

Review

Performance analysis model of productive local arrangements by the relationship between conditions and territorial indicators

Cardoso, Amilton Fernando^{1*}, Mendonça, Fabrício Molica² and Cabral, Arnaldo Souza¹

¹Institute of Aeronautical Technology – ITA, Brazil.

²Federal University of São João del Rey - UFSJ, Brazil.

Accepted 22 August, 2013

The main source of competitiveness are the elements of trust and cooperation between companies, obtained through close relations of economic, social, and community nature. Therefore, this type of territorial manifestation is determined not only by the characteristics of the physical environment, but also by cultural, social and historical characteristics present in a geographically defined area. However, there are few studies that relate the existence or not of conditionings and indicators that show the performance of the Local Productive Arrangements (LPA), since the conditionings cannot be considered as performance determinants of a LPA. The problem is that both are incomplete; there is the difficulty of working only with conditionings and to work only with indicators. So the purpose of this article is to construct a more robust theoretical model of assessment of LPA through association of performance indicators to the territorial conditionings existent in the literature, which is able to generate information to measure behaviors of LPA.

Key words: Performance indicators, territorial conditionings, LPA.

INTRODUCTION

The contemporary literature that involves investigations about territorial manifestations of micro and small enterprises as a model of development and economic growth indicates the trust and cooperation, established through close relationships of economic, social and community nature, as major sources of competitiveness. Therefore, this type of territorial manifestation, known in Brazil as the Local Productive Arrangement (LPA), is determined not only by the characteristics of the physical environment, but also by cultural, social and historical present in a geographically defined area. The concept of LPA is based on the idea that competitiveness comprises external factors related to the enterprises and internal ones related to the territory. These factors involve infrastructure, institutional and regulatory policy apparatus, training and education centers, skilled labor, as

well as non-market elements of the territorial environment such as non-formal cooperative practices and institutional ties (Fuini, 2006). The way these factors work in these areas influences the dynamic capacity of the LPA, causing some regions to grow and develop while others continue to exist in its most primitive form.

As the understanding of this type of industrial/regional organization became important in the implementation of development policies of countries and regions, a number of studies arose related to the Industrial Economy, Regional Economy and Geographic Economy, focused on the development of strategies to accelerate the gain of competitiveness through the promotion, development and maturation of LPA. In some of these studies, there are the so-called conditions and territorial indicators that point out the reasons that make the LPA, even occupying less

*Corresponding author. E-mail:amilthon@terra.com.br

dynamic spaces, become organized and innovative spaces, while others continue to have survival and informality characteristics. The conditions are interpreted as externalities that act on these territories in a positive, negative or restrictive way, giving to these areas a unique and distinctive character. And the territorial indicators are expressions of measures capable to provide information that allow to evaluate the territory and to compare results of the same LPA over time and also between the LPA.

However, what we have seen in the literature are the creation and employment of a significant number of conditions and territorial indicators in the investigations of LPA. This has generated a broad and diffuse volume of information, causing confusion, misinterpretation and, consequently, little qualitative improvement in studies of LPA. One cause of the problem is that researchers from different areas have created identical conditions and indicators using different nomenclatures, raising difficulties to the standardization and homogenization of the conclusions of the studies. Another cause is related to the fact that studies on conditions are dissociated from studies on indicators. Because of this, some authors seek to explain externalities through the use of indicators and others seek to evaluate the performance and compare the LPA through the use of territorial conditions. There are also researchers who apply conditions and indicators in their studies as if they were synonyms.

In this context, the following question arises: is it possible to find in literature a relationship between territorial conditions (externalities) and indicators (expression measures of such externalities), in order to obtain an analytical model capable of providing a performance measure for each externality found? The assumption underlying this argument is that if territorial conditions are the externalities that act on the territories in a positive, negative and restrictive way, and the indicators are measures that can express a behavior, then the indicators can be considered an expression of a territorial condition and, therefore, be able to assess LPA performance.

Thus, this paper aims to build a assessment theoretical model of Local Production Arrangements, through the association of performance indicators to territorial conditions existing in the literature, which is able to generate information to measure isolated behaviors of the LPA. More specifically, this study intended to: a) study the various territorial conditions created by different study areas and group them according to their similarities; b) study the existing territorial indicators and group them by similarity; c) Establish the relationship between conditions and indicators in order to create the theoretical model assessment of the LPA.

To meet the proposed objectives and prove the raised hypothesis, this study was conducted through a qualitative study of a descriptive way, using, for this, only bibliographic research. The non-application of the model

in empirical researches involving LPA is considered a limitation of the study.

