towns/cities are capable of supplying high-quality services and tend to attract residents who earn incomes generated overseas; therefore the regional income can be greater than the internal income<sup>87</sup>.

So to illustrate the difference, it is worthwhile to return to the simplest version of our model for defining income, where there are 1) there are two departments, the exportation (DX) and the workers' consumer goods (DCw); 2) the added value in the exportation department is 100 U.M.; 3) the participation of the salaries in the income is 50%; 4) the propensity to import workers is void. Only that, now, we will introduce a new element: all the profits are transferred outside of the region, as the companies who work locally belongs to non-residents. In this case, the propensity to import capitalistic enterprisers is not important, as all the profits do not stay in the region but leaves. The available regional income (Yrd) will be as follows:

$$32) Yrd = Yid - SBRTU = [100 / (1 - 0,5)] - 100 = 100 = 200 - 100$$

Now, it can seem that, considering our hypotheses, the difference between Yrd and Yid is not significantly important. After all, in the previous model, the profit also flows out and it is converted into capital goods and luxury consumer goods. But this conclusion is not correct. The fact that the local enterprisers

only buy overseas defines that their expenses are not multiplied internally, in the same way as the expenses from the workers, which stimulates the creation of all the DCw. But the local appropriation of profits was not insignificant. Its impact on the income and regional dynamics is felt in several ways, so to highlight some of them: 1) the possibility to finance part of the government expenses by a surplus in taxation<sup>88</sup>; 2) the stimulus to develop and increase the Mixed and Reflexive scale of activities<sup>89</sup>; 3) the local control on retained profits, which are the main means of financing investments for enlarging and diversifying businesses.

Besides this, if the profits are sent outside and spent overseas, then the local commercial balance would be imbalanced. The region would export, but would not import anything. Therefore, the transport companies would ship the merchandise in containers and then they would return empty. This pattern of operation would end up burdening the local production for exportation, and decrease the competitiveness of the territory. And as the return shipments are pre-paid leaving the country, the costs of importation would lower the costs and thereby encourage the importation of consumer goods by the workers. And the final consequence will be to enlarge the propensity of the salaried workers to import, and consequently decrease the local multiplier.

Now, the above comments makes one recognize the fact that we cannot simply employ equation 25 to define the available internal income (Yid) and subtract the result from the Balance of Payments from Incomes and Unilateral Transfers (SBRTU) to calculate the available regional income. And this is because the fact is the profits will be – or not! – appropriated in the territory which will have countless consequences on the pattern of financing of government expenses, for measuring the “G reflexives” activities and Mixed for the multiplier, and for the expansion of the installed

regional capacity.

On the other hand, it is necessary to understand that our exercise here is essentially theoretical: we are seeking to define and hierarchize theoretically the variables that define the GNP and the available regional income. Our objective is **not to calculate** the GNP or the Yrd based on their components. And it is not even necessary. In Brazil (and in countless other articulated countries to the UN system) the value of both is calculated annually by the IBGE and the state institutions responsible for processing statistics based on fiscal data, economic surveys, and annual domestic indexes of the IBGE (Annual Industrial Surveys, Annual Commercial Surveys, Annual Service Survey, National Survey on Domestic Sampling, etc.)<sup>90</sup>. Thereby, the equation for defining internal income and regional income must not be considered as an algebraic system focused on its quantitative definition, but as a theoretic system focused on understanding the relationships among variables.

If so, what is important is to understand the consequences of the income transfers generated in one territory and transferred to another territory where the agent resides (or the company is installed) to have the property rights on the outgoing income. And the consequence is the decrease of income (and/or multiplier) from the territories whose unilateral balance of trade income and transfers is negative, and the increase of surplus income in territories. If we reconsider the equation 33 above, it is easy to notice that the Yrd value does not change if we first calculate the internal income (Yid) and subtract the SBRTU, or, alternatively, if we consider as the initial point to calculate the **part of the exportations which is appropriated internally**. In reality, equation 28 reproduced below considers the same result as in equation 34, whereas the part of the multiplied exportation value is only for

what stays in the territory, the salary portion ( $Xw$ ):

$$33) Y_{id} = X / (1 - w) - SBRTU = [100 / (1 - 0,5)] - 100$$

$$34) Y_{id} = Xw / (1 - 0,5) = 50 / 0,5 = 100$$

If we adjust each one of the variables entering in our system, in such a way as to operate with the value that corresponds to the net commercial balance of the income and unilateral transfers, the equation to define the income theoretically can be maintained essentially the same. In reality, just incorporate a final adjustment variable for the focus-territory cases (or the relevant-territory, depending on the interest) to present a positive net balance in financial transfers which is irreducible to the previous incorporated variables. And this defines the equation for the definite regional income:

$$35) Y_d = (\beta X_r + \text{TrSr}) / (1 - \mu wr) + \alpha Gr + \Omega Mr + \omega Abs$$

Where  $X_r$  is the value added to exportations appropriated in the region;  $\text{TrSr}$  is the value added to support services to non-residents appropriated in the region;  $Gr$  are the expenditures of the government on regional agents;  $Mr$  is the value added to mixed activities appropriated in the region;  $Asbr$  is the commercial balance adjustment of the income and the unilateral transfers associated to the entrance of incomes from overseas by owners who reside in the territory; and  $\omega$  is the multiplier of the  $Asbr$  value which is the expense in acquiring consumer goods and reflexive generic services in the territory. Note that, contrary to the  $\text{TrSr}$  (the transfers associated to the purchase of services in the territory),

the value of the  $Asbr$  is not multiplied by  $1 / (1 - \mu wr)$ . And this is because we know the principle, if the values transferred to the territory by way of property rights ( $Asbr$ ) the expenses will be in the territory or they will be transformed into financial savings and transfers, and afterwards, invested in other regions. The part spent in the territory will be multiplied. The part that is saved (or stored) will not have any effect in the multiplication. And, for this reason, it is not possible to propose, at first, for  $\omega$  to have the same value of the multiplier of the  $X$  and impelling  $\text{TrS}$  activities.

### Conclusion: equation for defining the regional income and planning

As you can see in equation 30 above, all the variables for defining income are pondered by parameters that (among other criteria) they increase based on the degree of vertical integration in the territory and decrease based on the greater participation of importations in inputs and products from other regions. There is nothing as simple as extracting this equation after concluding one of the most effective government policies for territorial development which is to attract investments for the purpose of “substituting importations” and to add value to the territory itself. There is nothing as simple as this, but it is completely wrong.

In first place, this is because the regional specialization and commercial integration of the regions are in the same country, which is an imminent characteristic and insurmountable in modern mercantile economies. Secondly, this is because of the (artificial) decrease in integration with the external market, which is a two-edged sword: whoever does not buy overseas, does not sell there<sup>91</sup>. Thirdly, this is because – as we had seen in the above section

six, – the attraction of investments focused on the substitution of importations does not guarantee income generation in the territory will be appropriated in the territory. On the contrary: if the property is external, the incomes tend to leave and thereby multiplying the expenses.

But the fundamental circumscription for the project of substituting importations and adding value by all means to the supply chains is pointed out and elaborated by North in his canonic texts in the 1950s. Despite exceptions, the integration of the set of links to the productive chain in the territory is **not** only an issue of political choice, but technical-economic considerations of feasibility. Some activities – as the wine production in the Gaucho mountains – this not only requests, but imposes the development of downstream links in order to process and transform the grapes into wine. And considering the abundance of wood in the region and the absence of entry barriers (which may be on the technological order, or scaled) in the lumber sector, the wine production will incorporate other upstream links, such as the production of barrels, which will become the basis for an emergence (and, nowadays, this has become very important) for the local industry: the furniture industry. On the other hand, there are agricultural activities that display chains relatively short to the downstream (such as rice: which is just dried, shelled, and put in bagged), or to minimize the costs and generate the maximum economic yield when the final processing is performed in the importer center (such as is in the case of tobacco and soy beans).

**In reality, the first step in any strategic planning is to evaluate the level of “integrability” of the activities and “impelling X” chains**. The starting point of an evaluation is: 1) interviews with the business and labor union leaders in each distinct chain, for the purpose of understanding and mapping the potential and obstacles

in their respective integration; 2) analysis of the final structure of the similar chain which has reached maturity in other territories (whether they are in the same country or overseas). The objective of this analysis is to evaluate if the interposed obstacles to integration are structural and insurmountable or circumstantial and possible to overcome. Simultaneously, it is necessary to evaluate if the main impelling chains in the territory have developed secondary links which are capable of becoming autonomous<sup>92</sup> and what is the potential of their respective integrability. Once the potential market chains have been identified, that have a tendency to integration and stimulate the emergence of secondary generator links of new chains, the obstacles must be mapped so they can develop in the territory and define the necessary and sufficient policies in order to overcome those obstacles.

In the case that the focus-territory is an urban center that is highly dependent on external demand (whether from “outside”, from the rest of the same region, a diffused surrounding territory, or even, the entire national territory) based on its service network, fundamental growth strategy is triple: 1) evaluate the competitive advantages and disadvantages of the center being analyzed regarding the competing towns/cities based on polarization and defining effective policies to leverage the advantages and decrease the disadvantages; 2) enlarge the range of services rendered to the non-residents, seeking to exploit the inherent synergies on the distinct “touristic” demands for the services in the center; and 3) narrow its connections to the surrounding area through integration to the productive structure of the processing systems and technical support to the impelling X chain activities of the satellite towns/cities and territories. Finally, it is fundamental that the centers pay attention to their dependency relations *vis-à-vis* to the demands that originate from their outlying areas and seek to contribute to the reflections and proposals of the economic policies focused on

overcoming current and potential obstacles for the growth of the activities and “impelling X” chains of the surrounding areas.

When the focus territory is a polarized town/city or region (or if you prefer to consider it as a satellite) there is a double strategy. Firstly – as we have already referred to previously – it is necessary to evaluate the potential and obstacles to the development of its impelling chains and develop productive diversification policies whenever necessary. But, it is equally important to seek to minimize resources leaving and going to the center(s) through the implementation in the respective focus-territory of a basic system (more efficient and qualified) for the supply of services. Specifically, it is even more important to qualify the local commerce and the basic educational and health government systems. The core feature in commerce is that it in fact becomes the main “drain” of internal revenues going leaving the satellite territories. And the deficiencies in the basic health and health care systems contribute to increase the drain, as the citizen will be forced to travel to the center in order to benefit from the basic government services and based on this rule, it tends to dilute its transportation costs and take advantage of the opportunity to benefit from the advantages of the prices and diversification of the larger commercial centers. Furthermore, local control of basic education (and, if possible technical) makes it possible to make the educational systems compatible to the specific needs to qualify the local workers to better supply the needs of the territory<sup>93</sup>. As stated in the terms of equation 25 displayed above, the objective of these policies is to expand the  $\mu$  parameter to be able to ponder the participation of salaries in the income ( $w$ ) and define the systemic multiplier.

Despite the “Impelling G” activities present a lower multiplier than the “Impelling X” and the “Impelling TrS”

activities, the action of the government is absolutely essential to the regional and local development. Firstly, because the initiative and the coordination of the regional development policies referred to previously must **start** from the government or, at least, count on its militant support. But, this is not all. The government plays the crucial role in increasing the multiplier and the expansion of the  $\infty$  parameter which multiplies its expenses and defines its respective percentage to transform the available income to the local population by way of fiscal policies. The greater the taxation incidence is over that segment of the population whose consumption patterns (and the overall expense) implies resources leaving and lower the taxation charges imposed on the low-income population, the greater the autonomous expense multiplier will be and the greater the increase in available local income associated to the government expenses.

Unfortunately – as it has already been observed – the local governments rarely adopt more consistent taxation policies to leverage development. This occurs, partially because a considerable portion of the local taxes are from an indirect base, so that the high-income brackets, which channel their expense out, who are taxed outside the territory. Besides this, the hegemony of development exogenous projects (based on the concession of subsidies to attract companies with a potential to “modernize” the local productive headquarters) disseminates taxation practices to stimulate the concentration of income, which are going contrary to the theoretical practices consistent with local development. And, finally, it is necessary to understand that the broad predominance on the exogenous theses does not express only ignorance on the most modern literature on regional development: there are very solid economic interests favoring this “ignorance”.

Notwithstanding, none of the limitations previously stated

is imposing. And there are taxes levied by the local government which focus on property assets (such as building and urban land taxes, IPTU) and that may (and must) guarantee the progressive nature of local taxation. Besides this, the same indirect taxes charged by the city (such as service taxes of all types, ISSQN) can be administered and differentiated for the purpose of guaranteeing the higher taxation rates are charged from companies who provide services, as opposed to services rendered by low-income families.

Finally, the government policies focus on support of mixed activities must be exponential to its own impelling size. As we had pointed out previously, civil construction and technical education are typically mixed activities, in as they provide services to families (building homes, local education) as well as companies that invest in the region (in the case of civil construction) and students from other locations (in the case of education). Whenever the local administrations support the development and qualification of these services, they are also enlarging their own impelling dimension *vis-à-vis* to their multiplicative dimension. This implies bringing the mixed activities to the “Impelling X and TrS” activities nearer & by extending and enlarging the income of the territory by a multiplied value.

## Chapter 6

### **Chains, Bottlenecks, Arrangements, and Economic Development Planning**

#### **Introduction**

Since the first chapter of this study, we have pointed out some peculiarities of economies and (inter)regional changes *vis-à-vis* to economies and (inter)national changes. Throughout the first five chapters we have sought to express the following:

1) regional economies tend to be more **specialized** than national;

2) specialized activities return to supply markets outside the local region (their products are exported to other regions or nations) **and this value is one of the main<sup>94</sup> sources of regional income;**

3) regional exportation products, even when they are the object of local processing, which are usually rooted to edaphoclimatic peculiarities and the availabilities of natural resources in the territories; therefore **the actual economic expression of the primary regional production cannot be**

**evaluated by the percentage of the gross aggregated value of the agribusiness and mining industries;**

4) **the regional activities which return to supply the internal market are reflex** activities (or **multiplied**, in the Keynesian concept) of the impelling activities in general and especially the exportation. Its expression related *vis-à-vis* to the impelling activities are a positive function **of the distribution of income and property**, of the participation of profits in the taxation revenues and the regional appropriation level of added value in the territory;

5) is the size of the relevance of exportation activities (and the size of its link to geophysical characteristics and distributive patterns in the territory) that the **productive specialization** is the first reference to any **consistent theoretical regionalization** for the purpose of economic planning (it is worthwhile to say: any regional division **for the purpose of economic planning** is capable of controlling the bias imposed by MAUP);

6) the exportation activities with the greatest long term impelling capacity are those which tend to vertical integration in the respective territory, taking on the shape of relatively long productive chains whose links are associated to the most diverse segments (activities classified based on technical similarity criteria).

It seems like the six main arguments listed above in this research work, five have been sufficiently clarified and well-founded. So, it would be fitting now to go into further detail and theoretically discuss the sixth and the last argument. Even, because, it is essential for defining and separating into categories the action plans to comply with the Regional Development Planning. In the next section, we will introduce in general terms, the principle of vertical integration diversification of impelling X chains. In the

next section, we will study the general principle more deeply, introducing new arguments to defend the centrality of the chains as well as a starting point (potentially surmountable) in the territorial productive diversification. In the fourth section, we will introduce the most general principles on identifying chains, based on information on the sectorial classified economic activities (whose first reference is the ISIC of the United Nations, which became the CNAE system in Brazil). In the fifth and last section, we seek to align our conclusions and point out the most important derivations of the analysis on chains in regional planning development.

### **Vertical integration of impelling X chains and productive diversification of the outlying economies**

Up to here, we have usually referred to impelling **X activities**. But, strictly, there are no impelling **X activities** which are integrated to any **chain**. After all, the factor that defines an activity as an impelling X activity is that it produces a product which ends up serving an external market. What this means is that besides being produced, this product will have to be transported; involving the solidarity of (at least) two activities in the same system: production and transport. Also, nothing can be produced with purchasing inputs. And, in a mercantile system, production returns and it is sold. Another two links are introduced into the production chain: the wholesale business and/or retailing inputs and final products. And finally, even processing requires the transport of the primary product, whether it is the most basic material – as just drying grain, for example – emerges from our own industrial link (since it is not just another activity, but) in the impelling chain. In short: no matter how small or simple it is, any X impelling activity constitutes a chain surrounding itself.

Throughout chapter five, we tried to demonstrate the impelling capacity in each “linked activity” which will be as large as the number of agents who earn revenues from therein and: 1) work in the territory, living, and spend their revenues there; 2) purchase **produced**<sup>95</sup> goods and services there, or at least, **supplied** by local commercial firms.

Now, goods and services purchased in the territory by resident productive agents can be classified in two big groups: consumption goods and services and production goods and services. The main, determining factors are based on the following: if the two types of goods and services are produced locally or they are imported: 1) the scale of the regional demand; 2) the peculiarities of the demand for goods or services in the region; 3) the barriers for new companies entering in the sector where the demand is present; 4) the transport costs and/or storage of the delay time associated to the importation of the goods or services.

The greater the scale of the **regional** demand is for certain goods or services, the greater the probability is that this demand will be great enough to make the emergence possible of at least one plant in the region capable of operating at a minimum competitive<sup>96</sup> scale. Likewise, when the demand of a non-standardized region, but peculiar (due to specific patterns of consumption and/or productive-techniques in the territory), it is most probable that a local supplier has been able to understand and supply these demands more competently than an external supplier, as this is what stimulates the development of local productive chains.

On the other hand, there are goods and services whose local supply implies the transposition of extremely high entrance barriers, whether they are technological (including patents), or the least efficient scale, or initial capital volume, or the installation time and

repayment of equipment without net profits, whether instability (uncertainty) on the demand profile or on the dominant technical patterns in the future. In these cases, even though the local demand is high, it can be insufficient to justify the risks for installing plants focused on supplying inputs (upstream) or processing products (downstream). Especially when the logistic system of the territory is diversified and the transport costs for obtaining inputs from outside and/or sending sub-products outside for processing are relatively low<sup>97</sup>. Otherwise, if the barriers to enter do not impede entrance and the transport & storage costs, and the delay time for external supply are high, the local production as a rule will be an exception and thus supply will be external. The exemplification of each one of these situations can be useful.

Few towns and cities provide a productive system as specialized as to not have a bakery, a medical clinic, a dental clinic, or an elementary school. Why? Because the barriers to the entrance of these sectors are minimum, the cost of efficient transport for fresh bread, elementary school students, doctors’ and dentists’ offices are extremely high, and expect to be supplied emergency care (such as in the field of health-care, for example) are extremely high. These services are, however, ubiquitous: they tend to be present in the most diverse locations. And there are two aspects in this trend towards ubiquity: considering the fact, that there are rare cases of territories that do not have at least a bakery, so it is quite rare for a wheat crop growing region to be bread exporters. Likewise, soybean growing regions tend to export soybeans, plus the oil, margarine, or vegetal protein: the transport costs of these products are higher than the transport costs of the raw material and the barriers to the entrance of these processing businesses are extremely low. Right away the final products from the wheat growing chain and soybean growing chain tend to be produced in the consumer centers, while the territories that produce the raw

material tend to sell it *in natura* or with the minimum processing necessary for transport.

There are goods and services on the other extreme range of possibilities, whose production is circumscribed by a restricted number of businesses and territories. The entrance to these productive sectors is limited by extremely demanding entrance barriers. As a general rule, these activities are characterized by large scale economies (as the larger the plant and/or company is, the lower the unit costs of production) and due to this fact, the transport costs and storage of the respective goods produced are relatively low (or, at least, lower than the added production costs in optimal smaller scale plants). Thus, even in outlying regions that display great dynamism and high volume demands of this type of product, rarely are able to achieve to provide the means to keep internalized the respective industrial production plants in the territory. The few and large plants which produce inputs and equipment with such characteristics normally are installed in outlying industries of primary urban centers and/or industrial districts in multi-module logistic centers (so as a general rule, they are articulated to a large sea harbor), and distribute their production by way of a complex and broad logistic network which serves the centers without a region or diffused regions.

There are two extremes – ubiquitous activities (such as bakeries, ineffective medical clinic, drugstores, gas stations, car garages, etc.) and sparse and concentrated activities in regional centers or diffused region (such as petroleum refineries, car assemblers, steel-making plants, large scale hydroelectric plants, etc.) – there are countless activities whose minimum scale of operation is relatively high (therefore this depends on a significant demand in order to be economically feasible), but whose barriers to enter, without being negligible, as well as not being

insurmountable, accepting the entrance of new companies and they have not yet followed the entire learning curve associated to learning by doing. These are activities which **must** be internalized in the outlying regions, and then by doing this, they define the **peculiar competitiveness** and on the path to diversify into emerging regions.

Now, I ask you: what (or which) activity(ies) present a sufficiently high demand in an outlying territory to stimulate the installation of a supplier plant with the above characteristics? The answer is: that(those) activity(ies) in which the outlying territory is **specialized; they are impelling X activities.**

Especially, those activities which demand **non-standardized inputs, produced by special order** (according to the specifications of the requestor) **or produced according to variable patterns and influenced by peculiarities of the productive systems of distinct regions.** In these cases, the geographic proximity between the supplier and customer is crucial for decreasing business costs, specification costs, and production of prototypes and any (eventual) costs for adaptation and reworking for perfect adjustment to the final non-standardized product.

There is no way to underestimate the importance of the above conclusion for regional development planning. We are attempting to present this principle which is so diffused in consolidated economic theory yet – surprisingly! – now commonly analyzed. In reality, **this is the principle that underlies the entire industrialization model by substituting importation.** It confirms that the path of **industrial diversification of the lowest cost per unit of benefit is that** which returns to serve local demands: **1) expressed in volume; 2) essential for reproduction by the requestor (it is worthwhile to say: any discontinuity of**

**supply imposes extremely high costs to the buyer, whether this is due to seasonality, or price instability and/or exchange and/or availability of borders, or due to a peculiar feature of the transaction, equipment adaptation, and maintenance, etc.)<sup>98</sup>.**

Unfortunately, we cannot scrutinize the principle of diversification by vertical integration and the substitution of importations as strictly as it deserves in this study. If we did that, it would impose an extremely long circumlocution, and that would detract from our main objective: which is to define the foundations for planning regional economic development based on the identification and hierarchization of activities/impelling chains. But, it is possible to focus on some elements of this principle – hereafter named as **“The Interlinking Diversification Principle”** – which allows us to differentiate its relative effectiveness in chains characterized by distinct industrial production patterns<sup>99</sup>.

And before anything else, it is necessary to introduce a crucial distinction between industrial transformation processes: continuous processes and manufacturing processes. Continual process industries are characterized by their indivisibility and inseparability in diverse moments of production. After the raw material and inputs transformation process is started, the production process cannot be halted until it is concluded, if it is, it will harm the final product quality (or even, the industrial equipment used in the process). These production systems present two typical characteristics: 1) their products, or their homogeneous results, or present limited differentiation and scheduling capabilities in “batched” production processes; and 2) considering the indivisibility and imposing interlinking throughout the entire process, the necessary capital volume for installing a competitive scaled plant tends to be very costly. Industrial sectors, such as, chemical (including pharmacy, fertilizers, and agro toxics), steel-

making, the mining and processing of petroleum and gas, rubber and plastic are examples of industrial sectors whose typical productive systems (and despite the exceptions) are continual processes. **Productive chains which input products basically originating from these industrial sectors rarely go through processes of vertical integration by interlinking in a single territory.** And this is because process industries capable of meeting the demand from more diverse territories surrounding its prime-sized centers (in a diffused region) or those whose centers without regions contain broad logistic system multi-models.

Then in a contrary manner, the productive processes in industrial plants based on manufacturing are characterized by discontinuity. These industries are relatively intensive in manpower vis-à-vis to the continuous process industries; they are used as a pattern for applying the three classical systems for controlling work, production, and generating stock processes: Taylorism, Fordism, and Toyotism. The essence of manufacturing productive systems is based on the fact that distinct tasks and activities are independent from one another. Its unification (in terms of setting up the Ford pattern, for example) which is a strategy adopted conscientiously and that returns to facing inherent costs for separating the tasks and the production of parts for stock. This strategy is not imposing. On the contrary: it contrasts the pattern that states that what is “normal” for production in the manufacturing profile is discontinuous.

Now, the divisibility of tasks in manufacturing systems bears two extremely relevant ramifications: 1) the minimum competitive scale of any plant tends to be lower than the minimum competitive scale in continuous systems, as one plant can produce only one part (one part, for example) in a well-built assembly of components; 2) the actual independence of each activity in the

production system makes it possible to produce non-standardized components, yet differentiated when considering specifications and specific needs of requesting companies (and/or territories).

It is unnecessary to clarify the fact that these two characteristics facilitate the excessiveness of vertical integration **in the territory** of the **manufacturer links** in the impelling X productive chains. And this integration process depends on the speed, intensity, and successfulness as compared to the good performance of the following items: 1) costs associated to the “delay” for inputs and imported equipment; 2) the cost of stocking these respective inputs and equipment; and 3) the necessity of adapting the inputs and equipment to special needs of the customers in each territory. One example can contribute to improving one’s understanding of this phenomenon.

The north-eastern region of Rio Grande do Sul State was one of the pioneers in adopting the agricultural production systems which was characterized as the “green revolution” in Brazil during the 1960s and 1970s. This revolution involved the increasing adoption of chemical fertilizers, agricultural herbicides (agro toxics), hybrid seeds, and agricultural mechanization. As this process went on, the productive profile in the north-eastern region of Rio Grande do Sul State changed drastically, and almost the entire demand for new agriculture started to be produced, in a greater or lesser extent, in this vast territory. Nevertheless, the only segment which started to constitute an actual diversified complex and increasing autonomy related to the **local** demand for inputs and equipment was the metal-mechanical segment due to the production of agricultural machines and tools. And why was this?