TERRITORIAL CONDITIONS USED BY LITERATURE FOR EVALUATION OF LPA

To Lemos et al. (2003) territory is a socially constructed space, endowed not only by natural resources of its physical geography, but also by the history constructed by men who inhabit it, by means of convention rules and values, institutional arrangements, that give them expression, and by social forms of production organization. As a social space, the territory is a field of conflicting political forces, with structures of power and domination. Thus, the territory is both the locus of production of goods and capital accumulation as the construction locus of institutional arrangements of the instituted power, but mutant, which houses conflicts of interests and forms of collective action and coordination (Lemos et al., 2003). The forms of collective action are territorialized because they do not occur in the abstract space, but in the socially constructed space. The specific point that matters to understand is the limits of the collective action under the environments of the LPA, also considered a form of productive organization of the collective action of the economic activity in the social space.

So, for Lemos et al. (2003) the territorial conditions can be divided according to the territorial scale and the form of externalities that affect the LPA. The territorial scales that we consider relevant for the development of the LPA, are the national, regional and local scales. The latter comprises the productive place and the urban space in which the LPA are inserted. The international scale conditions the form of the country insertion in the world economy. However, we observe that many studies of conditions, seek through them, to understand why some LPA transform themselves into more organized and innovator models while others continue keeping levels of informality of survival. There are also the attempts of creation and organization of the LPA in certain regions that end up being doomed to failure. Many of these authors believe that in certain regions the territorial conditions present certain configurations that are determinants for success or failure of a LPA.

Considering that because of the multiplicity of existing concepts about the subject, and also because there is no consensus among researchers of this area, it was identified the need of a research as an attempt to elucidate some understandings about what can be considered conditions to the success of a LPA as well as what the likely causes for this. Several authors belonging to different lines of thought came over the years, searching for explanations for the success and failure of LPA through territorial conditions, among them, highlighting the work of: Porter (1999a), Suzigan et al. (2002), Mendonça

(2008) and Siqueira (2003).

Porter (1999a) highlights the role of the nation or locality for the competitiveness of certain industries. The author deals with the importance of the space in promoting competitiveness and its model is based on a diamond that tries to group through four attributes, the main conditions that shape the competitive scenery of the companies. These attributes are: a) Conditions of production factors involving the use of a country / region in relation to its factors of production necessary to compete in an industry such as skilled labor and infrastructure; b) Conditions of the demand involving magnitude of domestic demand, that is, the presence of consumers eager for innovations in products and services, pressing the companies for improvements; c) the correlated and supporting industries that involve the presence or absence, in the country / region, of supplying industries of correlated sectors to the primary segment; d) Strategies, structures and competition between companies, which involves the local presence of powerful rivals as stimulators of competition and favoring of innovation and productivity.

Suzigan et al. (2002) show that both the condition of success and failure of LPA are strongly conditioned by their historical roots, by the institutional construction process, by the social fabric, and the local cultural traits. Such conditions that the authors relate are linked to sustainability and competitiveness that have the ability to prolong the existence of a LPA that are measured by the ability of competition of their companies and, by extension, on its evolutionary trajectory in terms of growth of the production, job creation, technology development and insertion in the domestic and international market, and is strongly influenced by its historical roots, by the institutional construction process, by the social fabric, and by the local cultural traits. These factors condition to the local productive specialization, the possibility of emergence of local leadership, the existence of trust between local agents as a basis for joint actions of cooperation and labor division, the creation of business support institutions, and the structure of prevalent governance. The ways to ensure the sustainability and competitiveness in a determined region pass through the establishment of actions that allow greater interaction between the various actors and the construction and articulation of the processes through institutional mechanisms for adequate maintenance of developmental policies that promote the competitiveness.

Mendonça (2008) seeks to explain that in the LPA the territorial externalities act through Marshallian and Schumpeterian territorial, transactional and institutional conditions that act in the territories in a positive, negative and restrictive way, giving these areas a unique and distinctive character. The Marshallian conditions are related to the form of organization of the production and involve skilled labor, suppliers, infrastructure, natural resources,

market neighborhood, scale economies and access to information. The Schumpeterian externalities are related to the creation of an innovative environment characterized by the qualification of the labor force, proximity to universities and research centers, qualification of the workforce and technological capabilities of the companies, labor class associations and cooperation between competing companies. The transactional externalities arise from the transaction costs and are related to cooperation between competing companies; potential for cooperation to supplement resources and learning; collective efficiency. The institutional externalities arise from the institutional environment of companies. It is related to the interaction between companies, cultural aspects, social interaction, and identity, supporting political and social institutions, policies oriented to approach the LPA to the learning institutions, research and economic agents.