The answer was not found – evidently – based on the demand for more plows, tractors, harvesters, silos, and warehouses to be

greater or more relevant than the demand for fertilizers, selected seeds, or agricultural herbicides (agro toxins). The real difference is found in the already listed elements: 1) the metal-mechanic has manufacturing characteristics, therefore its integration to the territory can be gradual; 2) in the transportation costs of agricultural machinery parts and equipment, as well as the respective storage costs are extremely high<sup>100</sup>; 3) the costs from delays in delivery or repairing parts of an agricultural machine can be extremely high, as agriculture is strongly controlled by seasonality (a one week delay can impact and make the production from the whole year unfeasible!); 4) the differences in the agrarian structure and the edaphoclimatic patterns (pluviometer, soil composition, degree of terrain slopes, propensity for erosion, etc.) in distinct territories bring about adaptations in the tools and equipment, which in turn stimulate local production and facilitate the overcoming of restrictions associated to patents<sup>101</sup>.

The above listed elements are found as the differences announced by North in his canonic studies of around 50 years of activities with more or less “integration potential” in the territory. We have already referred to these differences, exemplifying the diversification processes of the gaúcho wine crop (which has been especially successful), the grain production in the northeastern part of the Rio Grande do Sul State (which has been only partial and focused on the metal-mechanical sector), and the tobacco crop in the State (which was truncated to the upstream and downstream directions). The most precise understanding of these inherent differences in the integration processes and productive diversification of distinct primary bases of exportation depends on other elements, which will be presented in the next section of this chapter<sup>102</sup>. And before going on, however, it is appropriate to present some ramifications of the above theoretical developments.

As we have confirmed, the identification and hierarchization of impelling X productive chains in given territory is the starting point necessary for all and any developmental planning. And, as we have repeated several times, the first criterion of hierarchization of chains is the overall volume – direct and indirect – of employment generated in the territory and the overall volume of the income – direct and indirect – generated, appropriated, and spent in the territory. However, now, there is a new emerging hierarchization element. Besides the **current** integration of the distinct chains, it is necessary to consider the respective **potential** integration. And the integration potential in the future is based on two factors: 1) on the types of inputs and the requested equipment by the central activities of the chains in developmental activities in distinct territories; and 2) in the perspectives of the market for the goods produced in the central link of chain being implemented. The more the forecast demand is in the future on the central links<sup>103</sup>, the greater the production scales are and the greater chances for attracting investments returned from the supply of inputs and equipment in the upstream direction and the investments returns to processing downstream. And the greater the demand for inputs and **manufactured** industrial equipment (as opposed to inputs produced in a continual process) and the greater the cost savings in the transport of processed goods (as opposed to the transportation costs of the respective goods in natura) the greater will be the chances of differentiating the regional production achieved by way of vertical integration of a single (or a few) basic production chains.

### **Regional Chains and Local Arrangements: the principles of Goldratt, Hirschman, and Penrose**

We dedicated the entire third section of chapter five to demonstrate the great influence of distinct fiscal strategies from diverse governmental instances on the dynamics of local and regional economies. But the impact on the governmental actions transcends to issues on the impelling power of deficit spending or surpluses and the increasing or reduction of the multiplier associated to progressivity or regressiveness of taxation. The **destination** of overall government expenditures (and, especially in its investments) is at least as important as the financial pattern of these expenditures.

It is our opinion that the best way to introduce this issue is to recovery the “Goldratt bottleneck principle”. Elyahy Goldratt (1947-2011) was an Israeli physicist who applied the principles of resilience to the entropy in the administration of production processes. One of the basic principles of the physical theory of entropy is that systems are organized “in a line” or a single interlinking – in which each link of the chain communicates with only two others, the previous and the next – they are very subject to the entropy of the “networked” systems (in which each link is connected to several other links). In case of single interlinking systems, the break (or loss of function, or unadjusted definitions) of a single link is harmful (and, at worst, it makes it unfeasible) the operation of the overall system. In spite of this being an absolutely elementary principle of the entropy theory, Goldratt applied to it a peculiar utilization regarding its respective derivations for the administration of the industrial production systems, which are usually organized based on “single interlinking assembly lines”. His conclusions are as diversified as instigating and his most important works are part of the basic literature in any economic

analysis<sup>104</sup>. Although, now we need to pay attention to the following key element, which can be resumed as follows:

Let's imagine a chain composed by **similar** × links, **but not identical**, therefore some links are weaker than others. In reality, each link presents a specific degree and differing in its resilience to stress, therefore it is possible to hierarchize them and define their order from the strongest to the weakest. The capacity of the chain to be able to bear the stress is defined by the resilience of the weakest link. Any investment in strengthening the other links will be an idle and inconsequential expenditure, if the object is to enlarge the capacity of the entire chain to bear the stress. Goldratt presents this same principle based on another image which is equally elucidative: the constraining bottlenecks of the flow of a liquid from communicative vessels. Such as in the case of the chain, the final drainage of the liquid flows through distinct vessels and cylinders with distinct diameters that will be defined by the one which presents the smallest diameter, which is the circuit "bottleneck". Any investment in enlarging the other diameters will be inconsequent, and will not contribute in any way to enlarge the final flow. The only investment capable of enlarging the overall drainage is one which enlarges the diameter of the tightest bottleneck.

Goldratt entitled the system of investment prioritization based on bottlenecks as the "theory of constraints". This theory is nothing more than a generalization of the Keynesian multiplier principle. According to Keynes (and Kalecki), whenever productive resources are available (something that defines the potential supply) exceeds the actual demand, the latter functions as the "bottleneck" of the system. In these cases, any enlargement of resources made available to the system (including through resource saving innovations), would be ineffective, as well as

counter-productive, as it would enlarge the capacity of idleness and discourage new investments. The only "investment" capable of enlarging the flow of the product and income is one which enlarges the diameter of the systemic bottleneck, located in the final demand. The enlargement of the latter through government expenses is the key to enlarge the overall flow of the product and income.

The Goldratt model follows the exact same logic. Its only difference is that it expresses the possibility that the tightest bottleneck is not found in the demand, but in some "link" (or an intermediate cylinder, or vessel) in the production flow. But the result is exactly the same: after enlarging the bottleneck, all the production is enlarged until the limit defined by the new bottleneck. And, once again, the only relevant investment to enlarge the product and income flow is one which enlarges the narrowest part of the system, and thereby it strengthens its weakest link.

The relevance of this principle is for the planning of regional development is unambiguous. Firstly, this is due to a structural problem in the planning of government expenses. As Hirschman observed, in his most extensive study, one of the main obstacles to the development of outlying regional economies:

"is the reluctance of many Governments ... to define priorities and implement them consistently. For example, when countries begin to put into effect audacious plans for highways and power plants, many times they tend to spread out the available funds to a greater number of cities and highways. This trend presents, doubtlessly, political causes and also explanations can be given showing that fewer projects are easier to devise than

a larger number. But, in a more fundamental manner, the resentment in making choices, which is maintained with visible reluctance, can be .... explained by the basic feeling that progress must be distributed fairly to all corners of the community" (Hirschman, 1961, p. 32).

This difficulty in prioritizing is, without a doubt, one of the most notable characteristics in societies marked by disseminated social-economic neediness (per capita income, employment, health, education, technology, sewage, infrastructure, environment, security, human rights, etc.) and by the hegemony of the utopist-ideological anti-individualist systems (whether they are egalitarians or strict hierarchy, but averse to the deepening and/or change of the inequality standard). In societies with such characteristics (and the reference by Hirschman to Latin America is explicit!), which usually opts for an administrative pattern of government budget marked by the equitable distribution of "crumbs". Such a pattern does not allow for the adequate facing of countless problems which hinder the economic development of the outlying regions and nations, but allow for the capturing of electoral political benefits of a compromise pretense from government powers in facing all the neediness and complying with all the demands.

Now, it is easy to notice that the principle of hierarchization of government expenditures in general (and especially in investments) based on the potential of respective multiplication through the widening of bottlenecks is a greatly potential tool for facing the chronic difficulties in the prioritization of governments. But the efficiency and effectiveness of such an instrument will be as big as the capacity of the voters in understanding the adopted prioritization criterion. And this comprehension will be as large as the number of agents involved in the "bottlenecked chains".

This is what happens, that it is virtually impossible for the emergence of impelling X activities unless there are links which emerge upstream and downstream whose capacities (or "diameters") are imbalanced. As a general rule, the new links are insufficient to completely supply the demands of the central links. Eventually, the opposite occurs: if the minimum competitive scale of some of the new links is too high, they can present a high capacity for the consolidated central links. Anyway, what is important to understand is that – generally – **the distinct links of a productive chain operating in a given territory present distinct capacities, present imbalances, and therefore they present bottlenecks. Support for widening the bottlenecks (or, if you wish, the strengthening of the weakest links) is a priority of collective interest.**

And this is a priority not just for the other links in the same chain. And if this is a impelling chain, the **widening of the bottleneck is a condition for expanding all the activities, including the multiplied (commerce and services provided to families), the G-impelling (which as a general rule, depend on the expansion of the government G-impelling actions (which generally, depend on increasing the government tax collection) and, by extending the basic government services, as education and health care (which are, partially provided by the governments and subjected to fiscal constraints).** And the growth of the service systems associated to activities and multiplied chains and impelling G activities is the basis for the respective transformation of the impelling TrS chains (that supply the non-resident demands in the focus territory).

It is really true that the mere **existence** of chains is not enough to promote the emergence of a consciousness of common interests among their distinct links. On the contrary: at first glance,

the perception of conflicts of interest among suppliers (who seek to increase their prices and profitability) and customers (who seek to keep their costs low and improve the quality of the requested inputs) these tend to overlies the consciousness of strategic unit of interests among distinct links. But – as we teach in the Theory of Games – the recurrence of games and negotiation processes tend to strengthen the consciousness of the prevalence of strategic interests (which are in common) on the conflicts which are immanent to the relations of each link to their suppliers and immediate customers<sup>105</sup>. This trend will be more imposing the greater the consciousness is of the government agents whose inherent particularities and challenges in the interlinked economic systems. These systems are characterized by the inseparability between the cooperation and competition and they are denominated as “coopetitive systems”. A government conscious of the particularities of these systems must work to constitute a governance system of chain(s) focused on facing the bottlenecks and promoting concerted strategies (focused on obtaining optimal balances, in win-win solutions). If this is done, it is practically assured that the necessary elements for overcoming the “Hirschman dilemma”: the chronic difficulty of prioritizing expenditures and investments by the government sector in underdeveloped regions (and nations)<sup>106</sup>.

In order to completely overcome the “Hirschman dilemma”, however, it involves a final step. This step was not overlooked by Goldratt’s analysis. But it was completely developed in a research study at the end of the 1950s which – just like in North’s seminal studies on regional development – which has still not given attributed its just recognition. We are referring to Growth theory in the company, by Edith Penrose (1959). In this study, Penrose seeks to demonstrate that – contrary to the supposed Ricardian common sense (which insists on cross over to Schumpeterianism) – the most successful innovative processes are **not** associated,

neither the technical-scientific revolutions, nor investments in new equipment. The typical Schumpeterian innovation<sup>107</sup> is associated to creative and unusual harnessing of available resources which are found partially idle (or they are used in a sub-optimal manner) in conventional productive systems.

Now, the entire interlinked system has bottlenecks. **And the entire system has bottlenecks, excesses.** The other aspect of a bottleneck is its relative redundancy – in a greater or lesser degree – allocated resources and equipment in the “non-bottlenecks”, in the “wider diameters” of the system. **The innovative process is more effective, more profitability for each unit of expenditure is that which takes advantage of the original economic resources whose mobilization involves “a near zero expenditure”<sup>108</sup>.** And here, we have arrived at the core of the endogenous based regional development program.

Generally, the exogenous followers intend that the outlying regions do not pay for the high costs of investments (in equipment and infrastructure) and innovations (based on costly research studies on basic disruptive technological innovation generators) which would be necessary to promote development in any territory. North seeks to demonstrate that the starting point of regional development does not require large-scale investments, as it can be based on harnessing resources in the territory which are defined as “their own” (or their few) absolute advantage(s). And (despite its evident limitations) this starting point will be efficient as long as the territory achieves a significant portion vertically in the productive chain articulated to the upstream and/or downstream from the original links. Throughout the interlinking process, there will be bottlenecks and redundancies. The actual investments necessary to enlarge the flow of income exert an effect just the same as those by widening bottlenecks. And the regional

income flow – as long as the productive system is controlled by those residing in the territory – it must be enough to finance these indispensable investments.

The growth process of the territory, however, is not constrained to the strengthening of the weak links and widening bottlenecks. The non-bottlenecks are a fundamental part of the process. But the mobilization of redundant resources of **non-bottlenecks** implies great investments. But in fact, it is just the contrary. And they are in the center of the definitive (and effective) process of productive diversification of the territory. And this is because, while diversification is constrained to the interlinking process (vertical integration) it is not suppressed to the requirement of the territory selling a single (or just a few) products<sup>109</sup>.