Siqueira (2003) tries to explain the behavior of the LPA, its success and failure through the quality of life in the regions in which they are installed. This means that the main goal of a LPA, due to concerns about the social and cultural environments, involving relations of solidarity, lead to the quality of life objective in the region. This view commonly found in LPA focuses only on a part of the larger problem. Improve the competitiveness of the LPA, persisting in the region a low per capita poorly distributed income and high unemployment, may bring instability to the region, with a consequent increase in poverty. This in the long term can destabilize even a consolidated and competitive LPA. Thus, the main objective of agglomerate should focus on improving the quality of life of the region. Improving the competitiveness of the LPA in the region happens to be just one of the projects of the development plan for the region. Therefore, the interactions between the actors of the arrangement may contribute to the promotion of economic spaces for local development and may have several positive externalities, that is, effect of the activities of production and consumption that are not reflected directly on the market, but have benefits such as the ability to create jobs, to establish a network of small local representation businesses and facilitate the improvement of the community life quality. So, supporting the organized ventures in LPA can lead to the success of all involved actors, while they can positively influence the development of the locality.

Besides these works, the literature receives the contribution of several other authors, taking into account the territorial conditions for evaluation of the LPA, such as: Fleury and Fleury (1987), Zacarelli (1995), Schimitz (1995 and 1997), Porter (1999b), Casarotto and Pires (2001), Haddad (2001), Britto (2002), Campos et al. (2002), Castelar et al. (2002), Cassiolato and Lastres (2003), Crocco et al. (2003), Lemos (2003), Gordon and McCann (2005), Aun et al. (2005), Majocchi and Presutti

(2009), Olave and Amato Neto (2005), through the analysis of the meanings that each author gives to his/her conditions, it was realized that such conditions could be summarized in 15 key conditions, namely: competition capacity, evolutionary trajectory, job creation, technology development, insertion in domestic and foreign markets, related companies, institutional construction, social fabric, productive specialization, leadership, trust between agents, cooperation, governance structure, collective efficiency, creation and diffusion of knowledge and innovation. Table 1 shows the fifteen conditions selected for construction of research model with the definitions and authors involved in each one.

PERFORMANCE INDICATORS USED IN STUDIES OF LPA

The definition of performance indicators becomes a crucial point for the evolution, competitiveness and sustainability of a company once they can be used as tools for mapping strategies in levels, departments and even locations of the same organization. Considering the features of a LPA the indicators try to measure the degree of consistent link of coordination, articulation, interaction, cooperation and learning (Cassiolato and Lastres, 2003). The use and suggestion of indicators is related to a form of specific understanding of the reality to be analyzed. The elaboration of indicators aims to measure a particular phenomenon. Measuring an activity is much more than adding numbers: it is necessary to ensure that the unit of analysis is homogeneous. The determination of which variables should be the object of the construction of indicators depends on being assumed certain criteria about the relevance of these ones. The definition of indicators is usually preceded by the fulfillment of certain choices regarding the significance and role of the variables (Stallivieri, 2009).

We start from the principle that the performance indicators to be captured and analyzed must take account of association with a group of relevant conditions to the understanding of the arrangements, characterized in this study as territorial restrictions, given the fact that the processes are territorially located and are conditioned by specific characteristics of the context in which they occur but it is also fundamentally important for the analysis of these structures, the identification of specific characteristics of the territory in which they are inserted. It is considered that the basic unit of analysis is the city or group of city, in which activities of the arrangement take place.

Authors belonging to different lines of thought, came over the years, seeking explanations for analyzing the performance of LPA through performance indicators, among them are the following researchers: Stallivieri (2009) Cassiolato et al. (2012), Carpinetti et al. (2008),

Crocco et al. (2003) and Farina and Zylberstajn (1994).

Stallivieri (2009) focused on building three indicators able to evaluate the potential of R&D and the learning ability of the LPA. The "R&D effort" indicator, tries to show that the greater the share of revenues in R&D activities is, the greater the competitive ability of the LPA will be. The "Technologic upgrade effort" indicator shows that the greater the amount of revenue that is employed in new technologies is, the greater the technological development will be associated with the competitive advantages of the LPA. The "Internal Learning" indicator which measures the degree of importance of the R&D department as a source of information for the LPA learning, aims to measure the capacity of creation and diffusion of new knowledge in the LPA.