But diversification by vertical integration is only a natural starting point and the simplest (as it returns to supply a previously established local demand) of the regional productive diversification. The actual diversification exceeds the hyper-specialization that characterizes the initial moments of outlying development which depends on the harnessing of underused resources from non-bottlenecks to supply other external demands. At this moment, the chains evolve to network systems and progress towards productive arrangements and local productive systems of growing complexity. It is worthwhile to say: they are far from being distinct projects (or antagonistic in any way), regional endogenous developments founded on impelling X activities, regional chains, and local productive arrangements are distinct moments in a single process. This relationship is not only self-evident, because countless processes are truncated by the specialization of the territory in impelling X activities of a short chain. And in short chain systems, bottlenecks

do not emerge (capable of articulating the collective effort towards overcoming), neither the emergence of redundant equipment in non-bottlenecks (which are the “natural” basis for horizontal diversification and the constitution of local productive arrangements).

### Identifying Impelling and Reflexive Chains

As we have mentioned in chapter five of this research work, the standard classification system for economic activities is sectorial. We do not have any official information on productive chains. And this is not free-of-charge. In reality, as a general rule, companies are created to supply specific demands. But their technological and productive basis creates new opportunities to supply others and much more diverse demands. In reality, as we have previously seen, the diversification of supply relationships is the basis for the Penrose innovation. And, as such, it is the basis for increasing profits and creating companies. Thus, it is possible to classify companies based on their relationships to customers (it is worthwhile to say: based on their participation in this or that chain), beyond just performing new and costly research (while classification by sector only involves the recovery of data collected from the registration process when filing for company permits), which is a classification marked by transitory statuses. As the innovation and growth of a company implies the growing diversification of ties to clientele and the number of chains in which the company participates in.

The recognition of this fact is the recognition of the inconsistency of the informational bases available in the analysis and planning system of the regional development proposed by us (as well as proposed by North). Fortunately, this inconsistency is

not insurmountable. It is much easier to overcome, as the degree of specialization the focus-territory (the relevant-territory) being analyzed. Why? Because the reclassification of the local productive system based on chains (instead of sectors) goes through a primary research study. It is necessary to interview enterprisers, researchers, consultants, and other analysts of the local productive systems so that we can understand the interlinking network and propose any reclassification (and hierarchization) of the activities due to the relative expression of chains (and, extendedly, by the interlinking links).

But we cannot just put the first research study aside; it is not the starting point for reclassifying activities. In reality, the informational wealth of the Locational quotient (QL) is the size of the secondary data which allows us to constitute well-founded hypotheses on the interlinking system in each territory. The starting point is the calculation of the QL for each activity in the territory. For agribusiness activities, we recommend defining the production volume as the base – or the production gross value (VBP), or the gross added value (VAB) for each product, if there values are available – and the Agribusiness VAB from the territories (as defined in chapter three). For the formal urban activities (specifically capitalistic industry and services) the calculation must be based on the relationship between the employment sector and the overall employment (such as Hildebrand and Mace proposed). For informal services – which are so abundant in the freelance sectors (which range from prostitution to the food supply businesses) – the best information bases are from the Demographic Censuses<sup>110</sup>.

Here, all the activities which present a particularly high QL (over 1.5) are probably from impelling activities. And as we already know, the number of impelling chains in an outlying territory is

constrained. Therefore, it is possible to presuppose that the high QL activity rating is part of just a few (or even the only one) related to the local impelling chain(s). The formulation of the hypotheses begins by identifying the activities which present higher values, in the QLs, as well as in the absolute production<sup>111</sup>. Especially – when considering the prominent role of the primary activities in the initial configuration of the outlying productive specialization – we recommend defining as a starting point the QLs from the agribusiness and mining activities. The QLs from these activities are used as a reference for formulating hypotheses on chains, which are linked to urban activities (especially, industrial activities) from higher QLs. Thus, it is possible to notice that a particularly high QL in the production of soybeans, corn, or rice and a high QL from the industrial activity in “vegetable oil production”, then it is very probable that this latter activity is in an urban link derived from a chain initiated by the grain production in which that territory is specialized in. Likewise, a high QL in the aviculture business and a high QL in the “butchering of small animals and the production of meat products” imposes the hypothesis that these two links are from the same chain. The first research study confirms the hypotheses that, normally, they are formulated based on deductions extracted from secondary information.

In reality the most complex change in reclassifying economic activities from the sectorial pattern to the interlinking pattern is not found in uncovering the interlinking as well as in the identification of autonomous chains. The following example can contribute to clarifying this issue which we wish to focus on.

Let’s imagine that the QL is especially high in a great number of activities connected to transportation: the sale of fuels and automotive vehicle maintenance. How can this information be interpreted? This dedication to transport activities can be (among

so many alternatives) express the following: 1) the final links of the productive change is focused on transportation (such as inputs for civil construction or agribusiness products); 2) the secondary links of the chains are articulated around the impelling TrS activities (such as leisure and/or business tourism); or 3) the central links of a structured chain are directly connected to transport and logistical services, which are characterized by centers without regions which are articulated around large maritime harbors (such as Santos, Paranaguá or Rio Grande, in Mid-Southern Brazil) or the border centers articulating around the highway-railway and customs systems. The identification of the correct hypothesis is far from trivial. Even because, we cannot discard the possibility of the three hypotheses are being valid<sup>112</sup>. The answer to this type of questioning must be analyzed considering the other activities whose QLs are especially high (hostelry points to leisure tourism, dock workers, and custom dispatchers to logistics, production, and maintenance of silos and grain production storage facilities) and the interviews with the local agents. Besides this, it is important to keep alert to the two main principles related to generalities.

Firstly, **if the productive chains are impelling, the final customer is external**. In this case, activities such as transport and logistics can only be defined in the “respective” chain (it is worthwhile to say, they can only be central links, surrounding them as they are articulated around an entire set of activities) if the transported object is not produced in the region. If the transported object is produced in the region, the logistics are just a mere link in the centralized chain by the product which is sold. In a region, that just sells “logistics”, if it contains unmatched logistical equipment and overall demand, such as harbors, multi-module junctions, or international border crossing systems (bridges and customs). And the identification if the territory is equipped (or not) with this kind of equipment is a relatively trivial process.

Secondly, it is necessary to clearly understand the productive diversification of regions is a relatively delayed **result** of successful development processes. In such a way as the data signal a significant diversification and relatively premature (vis-à-vis to the demographic expression and territorial economics) it is quite probable we are over-dimensioning the productive diversity of the territory, identifying, and classifying into distinct links in the chains, which in fact, belong to a single and the same chain. The main mechanism for facing this mistake is by interviewing economic agents who have a broad base knowledge of the territory. But it is worthwhile to follow a supportive rule: when in doubt, do not pass bypass it. The hierarchization of the chains as expressed by their generation of jobs and overall income is just as important in territorial development planning which is preferable to err by omission – thus leaving activities unclassified in ambiguous interlinking – than by intromission – stating the effectiveness of interlinking merely hypothetical and not confirmed by safe evidence and primary research studies.

Finally, this is a very important observation. The null or near zero QL activities in any focus-territory are, generally, exportation activities to other towns/cities in the same reference region<sup>113</sup>. Different from, reflexive activities focused on serving the consumption of residing families that should present a QL nearly the same or slightly less than the unit. However, it is possible that a town/city is subjected to a certain degree of polarization so that some activities which are normally ubiquitous do not emerge in the territory or present a very low QL. This is a typical problem in suburban dormitory cities surrounding metropolitan regions. As a significant portion of workers reside and commute daily to the metropolitan center, a sizable portion of these workers choose to take advantage of

their association to the commercial system of the metropolitan region and make their expenditures away from their residence. This tends to depress not only the economy of the outlying region, but also the government tax money in the town/city and the quality of the basic government services offered to the residents.

In these cases, the local development strategy just promotes reflexive activities, more than by promoting exportation activities. In reality, generally, the primary income of these towns/cities – is income associated to external autonomous demands – which is far from being negligible. It is composed of a great number of salaried workers who live in the territory and who are employed in the central towns/cities. In this case, the main “bottleneck” in the development of the polarized territory is not related to the size of the main income, but in the difficulty of the multiplying it locally. And the development strategy must be focused on facing this bottleneck. Policies for promoting commerce, gastronomy, leisure, and local culture are centralized developmental policies. And their effectiveness can and must be measured by the gradual expansion of the QLs of the reflexive consumption activities.

### **In the Guise of Conclusion: Principles of Territorial Planning**

Since the first section of this chapter, we have sought to recover and systematize the steps during the course of this research study and flag the ramifications necessary for performance. Now, it is necessary to only summarize the presentation of the already announced conclusions.

The required starting point for all and any planning

on territorial economic development is the identification and hierarchization of the impelling chains (or interlocking activities) as applied to the function of actual generation of employment and total income (directly, in centralized activities; and indirectly, in upstream activities and downstream activities in the center of the chain)<sup>114</sup>. Once the most important chains have been identified, the next step is to evaluate the respective diversification capacity. The chains with the largest capacity for diversification are those which tend to integrate vertically in the territory. Usually, the chains with the greatest capacity for vertical integration are those which fundamentally utilize manufactured inputs (as opposed to inputs produced in continuous processes) and non-standardized.

Besides this, it is fundamental to evaluate the expansion potential on the main centers of the chain and the capacity for competitive response from the territory to the expanded demand. If the external demand shows signs of stagnation, or if the growth rate is less than the expansion of the supply in other territories (that present a more competitive profile for producing central goods for the chain), the local economic growth will be negatively impacted. The only way for bypassing the challenges imposed by a stagnated demand and/or by way of the emergence of competitors who have unbeatable competitive edges and through the adoption of diversification policies (and, at most, reconversion) of the local productive capacity.

If the main impelling chains present great potential for the expansion of the demand, supply, and vertical integration, the planning must be focused on identifying the **bottlenecks**. Despite the fact that there is only one narrower bottleneck and despite that is the only one whose expansion can contribute to the increase income flow, the identification of secondary bottlenecks must be carried out immediately. And this is because; the time it takes

to broaden the bottlenecks is diversified. Thereby, if the tightest bottleneck is easily broadened, and the secondary bottlenecks require long-term investments to be overcome, then it is necessary to begin facing simultaneously distinct bottlenecks. Thus, the expansion of the subsequent bottlenecks will follow rapidly in order to overcome the tightest bottleneck. Especially, when the bottlenecks require further investments to be successfully overcome, which must be faced initially a longer time span. The attraction of external investments or the building up of a local system of financing necessary for overcoming the supply bottlenecks by local producers, as a general rule involves time, and they must be treated simultaneously in order to expand the tightest bottlenecks, which are simplest and quickest to overcome.

Simultaneously, it is necessary to give support to the companies that work in non-bottlenecks for the purpose to innovate the utilization of their resources. This step is decisive to achieve horizontal diversification of regional production and overcome the single chain systems for multi-chain systems and networked organization. The innovation pattern of Penrose seeks to maximize the benefits by unit of expenditure based on the correct identification of underused resources or under-optimized form of utilization.

It is necessary to focus on impelling G and TrS activities, besides just the impelling X chains. Now, considering the former, it is essential to guarantee a financing system for government expenses which assign privileges to the surplus portion of taxation on the income of the resident salaried workers. Finally, the impelling power of governmental expenses will be as much as its incidence on the resources which tend to escape from the territory (by way of consumption or investment) and/or saved. Based on the definitions presented in detail in chapter five, this taxation strategy does not

affect the total profits (it only redistributes among enterprisers from distinct ramifications) and enlarges significantly the multiplier of the system. Remember that the impelling TrS activities are even supported by governmental expenses. Finally, the transfers from service demands from non-residents tend to strongly be supportive of one another and one of their bases is exactly, the quality of the basic education and health government services.

In conclusion, it is necessary to pay attention to the relative expression, level of diversification, and the existence of any eventual constraining bottlenecks to expand the reflexive consumption activities. Moreover, the centrality of the impelling activities is based on the fact that they originate from primary income. But the total income of the territory also depends on the respective multiplier. And, many time, the bottleneck does not come from the value of the exportations or the degree of vertical integration in the territory of the central impelling X activities, but in the capacity of the multiplier of the local economy. Support for the local business and the local supply of education, health, culture, and leisure services are not secondary economic tasks. Towns/cities submitted to an especially intense polarization – such as the outlying towns/cities surrounding large metropolitan regions – are found generally to drain income outside and due to the low local multiplier as the main bottleneck to their growth. Facing this bottleneck can be much more relevant to make the local economy more dynamic and attract new enterprises and impelling X chains.

And finally, the diagnostic pattern is, always essentially the same. And from there, all the rest is derived. But the reality, challenges, and the solutions will always be, essentially distinct. The only absolutely universal principle is the Greek principle inscribed on the portico of the Apollo temple in Delphos: “Know thyself”. Once the reality is known and the unique challenges of

each territory, it is easy to find alternative paths and the best way to overcome obstacles and expand the bottlenecks. What this really means is, the only effective overall rule is to avoid the adoption of general projects applied uncritically and without the proper knowledge of the peculiarities of each portion of the territory.