Cassiolato et al. (2012) sought to develop six indicators to measure the performance of the LPA. The "Added value to production" seeks to measure how much is added to the production in the activities developed by the arrangement companies, getting with its application, over time, an evolution of that value. The "relevance of employment" indicator identifies the relevance of the activities of the LPA in terms of employment generation for the localities in which the LPA is inserted. The "Location Gini Index" indicator tries to validate the degree of inequality in the distribution of individuals in a space and can be used to detect potential agglomerations like the LPA, which is linked to social capital as a determinant factor for economic development. The "relevance business" indicator that allows us to measure the relevance of the activities related to the arrangement, as agents able to dictate the pace of growth of these productive spaces. The "cooperation rate" indicator identifies the share of companies of the APL that develops joint activities, based on mutual trust between the involved agents, either through horizontal or vertical cooperation. The "relevance of the transformation value" indicator measures the participation of the activities of the LPA in the total transformation value of the region, showing its collective efficiency.

Carpinetti et al. (2008) developed two evaluation indicators. The "participation of the LPA in domestic and foreign markets" indicator aims to show how the LPA is inserted either in domestic or in foreign markets, and when obtained in a time series, show the evolution of this integration over time and the evolution of the productive and marketing capacity of the companies of the LPA. The "Participation of institutions that streamline the LPA indicator" provides an indication of the institutional construction of the LPA and, when adopted in a time series, provides information related to the evolution of agents entering in a LPA.

Crocco et al. (2003) developed the "Location Quotient" indicator (LQ). This indicator has multiple functions, since, can confirm the existence of a productive specialization in a region; allows to analyze whether there

Table 1. Territorial conditionings selected to build the research model, their definitions and authors involved.

Territorial conditions	Definition	Authors
Competition capacity	Comprehends the responsible elements for improving the individual and collective competitiveness of the companies	Suzigan et al (2002); Porter (1999a and 1999b); Zaccarelli (1995); Gordon and Mccann (2005); Castelar et al. (2002); Mendonça (2008).
Evolutionary Trajectory	Deals with the evolution of production, quality and marketing of a LPA.	Suzigan et al (2002); Porter (1999a); Siqueira (2003); Mendonça (2008).
Job Creation	Includes the participation of production units through attitudes and joint practices in relation to the workforce in the increase of employment and income.	Suzigan et al (2002); Suzigan et al. (2003); (Mendonça (2008).
Technological Development	Relates the search for sustainable competitive advantage through research and studies of cooperative links between the productive structure of the LPA and institutions of R&D.	Suzigan et al (2002); Zaccarelli (1995); Haddad (2001); Majocchi and Presutti (2009); Mendonça (2008).
Insertion in the internal and external markets	Corresponds to the productive and marketable capacity of the organization in order to ensure sustainable competition conditions on the domestic and foreign markets	Suzigan et al (2002); Mendonça (2008).
Related Companies	Identifies the presence of local suppliers of specialized components, machinery and services capable to generate gains to the companies, through efficiency, knowledge and ease of technological innovation.	Porter (1999a); Zaccarelli (1995); Suzigan et.al. (2003); (Mendonça (2008); Castelar et. al. (2002).
Institutional Construction	Seeks to identify the legitimacy of a significant number of organizations with significant results for a particular space, in which there is interaction between the agents, allowing the generation of knowledge around a common economic activity.	Suzigan et al (2002); Casarotto Filho and Pires (2001); Haddad (2001); Mendonça (2008); Castelar et. al. (2002).
Social Fabric	Includes social capital as a determinant factor for economic development through mutual trust, participation, organization and horizontal cooperation among social actors.	Suzigan et al (2002); Majocchi and Presutti (2009); Siqueira (2003); Mendonça (2008).
Productive Specialization	Involves besides the production of goods and services themselves, knowledge, tacit or explicit, that people and organizations of a territory have around a major economic activity	Porter (1999a); Zaccarelli (1995); Suzigan et.al. (2003).
Leadership	Evidence an organization (company, institution, agent, etc.) that influences other actors of a LPA to achieve a common goal, so that their actions and commitment provide the sustainability of the environment in which it operates.	Suzigan et al (2002); Mendonça (2008).
Trust between agents	Based on historical patterns of association and long-term self-interest and calculation (cost / benefit) of utility to promote confidence.	Casarotto Filho and Pires (2001); Campos et. al. (2002); Haddad (2001); Mendonça (2008); Britto (2002).

Table 1. Contd.