## NOTES

1 See the first chapter of my doctoral thesis for further and more formalized explanation on the “Ricardian” theory of values and prices (Paiva, 2008a).

2 Or the fluctuation in the overall levels of price practiced in commerce, if the international system of payments were based on the gold-standard. Regarding this concept, see the Appendix in chapter 11 – titled as “Further Studies on the Analysis of Comparative Advantages” - in doctoral thesis by Paiva and Cunha, 2008.

3 Or, as this was conventionally named incorrectly as “comparative” advantages. As this was strictly defined as absolute advantages (which are defined as the interregional labor division) regarding the relative advantages (which define the international labor division) exert comparative advantages. It seems that the option for this obscure nomenclature has contributed to changing the focus on the truly revolutionary contribution of Ricardo to an economic theory, thereby stressing as foremost the “common sense” dimension of the model, which only confirms the fact that regions or nations specialize in their most competitive activities.

4 See especially chapter 23 on this subject – The Overall Law of Capitalistic Accumulation – in Book I of The Capital of Marx, and chapter 10 – Industrial Organization: Concentration of Specialized Industries in Specific Localizations – in Book IV on Marshall’s Principles.

5 It is worthwhile to observe that this theoretic conception guides and is referenced to all exogenous programs confronting territorial inequalities. Such programs are based on the concession of government subsidies to attract companies to those regions where – without financial support from the central Government - – there would not be sufficient economic incentives to diversify and broaden its productive matrix. François Perroux is a great theoretical leader on this train of thought. A good summary of this concepts can be found in the writings rescued by Schwartzman in a collection of classical texts on Regional Economy

published by Cedeplar in 1977 (Perroux, 1977).

6 Any semblance of this hypothetical economy to the economy of Rio Grande do Sul as the largest producer of beef jerky and is still the largest wine producer is not a mere coincidence.

7 This means from the Economic point of view, the Euro zone is an indivisible nation, whose first regional subdivision is France, Spain, Germany, Italy, Greece, Portugal, etc. Such a classification does not involve the negation of national autonomy in the political, diplomatic, and military spheres. But just to highlight that relinquishing control of the flow of divisions, goods, and people within that part of the Unified Europe that commune with the same currency (the Euro), thus these “political nations” cease from being “economic nations”; as the division of the labor inside this territory has stopped being defined by relative advantages and started being defined by absolute advantages. This is exactly, the secret of the “jester” concept in the crisis of the less developed regions (Mediterranean and Atlantic countries) in the Unified European Nations at the beginning of the XXI century; goods and services produced in Mediterranean countries before the monetary as their productivity was “less inferior” (which may be expressed as follows: the Mediterranean countries display relative advantages) but this no longer applies. And the result is the deepening of territorial concentration of wealth and income. The most economically developed region in Unified Europe nowadays is Germany and it is most benefitted by this process of the “internal” re-division of labor, as one can see from the high rates of commercial balance increasing commercial balances in European partners since the emergence of the new currency and up to the present moment.

8 In reality, the patrimonialist standards of government planning can be more perverse to economic development than the outlying integration in a competitive system placed on absolute advantages. Whether it be correct or not, this seems to be the support base for the majority of the population in Greece, Spain, Portugal, Ireland, and Italy in support of the Euro: the economic benefits that will be derived from the recuperation of the exchange autonomy are perceived to lower than the costs related to the return to institutional and regulatory standards which

kept tabs on these countries before the Unified European Nations.

9 We have characterized the entire policy to copy the inequality based on the mobilization of external resources to the region as “exogenous”. The standard exogenous policy is the government-company subsidies are used to attract companies seeking to “modernize” their traditional productive matrix in the territory. In these cases, the absence of local productive expertise imposes the importance of different types of knowhow and at least partially affects outside workers. The main determining inefficient factor, in these policies, is when financial resources, new equipment assets, technology, and management come into and/or remains outside of the region, most of the income originating from the activity is also channeled to leave and the subordination condition and dependency of the outlying territory remains unchanged.

10 Through extension, the condition of the outlying development begins by building roads (decreasing the cost of transportation) and attracting institutions and companies to the region, especially, those committed to technical progress. As one can see, the theory of Ricardian development is the main reference in “exogenous” common sense.

11 “Men have the greatest tendency to discover simpler and quicker methods to achieve an objective when their entire attention is concentrated on the objective, then when dispersed by a great variety of elements. As a consequence of labor division, the attention of workers tends to naturally focus on a single objective. Thus, it is natural to expect that some of them when they engage in a specific task find easier and simpler methods to perform it, as long as the nature of the task makes simplification possible” (Smith, 1978, pp. 10 e 11)

12 Schumpeter used to criticize the technocisms attested by the productive processes which are economically efficient, which usually employ relatively simple technologies. “We disdain the happiness achieved artistically in technically perfecting the productive apparatus. We have observed effectively in practical life, the technical element must be subjected when it collides with the economic.” (Schumpeter, 1982, p. 31). Unfortunately, the expressive part of contemporaneous heralds innovation, despite what was intended by the followers of Schumpeter

who are not aware of their critiques on technocisms. In fact, these false disciples just sing in unison to the Ricardian common sense which states that technical progress saves on resources as a necessary requirement (and, to a sufficient limit) in capitalistic development.

13 We have sought to demonstrate the analytical consistency of these conclusions by applying the Smithian formalization system, in Paiva 2004.

14 Schumpeter considers the innovation recommended by Smith for overcoming the “development of the functional loop” and for the identification and achievement of new markets. The classification of the innovations is found in the second chapter of the Economic Development Theory (Schumpeter, 1982, p. 76).

15 The LAEC inflexion in this critical discourse on the agribusiness specialization is not free-of-charge. The methodological standard of the Latin American economic structuralism is the same as the Anglo-Saxon Political Economy.

16 Regarding this, see the notable ninth chapter in the Wealth of Nations, titled “Profits of Capital Reserves”. In this chapter, Smith compares the economies of the Netherlands, England, Scotland, and the emerging United States, seeking to demonstrate that the country with the highest per capita income (the Netherlands) is also the country with the lowest expansion rate, meanwhile, the poorest – the North American colonies – displays the highest profit, interest, and growth rates.

17 It is worthwhile to observe the proximity of the instigating factor in the development perspective considered by comparing the other to characterize the anti-Stalinist Marxism perspective from the first half of the XX century, which was as well expressed by the work of Trotsky focused on the demonstration of unequal character and blended with the development of nations whose transition to capitalism began due to the imperialistic influence. See Trotsky, 1971 regarding this concept.

18 The reference to Smith is explicit in the 1959 study, as well as the association (consistent with Stigler’s, which was equally explicit) based on the

Smithian modeling for imperfect competition and the principle of effective demand. The reference to Ricardo is not explicit for North, but it is evident in its defense that regions can only present (absolute) advantages in few products. The North model association to the post- Keynesianism (as in opposition to Keynesianism in stricto sensu) as this is due to the same two characteristics: 1) the pretension that the multiplier of the autonomous expenses is a function of the income distribution, clearly a Keynesianism inflexion; 2) the pretension that the product and the regional income is an exclusive function of the autonomous expenses and multiplier, does not block any “Ricardian” circumscription (it is worthwhile to say that: from productive, infrastructure, or technological resources).

19 The global supply corresponds to everything produced but is brought in from outside (imported). The global demand is the sum of all the distinct destinations attributed to the offered goods: consumption, investment, exportation, and government management. It is worthwhile to observe that this identity is tautological, placed on that portion of the product which is not in demand by the consumers or other companies, transforming it into an investment in inventory (but not yet undesirable) they are classified as the company’s own demand. The products cannot be stocked (such as agricultural produce, for example) identified as demand = supply by the increasing and decreasing price fluctuation. So this goes beyond this related tautology considering a specific theoretical perspective. For the Keynesians, the supply adapts to the demand. For the Say Law defenders, the supply creates the demand (which fits the first case).

20 It is worthwhile to remember that exportations refer to and considers all the sales outside the territory. In the case of a region – it is understood as part of a nation – the majority of “exportations” will be shipped to other regions in the same country.

21 Consistent with the consecrated tradition, we have adopted the first letter of the English expressions to symbolize the economic categories: Y for income, I for investment as to differentiate from income, symbolized by I, P for profits, salaries or wages as W, and T for taxes. It is worthwhile to observe in the Keynesian model, interest, incomes, and rents are part of the total gross profits (considered in the

majority of investments appropriating one's own capital resources), which makes explicitation unnecessary. So, we maintain this hypothesis as doing away with it would make the model more complex and not provide any gain in understanding the definition of the income process.

22 This Keynesian hypothesis was critically expanded based on empirical evidences which demonstrate the ability of workers who earn wages to save and invest in countries with a high per capita income. From our point of view, this type of critic is essentially wrong. The Kalecki model does not such presuppose the impossibility of saving reserves by the individual worker. It only states that the ability to save by some people corresponds to others losing their savings, whether they are young people who are just entering the market and have gotten into debt to purchase their (first) property, or elder people and retired people, who have lost their savings as their expenses exceed their retirement pensions. So for Kalecki, as the working class cannot save and if they did save reserves and re-appropriate the production means which they have been excluded as the capitalistic order has developed. And the system itself must be put into check.

23 In the Kalecki concept, distributed stability is associated to the stability of the competitive patterns in specific markets, and by extension, to the stability of the amount of monopoly in distinct companies which are active in distinct markets. In the North concept (as well as in the Keynes) this hypothesis does not apply as the object of theoretical determination.

24 In conclusion,  $Y_d = X + C_w = P + W$ ; if  $C_w = W$ , then  $P = X$ . This formally approximates the North system of the LAEC agro-exporter model, systematized by Furtado in his analysis of the capitalistic coffee economy in the Brazilian Economic Formation. But, contrary to people who are quick to criticize, the fact is the North model is referred to as a regional economy changes its essential contents.

25 As stated in the North concept: "As the income distribution becomes more equitable, then the demand for a large variety of goods and services grows, part of which is produced internally, induced by a diversification of investments. There will be a trend to develop commercial centers to supply a great variety of services, in contrast to the "extensive" type economy, which simply develops in

few urban areas dedicated to the exportation of regional staples and the distribution of importations". (North, 1959, p. 337.) Any semblance to the Southern half and the Northern half of the state Rio Grande do Sul is not a mere coincidence.

26 Or, alternatively, the more democratic the possession of the land is and, by extension, the more income the farmers allocate in the purchase of local consumption goods, as compared to the purchase of capitalistic goods produced and consumed by "external" economic centers.

27 Regarding this, see North, 1959, pp. 337 and 338.

28 This does not mean that the threshold limit of the  $\beta$  parameter will be 1. If we consider the exported product/s as the "central link" of any given productive chain,  $\beta$  can then exceed the unit of measurement, so that it/they will be incorporated into new links for the downstream processors in the basic impelling activity. A region that produces and processes wood as its main impelling activity, and even develops a secondary activity of wooden lamination and furniture can be considered as a region that exports distinct products, or alternatively, as a region that exports a single product (wood) but portrays an elevated  $\beta$  parameter and eventually (one that depends on the integration level of the input production), superior to that unit.

29 Following the Smith concepts and the scholars on the occupation of the North American western region (especially, Isard, 1942) North understands that the integration of the recently occupied regions usually (and despite exceptions) due to the mobilization of the agribusiness production. Regarding this subject, see specifically, North, 1959.

30 In order for a cigarette and other related tobacco products to burn and the smoke to be inhaled, it is necessary to "fill it with air". Thus, a container of compressed tobacco is transformed into various containers of cigarettes.

31 Contrary to the workers' consumption that depends on the salary, which in turn depends on hiring of workers, and then in turn, it depends on an autonomous demand, which is the basis of profit.

32 The particularities of the treatment by Petty is found in the emphasis

placed on this theme, but this was also recognized by countless philosophers, historians, geographers, biologists, economists, and statisticians from the distant past who imposed spatial clippings in their analyses on reality. For this reason, it is not surprising that recurring statements among contemporary analysts who have ignored the value or underestimate their influence from classic Social Sciences in the results of their studies. It is really true that this influence has been more recognized and more engrained contemporaneously. But there are those who consider this as a novelty and only display their ignorance of the classic literature in Social Sciences.