Cooperation	Characterizes the relations maintained between companies across the unstable environment of negotiation which they are immersed.	Suzigan et al (2002); Olave and Amato Neto (2005); Britto (2002); Haddad (2001); Zacarelli (1995); Penrose (1962); Fleury and Fleury (1997); Mendonça (2008).
Governance structure	Identifies the channels (individuals or organizations) able to coordinate and promote business actions and decision-making processes between the actors of LPA	Porter (1999a, 1999b); Takeda et. al. (2008); Olave and Amato Neto (2005); Mendonça (2008).
Collective efficiency	Examines the ability of reducing expenses associated with transactions between economic agents	Schmitz (1995 and 1997); Cassiolato and Lastres (2003); Penrose (1962); Britto (2002).
Creation and diffusion of knowledge and innovation	Arise from the creation process and dissemination of new knowledge translated into products, so, innovation is a learning process of search and exploitation that result in new products, new techniques, new forms of organization and new markets.	Olave and Amato Neto (2005); Gordon and Mccann (2005), Crocco et. al. (2003); Casarotto Filho and Pires (2001); Aun, Carvalho and Kroeff (2005); Lemos (2003); Campos et. al. (2002); Porter (1999a); Mendonça (2008).

Source: Own elaboration.

are related companies in these agglomerates, and also if the existence of local expertise allows configuring the micro region as a LPA. Note that it is possible that there is a productive specialization in a region, characterizing it as a LPA, but there is scant presence or absence of related companies.

Zylberstain and Farina (1994) developed the "Numbers of structured organizations" indicator to indicate the number of organizations that coordinate institutional and market transactions of the LPA. The greater the indicator is, the greater the representation of involved actors in the governance structure of the LPA will be.

It is possible to highlight that the concepts, methods, techniques and practices for managing production may contribute to the development process in the PMEs inserted in the LPA (Suzigan, 2001). Using this hypothesis as the basis, the research objective is to propose an analysis theoretical model of success of LPA, through surveys of territorial conditions associated with a set of indicators able to measure the performance of such conditions, thus contributing to the evaluation of a LPA. The performance measurement in LPA is a challenge and still little explored in the literature. This stems from the high complexity of the relationships between the actors involved in a LPA. In the case of an individual company becomes easier to determine the organizational strategy, unfold indicators, collect data and communicate results.

The LPA, on the other hand, comprise several companies that are often competitors, but that sometimes can collaborate with each other. In addition, the regional performance depends not only on companies but also

the performance of other public and private institutions. Table 2 shows the selected set of indicators to measure the performance of the territorial conditions of a LPA.

CREATION OF THE PERFORMANCE EVALUATION MODEL OF LPA BASED ON THE RELATIONSHIP BETWEEN CONDITIONS AND INDICATORS

Mendonça (2008) points out that when positive and negative conditions are raised on territorial arrangements, can list policies that intensify the benefits of the presence of positive conditions and reduce the effects of negative and restrictive ones, despite the presence or absence of these conditions do not guarantee success or failure, because the evolution of these clusters depends on the overall effectiveness of the general interaction between all the components of the arrangement.

Thus, these conditions can serve as drivers of private and/or public actions to improve local or regional conditions for the growth of the number of the companies through investment incentives, technological development and exports, aimed mainly at increasing employment and income. The contribution of the raising of restrictions is the preparation of the ground for the joint action of the companies and those with agencies and local entities and the public sector.

The set of policies should be developed after conducting field researches in the LPA, previously identified by appropriate methods, such as those ones developed by authors such as Crocco et al (2003) and Suzigan et al. (2005), which can capture the specificities that condition

Table 2. Selected Indicators to measure the performance of the territorial conditions of an LPA.