33 The main problem of distributive abnormality is that the significance tests usually imposed on the sample inference assumes that the distribution is normal or near normal. If the distributions are abnormal and the distributive pattern unstable, the fact of abiding by the significance tests defined for normal distributions loses the strictness and becomes insufficient for acceptance of the hypothesis. There are specific tests for abnormal distributions. But, as a rule, they add elevated costs to research related to sampling and reliability. Due to this, the most widespread strategy for coping with the problem represented by the extremely heterogeneous territorial units is the very favored statistics relativized per capita or the area. This strategy represses scattering and the occurrences of outliers, but imposes new analytical difficulties on dodging the expressive differences in the size of the units being analyzed. See the following extremely simple example to help you understand the concept. If we are informed that the GNP of a city is 15 billion Reais (Brazilian currency) and the other is 5 million Reais, then the asymmetry of both cities is clearly understood. But, if we are informed that the GNP per capita of the first city is 4 thousand Reais and the second one is 2 thousand, then the average GNP per capita of the cities is 3 thousand Reais, then we can conclude that the average is equivalent (or almost) to the GNP per capita of the population. But this is not the case. As the population of the city with the larger GNP is also larger, the average income of the entire population is R\$ 3,998.67, then it is worthwhile to say, practically equal to the GNP per capita of the larger city. The basic problem is that we are dealing with units which are only formally equivalent – the cities -, but qualitatively distinct – metropolis X small suburban

agglomerates. This problem, which is manifested in the typical bimodality of the distribution of the municipal populations reveals the formal equivalence (for all the cities), despite the differences in the “content” among metropolises and rural towns. A metropolis is a region (even if it is composed of a single city) and in countless situations, it faces other regions (a group of towns and cities) so if we wish to provide effective homogeneity to the units which make up the population (and/or the sample) being analyzed. See Paiva and Tartaruga regarding this topic, 2007.

34 As a result, this produced an extensive and compelling bibliography classifying the regionalization interference patterns on distinct statistics. It is worthwhile to state that due to its contemporaneity, most of this literature is available on the internet.

35 Regarding this classification, see Ávila and Monastério (2006).

36 This term was not created in Spatial Statistics, but in biology and it is applied a great deal in medical research. It is possible to say that a statistical result suffers from ecological fallacy when the sample is applied to and collected from the wrong population, and considered in the wrong way. See this extreme example as it can be useful: for example, a medication is effective in 48% of the population in combating against a given disease and a wrong statement is made and thereby hides the fact that the medication is 100% effective in men and 0% in women.

37 This example can help in understanding this issue. A few years ago, there was a study on the living conditions in the population of cities in Rio Grande do Sul State, which concluded that Alvorada was the city with the lowest number of hospital bed per inhabitant and proposed facing the problem by building a municipal hospital. This study did not consider the fact that the largest hospital complex in the state – the “Grupo Hospitalar Conceição” (Conception Hospital Group) – was established in Porto Alegre, but is just a few meters away from the Alvorada town border and this hospital provides good care to the previously mentioned population. The mistake in this study was that it ignored the fact that Alvorada was not part of the Metropolitan Region, but it is practically one of the city’s neighborhoods (even though, it is politically independent) from Porto

Alegre.

38 Andrea Muñoz (2007) in her Master's thesis study recaptures the history of this inflexion in the State of Rio Grande do Sul. This was the apex of the "technocratic regionalization" project on the Government and the publishing of the Proposition of Government territorial organization for the purposes of regional and urban planning" (RS, 1974) by the State Secretariat of Public Works and Development. The main theoretical reference for this regionalization project is from the French school of Economy led by François Perroux, for which the development is imposed beginning in the "Growing Centers". Especially, in the "Proposition" in 1974 and it is modeled after the "Region Plan" by Jacques Boudeville (an accurate summary of the theses of these authors is found in Breitbach, 1988). This was amply debated in the second half of the 1970s, the "Proposition" was rejected politically; mostly by being placed over a hierarchal group of cities questioned by political leaders linked to agribusiness and/or regions that marked a more diffused urban system (networks of small cities and towns). During the course of the 1980s – in the bulging scenario of re-democratization in the country – the debate on this theme was being increasingly hegemonized by the critiques of the technocratic regionalization and territorial rights to become "self-organized". There was a complete victory of the anti-technocratic perspective (and the "Basista" and democratic bias) and in 1994, the Regional Councils of Development were institutionalized whose regionalism was defined fundamentally by the geographic distribution of the former Municipal Associations of Rio Grande do Sul State. These, which were created based on the interests and municipal political alliances, without any theoretic basis or evaluation of their consistency to the necessities of the state government planning and administration. Since its creation and even nowadays the critiques are constant from the "Coredes" leaders on the disrespectful treatment from distinct state governments to this institution. Based on our point of view, these leaders must ask themselves how much of this disrespectful treatment is caused by the dysfunctionality of a government planning service institution which does not accept any interference from the Government and not even the definition of the number of Councils (which has increased systematically as the years has gone by) or throughout the territories being controlled.

39 This is an eminently rural region; even though the urban population of Santa Cruz do Sul is around 150 thousand. If Eli da Veiga would have recovered the size of the measured reading from North, he could wield much more solid arguments than "Brazil is less urban than we calculate it to be" (Veiga, 2003). It is worthwhile to observe, after all, the dynamic solidarity of Santa Cruz do Sul linked to Agudo, Vera Cruz or Sobradinho do not exclude contradictory interests. There are forms of economic solidarity that involve satellization or even, exploitation. But, this does not deny the regional unit, as the dynamic (antagonistic) party which can only be understood based on the defined relationship between each one of these.

40 Through this, the articulated centers based on distinct border equipment (ports, customs, etc.) as well as political-administrative national centers or federated states, and tourist centers with national or international attraction, these are "centers without any region". For those who are interested in furthering this theme, we recommend reading two of our studies published a few years ago: 1) the article published in the "Revista Indicadores" (Indicator Magazine) in 2009, titled as: "Rural and urban regions in the regionalization process considering territorial development planning and analysis" (Paiva, 2009); and 2) the chapter of the book Three decades of the Gaucho Economy, titled as: "Seeking a more compatible regional division with multiple needs of research and planning" (Paiva et al., 2010). Both are available for free downloading in internet.

41 Regarding this category, see the first section of this chapter. The discussions on families and homes as "indivisible artificial units", they are actual cells where the standard of living is defined and class insertion of its members. For this, the social stratification analysis and income distribution of a territory cannot be based on isolated individuals, but on data grouped for families (or homes).

42 On the contrary, the Catholic Latin and Cartesian ideas are based on learning is the result of thinking, from speculating. This theoretic tradition is widely disseminated in the European Mediterranean countries. But, this applies more intensely in Latin America, whose enslaved past made the links in the chain between work and intelligence invisible.

43 This is not always the case. As we have already referred to the “centers without region” whose dynamics are defined preferentially by its relationship to the national territory (or at least, a must vaster territory than just its own surroundings). But these cases are exceptions. Usually, the economy of a town is deeply associated to its surroundings; and it is necessary to define the relevant surroundings.

44 It is possible to be smaller when the aggregated focus-region in areas with productive specializations and very distinct economic dynamics. Usually in cases of bad specifications of economic regions, the revision of the regional division must include the exclusion of towns (or groups of towns/cities), as well as the incorporation of others which were not included in the initial regionalization. A good example of a badly specified region is the town of Corede Vale do Rio Pardo in Rio Grande do Sul State. The towns are located south of the Jacuí River (in the central southern region), which display land, edaphoclimatic, and very distinct productive specialization patterns different from the towns in the northern section. See Paiva and Ramos regarding this subject, 2005.

45 Unless, there are relatively rare situations, where the town/city is endowed with a very peculiar set of qualities as: (port, customs, and tourist attractions of national or international appeal), which turns it into a typical center without any region.

46 These regions are quite often considered, uncritically, as a reference. But, this is a serious mistake. Although it is considered, in Brazil, as a technically qualified institution as defined in the national system of regional divisions (the IBGE: the Brazilian Geographical and Statistics Institute) whereas statistics on territories are provided, an attempt to attribute a regional division in a universal manner ends up attributing an elevated cost: the proposal of regionalization which does not plainly contemplate any function or criterion. Besides that, the regionalization of the IBGE is subordinate to some institutional regionalizations defined by State-based scopes, such as, for example, Metropolitan Regions. And as the area of this last mentioned statement is defined based on the scope of the state Legislative Assemblies to solve disputes and political-electoral interests, all

the “scientific” regionalization of the States suffers a negative impact. For example: the Metropolitan Region of Porto Alegre (RMPA) incorporates Novo Hamburgo, which is the shoe-making center in the Vale do Sinos; but it does not incorporate a set of towns north of Novo Hamburgo which are economically polarized by the former (Novo Hamburgo). Simultaneously, RMPA is so large that it is not appropriate for referencing dynamic analysis related to any other city/town in the outlying regions. The Gravataí development planning – an industrial city located in the northeastern section of RMPA – is very unrelated to the dynamics, the growth potential and obstacles to the development of the towns of Triunfo, Charqueadas, Arroio dos Ratos, or São Jerônimo, located on the southeast border of RMPA and they present a distinct market productive profile. And the state regionalizations do not follow the IBGE standard IBGE and therefore do not achieve their best results. Such as in the case of the Coredes gauchos which was previously mentioned (see note 38, in chapter three), the majority of the state regional divisions were defined at the end of the last century, during the bulging technocratic project of regionalization, and are not based on any systematic criteria, such as geophysics, edaphoclimatic, or economical.

47 We can characterize this investigation strategy as an “onion strategy”, in order to remind us that there are various layers surrounding the core (focus-territory), beginning with the nearest and most similar, until we get to the outside, furthest, and most differentiated (similar to an onion skin).

48 Anyone who is interested in following up on how this strategy applies can recover the data collected by the author from his consultancies in the towns of Rio Grande do Sul considering the preparation of Strategic Development Plans. We recommend, especially his work performed in Bagé, Uruguaiiana, Gravataí and Rio Grande. These results are available at <http://www.territoriopaiva.com/ctms/3/40/consultorias>.

49 It is also possible to apply sub-regionalization to a focus-region based on homogeneity and polarization criteria. This is the main topic of two of the studies I wrote and they are, referred to at (Paiva, 2009; and Paiva et al., 2010). Anyone who is interested in further details on this subject, we recommend you

to read these studies, which are free to download on the Economy and Statistic Foundation webpage.

50 Lastly, the demographic evolution generates a very valuable involuntary sub-product: the identification of the “statistically comparable areas”, based on the possibility of performing an adequate demographic performance evaluation on a territory without confusing population loss due to emigration to have a loss in population by losing part of the territory in the bulge of the emancipation processes in areas and in the installation of new towns/cities. The IBGE (Brazilian statistics bureau) as well as the Applied Economic Research Institute Foundation (IPEA) provide information on the long term demographic evolution in towns/cities and the evolution of their areas. The simplicity of the recomposition of dismembered territories is maximized when working on demographic data, as long as the partitioning does not affect the product value (which cannot be asserted in the case of an economic product; especially, in the case of fiscal administration and the production of a government sector). And, thus, is how demographic analysis by analysts makes them aware of the existence of a peculiar scale in the “relevant-territory”: the territory of a set of towns/cities which originated from the same “mother-city”.

51 But it is necessary to flee from the temptation to define the relevant-territory only by comparison of performances. As it has already been observed, the dynamic unit between the center and the outlying areas on a given relevant-territory does not guarantee that the parts present similar performance. There are dynamic units, in which the centers move perversely from their outlying areas, absorbing their potential growth.

52 As opposed to North who, respectively, preserves the Locational Quotient to the defined indicator by employing and even proposing a nomenclature for his own indicator, then, we prefer to consider both of the distinct forms of measurements of the Locational Quotients. Due to this, we relinquish to subscribe the difference between the LQs (LQH-M X LLN). We believe that the context is enough to sufficiently clarify the distinctions the calculations in underlie the same objective: define the exportation products.

53 The historicity of the classification system for activities can be exemplified by overcoming and abandoning a class of current activities in countless national economic classification systems during the course of the XIX century and it was losing ground beginning in the first years of the XX century: the “production of soaps and candles”. After electric lighting was introduced (a new category was included: electric materials and equipment production) and after the personal hygiene products multiplied and the growing complexity of chemical processes associated to their production, the activity of “production of soaps and candles” became less important, continually, the economic activity expression became extinct and was dismembered. Although candles and soaps are still produced, the modifications in the productive system and consumption imposed the dismembering of activities included in this sector, which were then allocated to totally distinct classes.

54 It does not make sense for Iceland include a national system for the activity of “cocoa production and other products from permanent tropical crops”. Likewise, it does not make sense for Ghana to include a national system for the activity of “unmanned aircraft production and spacecraft”.

55 Further information can be obtained from <http://conclia.ibge.gov.br>

56 It is very true that not all statistics and information are exactly available from the same database or even the same level of aggregation. In reality, the Fiscal CNAE presents some specifications, differentiating the classification standard of companies based on their sizes and fiscal exactness standard which they are submitted to. Besides that, the expansion of the list of activities in the CNAE 2.0 was not incorporated for all statistics production entities simultaneously, thereby making comparison more difficult. Finally, there are distinct institutions that present information at distinct levels of aggregation (the CNAE for fiscal purposes (2.1) disaggregates even the level of the sub-groups). Notwithstanding, there are different topics, the systems are essentially compatible or can be made compatible with minimal work.

57 As it already has been observed, the agribusiness activities are performed in open surroundings (rural) and all the work process is submitted to climatic and

seasonal factors; which imposes constraints on the continuity and repetition of tasks and jobs, as time goes on and, due to this, limits on specialization and technical division will arise.

58 Except for the civil construction industry and those involved in Industrial Services of Government Utilities, whose distribution network is local (water supply, sewage system, and sanitation, garbage collection, etc.). However not free-of-charge, these activity sectors are on the “border” between industry and services. In like manner, the Mining Industry is the first Industrial division in general, as it is closest to the agribusiness sector, in the way it depends on nature.

59 We will see in the next section, how generally this is full of exceptions, when considering the importance of diverse forms of “tourism”: leisure tourism, business tourism, specialized service tourism, etc..

60 Regarding this, see Leontief, 1983.

61 Any resemblance to the previously cited Vale dos Sinos, in Rio Grande do Sul, is not a mere coincidence.

62 Prostitution is an informal activity and, in Brazil, its QL cannot be calculated based on the information on the RAIS system (Annual Rating of Social Information), from the Work and Employment Ministry (<http://portal.mte.gov.br/rais/principais-resultados.htm>). But the QL from this activity can be calculated based on the information from the Decennial Demographic Censuses, in Brazil. It is worthwhile to observe – based on the anathema social of selling intimacy – the number of those who report activity this is much lower than the number of those who are effectively linked to commercial sex. However, considering the universality of (auto)critic, it is the oldest profession in the world, this underestimation tends to distribute relatively homogeneous in the location. Therefore, central cities display higher QLs in the presented activity, so as a general rule, greater specialization in that activity. And as this specialization unfolds into countless social ramifications (as the proliferation of venereal diseases based on the extend of the informal economy, which does not generate taxes for the public health system), it is especially important to recover the QL from this activity in the

diagnosis of the social economic structure in any territory and, especially in centers without any region.

63 A harbor city is a type of center without region, based on the definition for this term here, as its reproduction is not based on the surroundings, but on the entire national territory or even worldwide. But this feature does not imply the affirmation that the relevant-territory is reduced to just the harbor city. In reality, where there is a harbor, usually there are other tourist services related to the seaside (or waterway) which is situated in the nearby surroundings. In case, the city has undergone dismemberment and the equipment connected to the harbor is located outside the focal headquarters, the relevant territory will be composed by the immediate surrounding towns and areas.

64 There are diverse ways to define the origin of users in the service system in a central city. Generally, the service providers have a good understanding of the origin of the user. In some cases, there are records of their origin (such as the data in the Brazil Public Health Care System) DATASUS, who provide free access to researchers). Another mechanism is the comparison of the distances of roadways and transport lines between surrounding towns and the focus-territory and “alternative centers” instead of the main center (which are capable of supplying an array of similar services). Let’s assume that the user is rational, he/she must save on transportation costs in order to access similar services. We cannot list all the tools, as they depend on the available information database, and this varies to a great extent. But, we cannot forget to mention two extreme sources of data: 1) structured interviews with agents who are bearers of privileged information; and 2) random sample research data from the service system users.

65 An example can help you to understand this subject better. As Santa Cruz do Sul became one of the largest tobacco processing regions active in Rio Grande do Sul, this town receives tobacco from the furthest regions in the State. But many of the tobacco growing towns are nearer to other central cities for serving the demands of generic services for their residences. This is the case, for example, Agudo (near Santa Maria) and Camaquá (near the Porto Alegre Metropolitan Region).

66 The analysis on regional development potential and restraints is based on the features of the activities/impelling chains, which will be the debate subject in the next chapter.

67 In reality, all cities/towns receive an amount significantly higher of public services/resources as compared to their tax collection. This is the case of all the capital cities in the Federation Units. Our option by not exemplifying the capital cities is due to the recognition that, usually, it constitutes a metropolitan region surrounding itself, which makes it unfeasible to use them as an example for a specific “type” of center. Santa Maria is the best example, as it serves no other functions than being a “diffused center”.

68 Especially in a country, such as Brazil, where the occupation of the “west” has still not ceased, the political pressures of the emerging regions focus on the deconcentration of governmental expenses. Diffused centers have been consolidated, which present great dependency on federal funding, tend to present less dynamism than the national average. In the case of Santa Maria, the situation is even more troubling as the “defusing surroundings” which supplies demands for their services – the Southern Half and part of the Middle Eastern part of the State – have displayed less economic dynamism than the northeastern section of the state, where there are alternative centers, such as Porto Alegre and Caxias do Sul.

69 Let’s return to this subject later on. But for now, it is enough to understand the development of the outlying towns which is not only due to the diversification of their exportation activities, but also this is associated to the diversification of their activities focused on supplying the demand of the local population. Through this, part of the income is channeled to the centers; some of it remains and it is multiplied in the town.

70 The program can be obtained free-of-charge from the INPE site at the following address <http://www.dpi.inpe.br/terraview/index.php> . It is worthwhile to observe that (up to version 4.0 of the program) the variables introduced in Skater must be previously standardized by the researcher; if not, the regionalization will be biased because the variables are greater than the absolutes.

71 The sectorial standard for classification of the activities is jointly responsible for the so generalized acceptance, as well as the uncritical nature of the programs in facing regional inequalities based on subsidies for the installation of “Growth Centers” in the outlying regions. And this occurs due to the criticism of common sense in the “traditional” industrial activities and the defense of the “innovators and intensives in technology” activities is based on recovering the characteristics of the central link in the productive chain. When we abandon the sectorial system for the interlinking system of classification, the following fact becomes evident: 1) even the more “traditional” industries count on intensive links to technology (such as the production of machines and components for the sector); and 2) the strategies for attracting “modern” companies do not guarantee, neither the vertical integration in the chain in the territory, nor the conservation and multiplication of the added value in the inner state region itself.

72 For a quick and especially didactic presentation of the Balance of Payments, Commercial, Services, Incomes, and Capital, see Horn, 2012.

73 The “permanent tourism” category is contradictory. But this is a true contradiction (dialectic). And this is the option of residents who are subject to survive as rentiers and do not have any professional links to the territory, and their status can change at any moment. Keeping this type of tourist in the territory is not an easy task. After all, this tourist also can choose to be a chronic traveler and spend his/her resources in distinct territories throughout the year. On the one hand, the influx and preservation of “permanent tourists” is an especially auspicious source of regional development. This source of resources is not free and has become internationally disputed, such as Florida (USA), Bali (Indonesia), the Aegean islands (Greece), Andalusia (Spain), etc. Permanent tourism presents countless advantages for the territory, among some of these are: 1) it stabilizes the income of a tourist territory and does away from the typical seasonality of leisure tourism; 2) it provides high-level synergy to the other forms of tourism (especially the commerce and health services); and 3) it is a great mobilize on the local level of employment; as the typical demands of retired people (as senior citizens whose needs for durable goods are essentially met) in such services as health, security,

transport, and gastronomy, etc. And the migrant retiree does not compete with the residents in the job market or for market niches. He/she generates pure demand (it is worthwhile to say: unaccompanied by any supply) that returns to highly profitable services which employ a great number of employees.

74 When we think about central cities, such as large “purchasing and service centers”. Thus, the same way a Shopping Mall offers diversified products so that it is attractive to children, young people, and the elderly of both sexes, the attractive power of a central city is based on the rate of diversification, this defines the attractiveness as a “tourist” attraction.

75 In Brazil – as most capitalistic countries are with its Legislative systems and autonomous Judicial system and capable of controlling the Executive – there are strict limits for governmental expenses without taxation coverage. Through this, there are large mismatches in tax collection and expenditures in the associated regions, so as a general rule, to the federal government.

76 Trygve Haavelmo demonstrated the positive impact of governmental expenditures on the income in balanced budgeted conditions in a study published in the *Econometrica* magazine in 1945 (Haavelmo, 1945). He was awarded an Economic Nobel Prize in 1989 largely based on this statement, published in the *Econometrica* magazine in 1945 (Haavelmo, 1945).

77 Whereas  $Y_d$  is available income,  $C_w$  is the consumption from workers;  $C_k$ , the consumption from enterprisers-capitalists;  $I$ , the investment;  $X$ , exportations;  $M$ , importations;  $P$ , profits;  $W$ , total wages / salaries;  $w$ , the percentage of the share in the total income from salaries. For the reader who is familiar with Social Accounting, we are not going to repeat here, the detailed presentation of the national accounts (or regional) in the standard as adopted by Kalecki, which was the subject of our presentation in the second chapter. For the non-economist readers, we recommend rereading the text on the model on income definitions in chapter two whereas the categories are presented in a systematic manner.

78 The results of this system are not affected by the case adopted in the hypothesis based on the government workers who pay taxes or not. If they pay,

the government sector will have a larger income and contract more workers (as the surplus was negated by the hypothesis), which will consume the same amount and impose the same stimulus on the production of consumer goods for workers (when not considering any savings) which would happen by government workers who are exempt from paying taxes.

79 The multiplier corresponds to “ $1 / (1 - w)$ ”, whereas  $w$  is the share of salaries in the income. If  $w = 0.5$ , the multiplier is equal to 2. If  $w$  exceeds 0.6, the multiplier is increased to 2.5.

80 The successful operation of this model assumes the presence of unemployed professionals or under occupied and idle skills in industry. The basis for this hypothesis is found in Kalecki ([1937], 1990).

81 However, generally, whoever uses a local publishing tool is a producer whose market is local or regional. This is related to essentially multiplier activities or TrS Impelling activities.

82 In these cases, we recommend adopting the QL as a reference for the distribution of employment and reflexive and impelling incomes. For example: if a town or city is three times more specialized (QL = 3) than a region whose standard activities are in outside residence food services, such as (bars, restaurants, etc.), it is recommended to characterize one-third of the employment and income as “C reflexive” (as this is the employment that guarantees an QL equal to the unit) and two-thirds as “TrS Impelling”.

83 The classic expression for the national income is “ $Y = C + I + G + (X - M)$ ” which is not correct even for the country. But it is acceptable when we focus on the global economy and the imperial economy of a country (as the United Kingdom) or an imperial-continent (as the USA). In this case, we place the relationships to foreign “between parentheses”. If the focus is on the world, then the commerce is internal. Then, there is neither exportation nor importation. But this abstraction is completely wrong, when the focus is on the outlying regions in general. Whether it is national or regional; it is even more incorrect in the latter case. As the relations with outside the regional outlying areas (due to the integration condition is hyper-

specialized) they are the only connection to the rest of the world. And the only strictly truthful assertive apologists of the globalized communicational revolution are that the world currently moves and changes so fast. It is necessary to be connected, so one does not lag behind; in all imaginable ways and means.

84 This is a general rule, as those territories which produce capital equipment and are not input by their own main exporter chains, and are produced for the purpose of exportation. An example can be useful, the city of Caxias do Sul is one of the most industrialized cities in the State of Rio Grande do Sul and it has and great range of capital goods. But this sector is concentrated in the transport material segment, especially for buses and trucks, whose fundamental demand is “external”; it is worthwhile to say, they are produced for the purpose of sales outside the territory. On the other hand, when the bus and truck producing firms in Caxias make investments in fixed capital, they import equipment that is necessary for their expansion, as the city does not produce machine tools for the metal mechanical industry. The investments in the firms in Caxias cause an increased demand for machine-tools produced “externally” (whether it is in São Paulo or from another country). This way the income growth and estimated employment in Caxias are not invested in Caxias, but externally. Such as any region, the growth in the income in Caxias depends on the expansion of its exportations (to other regions) of the transport equipment produced internally.

85 It is worthwhile to remember that the government is involved in this equation only by its impact in the available income, by way of payments to workers. The free services from the government to the society are not considered when we evaluate the available income as the reference.

86 That is identical to the Gross Internal Income, or the RBI.

87 In the case of Rio Grande do Sul, the extreme cases are Triunfo and Santa Maria. The GNP (means the Gross National Product – RIB – and this is the available internal income - Yid) which is very high, due to the added value from the Petrochemical Center. But the regional income corresponds to at least 5% of the GNP, as the largest portion of the added value is not taxable, transfer of profits and transfer of salaries (most of the workers in this center do not even live in

Triunfo, but in other cities and towns in the Metropolitan Region of Porto Alegre). On the other hand, the available regional income in Santa Maria is significantly higher than its GNP, as a large portion of its residents are rural producers whose properties and sources of resources are found in the surrounding towns. It is worthwhile to say that the SBRTU of Triunfo is strongly negative, while the SBRTU of Santa Maria is positive. See Paiva for further information on this, 2008.

88 As opposed to taxation exclusive from workers, whose perverse results were treated in the last section.

89 Finally, even when the resident enterpriser in an outlying region purchases the durable and semi-durable consumer goods (as cars, appliances, clothing, etc.) and sophisticated services (medical-hospital care, education, etc.) externally, the use of these goods implies expenses (even if relatively small) in the region, such as fuel, electric power, telephone, etc.

90 The difference is that the GNP (RIB) is made available yearly at the city level, but the annual information on the available regional income is calculated based on the PNAD, which is only representative on the State-wide and Metropolitan Regions. This information is only available every ten years on the city Yrd, based on the Demographic Censuses.

91 Or at the best of hypotheses, pay for the extremely high costs of transport (as the containers are shipped full and return empty) and use the services, inputs, and the quality of the products is lower than the national standard, which causes serious consequences on the competitiveness of the economy in the long run.