Indicators	Meaning	Formula	UN	Author(s)
R&D Effort	It refers to the portion of the company invoices from the LPA who were engaged in research and development activities (R&D). Where: ESP & Dj represents the R&D effort of the LPA; GASP & Di, the R&D expenses of the company i of the LPA and; FATi the total invoices of the company i.	$ESP&D_j = \frac{\sum GASP&D_i}{\sum FAT_i}$	%	Stallivieri (2009)
Added value to production	It represents how much is added to the production in the activities performed by firms of arrangement. Where: VAPj is the value added in the production of the LPA; RLVi is the net income of the company i of the LPA; COi is the cost of the business operations of the company i of the LPA; GASSALi is the total expenditure on wages (plus wage labor taxes) of the company i of the LPA; PEOCi is the total staff employed in the company i of the LPA.	$VAP_j = \sum (RLV_i - (CO_i + GASSAL_i)) / \sum PEOC_i$	%	Cassiolato et al. (2012)
Relevance of employment	Identifies the relevance of the activities of the LPA in terms of employment generation for the city (ies) for the arrangement location. Where: RELEMPR is relevant to the city (ies) of the arrangement of jobs generated in the activities of the LPA; EMPRLPAi is the total of employment of the city (ies) i that operates in activity of the LPA and; EMPRI is the total of employment of the city(ies) i of the LPA.	$RELEMPR = \frac{\sum EMPRAPL_i}{\sum EMPR_i}$	UN	Cassiolato et al. (2012)
Technologic update effort	Corresponds to the portion of invoices spent on purchase of machinery and equipment. Where: ESA&Tj represents the technologic upgrade effort of the LPA; GASA&Ti is the total expenditure on the purchase of machinery and equipment of the LPA; FATi is the total invoices of the company i.	$ESA&T_j = \frac{\sum GASA&T_i}{\sum FAT_i}$	%	Stallivieri (2009)
% LPA participation in domestic and foreign markets	Indicates the participation of the LPA in domestic and foreign markets in order to monitor the evolution and integration of the companies of a LPA in their respective markets. Where: $\sum FATMIEMPRAPL + FATMEEMPRAPL$ is the sum of the gross income of the domestic market of the companies of the LPA with the gross income of the external market of the companies of the LPA. $TOTFATMEIAPL$ is the total gross income of the foreign and domestic market of the LPA.	$M\% = \frac{\sum FATMIEMPRAPL + FATMEEMPRAPL}{TOTFATMEIAPL}$	%	Carpinetti, Galdámez e Gerolamo (2008)
Location Quotient (LQ)	Confirms if the local specialization allows configuring the micro region as a LPA Where: QL is the Location Quotient; EMP_i is the employment of sector i in the city; $EMPTOT_j$ é o emprego is the total employment in the city j; $EMTOT_i$ is the total employment in the sector i in the Region and; $EMPTOTREG$ é o is the total employment of the Region.	$QL = (EMP_i / EMPTOT_j) / (EMTOT_i / EMPTOTREG)$	UN	Crocco et al. (2003)

Table 2. Contd

% institutions that dynamize the LPA	Sets an indicative of the institutional construction of a LPA, Where: $I\%$ is the percentage of institutions that dynamize the LPA; nI is the number of institutions and; nE is the number of enterprises.	$I\% = \frac{nI}{nE}$	%	Carpinetti et al. (2008)
Location Gini index	Aims to detect potential clusters as the LPA through LQ. Where: IG_i is the Location Gini index of the city I that integrate the LPA and; POP_i is the total population of the city i that integrate the LPA.	$I.GiniAPL = \sum IG_i * POP_i / \sum POP_i$	%	Cassiolato et al. (2012)
Business relevance	Identifies the relevance to the region of the activities related to the arrangement, in terms of business structure. Where: RELESTAB is relevant to the region / city (ies) of the arrangement of establishments that operate in the activities of the LPA; ESTABLPA i is the total of establishments in the region / city(ies) i that operate in the activity (ies) of the LPA; stabilization is the total of establishments in the region / city (ies) i of the LPA and; ESTAB i is the total of establishments of the region/city (ies) i of the LPA.	$RELESTAB = \frac{\sum ESTABAPL_i}{\sum ESTAB_i}$	%	Cassiolato et al. (2012)
Cooperation Rate	Identifies which share of the companies of the LPA that develops cooperative activities. Where: TAXCOOP i is the cooperation rate of the LPA; EMPRCOOP i are the companies of the LPA i that declared to cooperate; and EMPRTOT i are the total of companies of the LPA i .	$TAXCOOP_i = \frac{\sum EMPRCOOP_i}{\sum EMPRETOT_i}$	%	Cassiolato et al. (2012)
Number (s) of structured organizations (hierarchy)	Identifies the number of structured organizations that coordinate the market transactions, contracts or alliances and large company (hierarchy). It is the number of structured organizations that coordinate the institutional and marketing transactions of the LPA.	Number of organizations that coordinate the institutional and marketing transactions of the LPA	UN	Farina and Zylberstajn (1994)
Relevance of the transformation value	Checks what the participation in the activities of the LPA is in the total value of the transformation of the region / city. Where: VT LPA i is the relative participation in the transformation value of the activities of the LPA i ; $\sum VTATIV_j$ is the sum of the transformation value of the j existing activities in the arrangement and $\sum VTTOTATIV_i$ is the total transformation value generated by the set of activities of the city(ies) i of the LPA.	$VT APL_i = \frac{\sum VTATIV_j}{\sum VTTOTATIV_i}$	%	Cassiolato et al. (2012)
Internal learning	Establishes the importance attached by the arrangement companies the R&D activities. Where: INR&D j is the importance attached by the arrangement companies the R&D activities (obtained by gathering information carried by the coordinating bodies of the LPA); N is the total number of company arrangement or the investigated sample and, R&D i is the importance attached to the R&D by the company i of the LPA.	$NP\&D_j = \frac{\sum P\&D_i}{N}$	UN	Stallivieri (2009)

Where: i represents the company and j is the set of events that constitutes the indicator.
Source: own elaboration.

each of the clusters of companies, such as history, the evolution, the form of industrial organization, support institutions, the governance structure, among others (IEDI, 2003).

According to Crocco et al. (2005), the characteristics of the LPA may be centered either in the internal environment of the LPA or in the external environment as, for example, incomplete innovation system or unstable economic environment. As both the internal and external environment is involved with the LPA should be taken into consideration for the preparation of public policies.

Thus, studying the territorial conditions related to the LPA, in addition to observe the local external economies relative to market size, the concentration of skilled labor, the technological spillovers and other factors that favor the local specialization, it is also identified the internal characteristics that are usually present in the LPA, such as: a) the interaction through linkages of production, trade and distribution, b) cooperation in marketing, export promotion, supplies of essential inputs, R&D activities c) the support of local institutions, d) local leaders of coordination of public and private actions, e) the existence of some local forms of political, social or cultural identity that constitute the basis so that there is trust and information sharing among companies, f) existing programs (or already implemented) of productive organizational and technological restructuring, with or without the support of public funding organs.

Because of the different types of conditions and even with the presence of these with varied intensities, the LPA present very specific characteristics in their attributes, agents, the insertion in the environment itself, its kind of scale of production, its kind of innovation etc.. Thus, there is no single policy inflexible that serves to the purposes of any productive clusters and that can be applied anywhere. This analysis reinforces the concept established in the literature, that there is no single policy of development to be applied to all LPA, once they should be shaped according to the peculiarities of each agglomeration (UNCTAD, 1998; Ceglie and Dini, 1999). However, the analysis of the territorial conditions allows indentifying several common points even in LPA of different locations and even different sectors, appearing to be more linked to the structure of the industry than the places.

However, when you have indicators that measure these conditions it is possible to realize in a comparison process, which conditions are at a greater advantage in a LPA. It serves to give a representative number of each condition.

There are also some difficulties when analyzing conditions of success and measure them, through indicators, the performance of LPA such as: extensive and long-term work and with local agents of the LPA; unavailability of financial resources and an adequate infrastructure to develop research in the LPA; the processes of analysis

and measurement can be in practice, generic and impossible to evaluate them properly during the development of the research.

Therefore, other factors that may negatively influence the process of analysis of associated conditions to a set of performance indicators of LPA are: different visions of government and local institutions on the concept, the importance and performance measurement, limited human resources, infrastructure deficiencies of the LPA actors, the cultural aspects of these actors (related to social and economic environment) and the existence of managerial problems.

Making a comparison between the conditions raised about the indicators, it is clear that there is a relationship between them. Such as:

- a) The condition "Competition Capacity" of a LPA that is related to the way that the LPA can compete through technological and organizational innovation involving products and processes can be measured by the indicator "R&D Effort" which reveals how the income is being employed in research and development of products, due to the higher this indicator is, the greater the capacity of competition of the LPA.
- b) The condition "Evolutionary Trajectory" of the LPA that is correlated with the evolution of the production and marketing of a LPA can be analyzed by means of the indicator "Added Value to Production", as the greater the result of this indicator is, the greater the value added to production in the developed activities by the companies of the LPA will be.
- c) The condition "Job Creation" of the LPA that is related to the participation of the production units through joint attitudes and practices in relation to the workforce in increasing of employment and income can be determined by means of the indicator "Employment Relevance" that identifies the relevance of the activities of the LPA in terms of employment generation for the city(ies) of arrangement location, because the greater the result of this indicator is better the position of the LPA as the generation of new jobs will be and therefore a better quality of life for the population of the region where it is located.
- d) The condition "Technological Development" of the LPA that is associated with the pursuit of sustainable competitive advantage through researches and studies of cooperative links between the productive structure of the LPA and the R&D institutions, can be estimated by the indicator "Technological Update Effort" that checks how well companies invested in the acquisition of modern machinery and equipment and other technologies in order to dynamize and improve the internal processes and the development of new products, as the LPA to demonstrate greater technological upgrade effort features greater sustainable competitive advantage.
- e) The condition "Insertion in the Domestic and