92 From the type of grape □ wine □ barrel □ furniture. The secondary link is the barrel and the autonomized chain is the wooden furniture.

93 Based on this, we are not proposing any professionalizing inflection and non-universalist for the elementary education. We are only rescuing the necessity to integrate the scholastic curriculum in the lives of the students and the community. Thus it is – for example – lessons on health, sewage, intoxication, proliferation of bacteria and microorganisms must be considered as a reference for the productive system of each territory. In a region specialized in dairy

product production or livestock, then the examples (and the experiences) can be and must be distinct from those available in territories specialized in grain or leather processing. This pragmatic dimension of education is covered so much in the Anglo-Saxon economic literature; however it is usually underestimated in the continental European literature (especially, the literature that expresses the growth centers and strictly technological innovations).

94 It is worthwhile to remember that the primary regional income is the income determined by an autonomous demand as expressed in the Keynesian and Kaleckian manner. The consumption of the non-resident workers is not autonomous, as it depends on previous income. The autonomous demands which focus on any territory are those which are independent from the income of the residents. These demands are: 1) the capitalistic demands of consumption and investment (which is backed by the equity of the requestors, and not their income); 2) the demands of the governments in general and the central government specifically (as this instance with the greatest freedom to incur deficits, take out loans, and change the standard and the fiscal policy); and 3) the external demands, defined by the income and/or equity and/or government expenditures of non-residents.

95 Even if this local production is necessarily partial, as some inputs and necessary equipment are, unless they are imported from outside any regional economy, they are regionally integrated externally.

96 This is the problem of Smith, which was mentioned in the second chapter. A small manufacturer of pins is capable of producing thousands of pins each day. If there is only a local demand for so much production, its installation is estimated. If not, the producers will have to look for customers outside the territory and pay for the transport costs and advertisements.

97 The logistic systems are like “double-edged swords” to the regions. They facilitate the insertion of the outlying regions to the external market; but also they expose the local production to external competition. This is how North considered this: “The initial development of transport facilities for the purpose of implementing the exportation industry tends to reinforce the dependency related

to it and inhibit, in several manners, the more diversified economic activities. Premature development in transport commonly brings about (competitive conditions), a rapid decrease in transport charges and consequently, increase the comparative advantage of the exportation product. But even more, in recent colonized regions transportation is in only one direction. Maritime shipping of bulky products leaving the region has no counterpart cargo coming into the region, and the vessels have to return completely empty or just with ballast. Consequently, the return shipments are very few and reinforce the competitive position of importations as related to the internally produced goods. As a result, a majority of the local industry, which has been protected by the high costs of transport, or it would be able to develop if the situation remained in such a way as to be capable of facing the importation competition effectively.” (North, 1959, pp.338/9) According to North, throughout the XIX century industrialization in the cotton-growing region in the southern part of the United States was not only hindered by slavery and by the landlordism, but also it suffered from the consequences of an especially imbalanced transport system, as the volume of the exported merchandise (in natura cotton) was so large that it stimulated the importation of any product from the external market, including even those which were considered as insignificant when considering the volume unit (such as tiles and bricks) which were imported due to the purpose of using it as ballast on the merchant fleet on their return voyages to England and the northern part of the USA.

98 Regarding this, see the first chapter of Tavares (1981). It is exactly by admitting that the path of productive diversification causes the lowest cost per unit of benefit. The Cepalins believed that only the Government could afford to invest in order “to face the demand”. And justified the need for this investment standard by forecasting increasing barriers in the importation by Latin American countries due to the mismatch between the value of exported goods by the outlying regions (agribusiness raw products and mined ores) and the value of goods necessary to increase the reproduction of an industry in the expansion process and gradual diversification as the substitution process continued. Despite what the “exogenous regionalists” intend, the main justification expressed by Cepal was the need for government investment at a national level (the growing restraint on borders) is

not pertinent for justifying government investments “to face the demand” on a regional level.

99 We have already requested the need for financing in order to carry out research and production on research work focused on theoretical systematization: 1) the Diversification Principle by Interlinking; 2) the evaluation technique of interlinking investment opportunities in economic regions centered around distinct specializations X impellers; and 3) hierarchization of investment alternatives based on the respective profitability/prospective risk. This project is being negotiated at distinct fomenting research agencies and, if they are approved, they will be developed and publish the results next year (2014)

100 The specific nature of transport and the storage of agricultural equipment parts is that they display extremely high mass/value and volume/value relationships. This relationship is even higher in assembled equipment, which presents high risks of damages and losses during the transport and storage process and a limited utilization of the total area in transport vehicles and storage areas. But grains, fertilizers, agricultural herbicides and chemical inputs are different as they fit the shape of containers and thereby maximize the utilization of available space and minimize the risks of damages from transported or stored goods.

101 Fertilizers and agricultural herbicides also adapt to the specific nature of territories, but the adaptations follow a well-defined gradient, independent from the agrarian structure and they have the capability of scheduling to fit the needs of continual production systems. In a certain way, the difference in manufacturing continuous systems depends on the level of product heterogeneity. The flexibility of continuous systems and amply automated is limited to the changes which accompany a determined gradient. As opposed to manufacturing systems which intensively employ labor because the flexibility of human work is virtually infinite. Man is the creator in the ultimate instance of all goods and services, which are his final “creatures”. The continuous and automated systems are intermediate “creatures” which produce final limited heterogeneity “creatures”.

102 Albeit impressionistic and unsystematic. As we had previously

observed, the systematic exploitation of limits and possibilities of the productive diversification of outlying regions in a development process based on vertical integration of distinct chains X impellers and horizontal integration of distinct chains in these chains will be the object of another research work, which is in an initial process of development and should be published and released next year.

103 As a general rule, central links are the external demand for goods and services. Usually, they are the links associated to the impelling X activity, which originated the chain. In our examples, the grains (in the case of Northeastern Rio Grande State), wine (in the mountainous Gaucho region) and tobacco (in the tobacco growing region centered around Santa Cruz do Sul). Many times, however, the central links migrate or transform as time goes on. In the shoe-making chain in the Vale do Sinos the shoes (especially feminine shoes) are the central link. But in the leather goods industry, which is constituted in the region where leather artifacts were originally produced, focused on the demand for products related to country living (boots, saddles, bridles and halters, etc.).

104 We recommend especially reading two texts by Goldratt: *The Target* and *The Critical Chain*. Both were written as fiction, which make the reading pleasant and at the same time passive by being underrated by the academic reader of a more traditional profile. The support in the fiction is set directly and explicitly in an intellectual reference of great grandeur: Plato and his famous Dialogs. And in *The Target*, Goldratt structures the presentation of his ideas in a Maieutic system: Alex Rogo – is the director of a company in danger of going bankrupt – he contracts a consultant (Goldratt’s alter-ego) who only answers the questions of his anxious disciple by asking other questions, structured in a way as to allow for the unveiling of the solution. Besides this, the utilization of the fictional system facilitates the demonstration of a crucial element in the Goldratt system: which gives rise to the principle of investment administration based on bottlenecks is not an enterprising principle, but a universal principle. It is the basis for administering investment of any individual and in any organization (from the family to the Government). And finally, we would like to perceive the similarities on the administrative principle by the bottlenecks of Goldratt and the theory of centrality of (and the

necessities to focus and strengthen the) weak links of Mark Granovetter is not a mere coincidence. See Granovetter regarding this, 1983.

105 Countless times consciousness in which advantages are originated from agreed strategies are greater than the advantages obtained from opportunist and conflicting strategies which are only imposed after countless “matches” with “lose-lose” type results. But the recurrence of “prisoner dilemma” type solutions provides the basis for the self-criticism of opportunist agents.

106 For a succinct presentation on sub-optimal balances in regional economic games (focused on the prisoner dilemma and collective action) and on the role of the government sector in facing dilemmatic solutions, see Paiva, 2004 and Paiva, 2004b. On the role of productive chains in the accumulation of social capital in developing regions, see Paiva, 2012.

107 For Schumpeter innovation is, by definition, the foundation of emergency or the enlargement of profits. Thus, the innovation presupposes, or a diminishing of costs, or added value to (in a certain way a “new”) product, or a synthesis of both processes. The mere adoption of new technical processes – even if they involve the saving of natural, human, or mechanical resources – it cannot be characterized as an innovation if it does not result in the creation and/or increase profits. Unfortunately the confusion between “technological modernization” and innovation is quite frequent. Firms get loans to purchase productive systems in order to save on physical resources but drain financial resources are not innovating as expressed in the Schumpeter manner. Goldratt is completely conscious of this fact. The first “Maieutic dialog” between Alex Rogo and the alter-ego of Goldratt in *The Target* is one of the most efficient and caustic criticisms of this first mistake.

108 This is an attack on common sense that makes development as a simple and direct function of investment. Ten out of ten economists agree that development, innovation, and investment are related. But nine out of ten economists support this association to the Ricardian perspective (even when Keynesian and/or Schumpeterian are intended). For Ricardo (as well as for Malthusians and all the defenders of the Say law) the limit to capitalistic development is the need for resources. Then the needs for investment comes (enlarging the material resources)

through technical progress (saving labor and natural resources). In Keynes and Schumpeter the functional relationship among investment, innovation, and development are opposed to the Ricardian system. For Keynes, the centrality of investment is based on its nature of non-governmental autonomous demand. And in Schumpeter, the centrality of innovation is found in its surplus generating power (profits) and resulting in future stimulus in investments, that (by way of Keynesian) raises the level of the utilization of installed capacity and the generation of income and wealth. This is what we have sought to demonstrate since the beginning of this work, when the territorial focus of the analysis is the region, the autonomous relevant demand stops being the investment and starts to be exportation. Now, as to recover the contributions of Hirschman, Goldratt, and Penrose, clearly the relevant innovation in the linked regional systems is what makes the territory autonomous to the consolidated technological standards in (and adapted to) the more developed (satellite) regions (and nations). It is worthwhile to say: the outlying relevant innovation is that which is returns to take advantage of the local resources that are partially redundant in the non-bottle necks, it is the adoption of productive systems that minimize the investment per unit of return.

109 The case of the shoe industry in the Vale dos Sinos in Rio Grande do Sul State it is emblematic of the limits of restricted diversification in a single chain.

110 Even though – as you know very well – all and any informational system based on the declarations of interviewed people needs to be analyzed *cum grano salis*. In the case of census information (which is generally, declaratory) what is important is not so much the absolute values, but the relative. The number of people who declare to practice a unpopular profession is much less than the number who actually practice it. But this bias loses its importance when the QLs are analyzed basing it on territorial references (the focus is relevant) based on similar moral standards.

111 As we have seen in the fourth chapter, the QL is greatly influenced by the level of specialization in the reference territory. Thus, we have selected a reference territory especially specialized in some chain-activities (such as the sugar-alcohol in Alagoas State and in the western part of São Paulo State, or the soy bean crop in

the Southern and Mid-West states), the QL of a sub-region is that which presents a level of specialization discretely superior to the average but not very high, but its absolute production will be. As opposed to, if the reference territory is not very dedicated to a certain activity, any sub-region which dedicates marginal interest to the same will present a very expressive QL. Due to this, it is important that the QL be analyzed from the point of view of its participation in the activity being analyzed in the total production of the territory. The smaller the participation, the less significant the QL will be, the expressive sub-regional, and vice-versa.

112 Once again, an example can be used to understand the problem better. In the city like Foz do Iguaçu, located on the border of Brazil, Argentina, and Paraguay, simultaneously, it is the main destination of tourists in the country, one of the main avenues of access to two important commercial partners of Brazil and one of the main urban centers of Western Parana State, that is one of the most important grain and animal protein producing regions in Mercosul. The QLs of the activities associated to the maintenance of automotive vehicles are especially high. But they are not based on a single productive chain, but the three of them.

113 If the reference region also does not produce the goods or services, the QL will not be null, but undetermined, as the numerator, as well as the denominator of the fraction will be null.

114 As you have already seen, this step is contemporary to the strict identification of the relevant territory. As a general rule, the focus territory is not identical to the relevant. This latter is defined by the relationships of productive complementarity among centers and outlying regions. But this complementarity is only revealed from the identification of impelling activities in the focus territory and the way they articulate the impelling activities in the surrounding areas.

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## CARLOS ÁGUEDO NAGEL PAIVA

Bolsista de Produtividade em Pesquisa do CNPQ -  
Nível 2 (\*\*\*)

Bacharel em Economia (UFRGS), Mestre e Doutor em Economia (Unicamp) e Economista (Corecon 6716, Quarta Região). Bolsista de Produtividade CNPQ, Bolsista Pro-Redes I PEA e Bolsista Cátedras I PEA. Pesquisador da Fundação de Economia e Estatística do Rio Grande do Sul. Especialista em Teoria do Desenvolvimento Econômico, História Econômica, História do Pensamento Econômico, Economia Política, Macrodinâmica, Economia Regional e Economia Gaúcha. Autor do site [www.territoriopaiva.com.br](http://www.territoriopaiva.com.br)



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