International Markets" of the LPA that is related to the productive and marketing capacity of the organization in order to ensure sustainable competition conditions in the domestic and foreign markets, can be evaluated by means of the indicator "Participation of the LPA in Domestic and International markets" that serves to monitor the evolution and the integration of the companies of a LPA in their respective market niches, in order to ensure their sustainable competition conditions in the industrial segments that they act they, according to that the higher the percentage of the total billing of the LPA in domestic and foreign markets, more evident becomes the productive and marketing capacity of the companies of the LPA.

f) The condition "Correlated Enterprises" of a LPA is concerning with the presence of local suppliers of specialized components, machinery and services that generate gains to the companies, through efficiency, knowledge and ease of technological innovation, can be found through the "Location Quotient" indicator that identifies the local productive specialization and allows to configure the micro region of a LPA, once the LPA that have $LQ > 1$ and relative participation greater than 1%, called Britto and Albuquerque (2002) as a density criterion. Thus, it will be considered LPA those arrangements that present a minimum of 10 establishments in the respective sector and over 10 establishments in associated activities. This criterion is to capture both the scale of agglomeration, as well as the possible existence of cooperation in the agglomeration.

g) The condition "Institutional Construction" of a LPA that is characteristic of the legitimacy of a significant number of organizations with significant results for a particular space, in which there is interaction between the agents, allowing the generation of knowledge around a common economic activity can be analyzed by the indicator "Percentage of Institutions that Dynamize the LPA in Relation to the Total Number of Companies of the LPA" that is used to monitor the evolution and the integration of the companies of a LPA in the respective market niches in order to ensure their sustainable competition conditions in the industries that act, because the higher the percentage of the total billing of the LPA in domestic and foreign markets is, the more evident becomes the productive and marketing capacity of the companies of the LPA.

h) The condition "Social Fabric" of the LPA that is linked to the social capital as a key factor for the economic development through mutual trust, participation, organization and horizontal cooperation among the social actors, can be measured by the indicator "Location Gini index" that validates the degree of inequality existing in the distribution of individuals according to the home income per capita, since the index ranges from 0, when there is no inequality (the income of all individuals have the same value) to 1, when inequality is maximum (only

one individual has all the society income and the income of all the other individuals is null).

i) The condition "Productive Specialization" of the LPA is a relevant beyond the production of goods and services themselves, knowledge, tacit or explicit, that people and organizations of a territory have around a major economic activity, can be measured by through the "Location Quotient" indicator that identifies the local productive specialization and allows to configure the micro as an LPA, since they hold LPAs $QL > 1$ and relative share greater than 1%, called Britto and Albuquerque (2002) as a criterion for density. Thus, only those arrangements will be considered clusters that present a minimum of 10 outlets in the respective sector and over 10 outlets in associated activities. This criterion is to capture both the scale of agglomeration, as well as the possible existence of cooperation in the agglomeration.

j) The condition "Leadership" of a LPA that is related to an organization (company, institution, agent, etc.), influencing other actors of a LPA to achieve a common goal, so that its actions and commitment can provide sustainability of the environment in which it operates, may be calculated by means of the indicator "Business Relevance" which is used to identify the percentage of companies located in the city (ies) of the LPA that work in activities related to the arrangement in relation to the total of companies in the region / city (ies), since the higher the percentage of business relevance of the LPA is, it becomes more evident the importance of the activities and business structure related to the arrangement for the region.

k) The condition "Trust between agents" of the LPA which is relative to historical patterns of association and long-term self-interest and the calculation (cost / benefit) of the utility to promote confidence, can be measured by the indicator "Rate cooperation" that shows which part of the companies of the LPA that develop cooperative activities, due to the higher rate of cooperation between the companies of a LPA, the greater the degree of trust between the involved agents.

l) The condition "Cooperation" of the LPA is to regard the relations maintained between companies across the unstable trading environment to which they are immersed, can be measured by the indicator "Rate Cooperation" that identifies which portion of the companies of the LPA developing cooperative activities, because the higher the rate of cooperation between the companies of a LPA is, the greater the degree of cooperation that characterizes relations between the companies held against unstable trading environment to which they are immersed.

m) The condition "Governance Structure" of a LPA that is related to the channels (individuals or organizations) able to coordinate and promote business actions and decision-making processes among the actors of a LPA, can be seen through the indicator "Number of Structures Organizations that Coordinate Institutional and Marketing

Transactions of the LPA" which shows the number of structured organizations that coordinate marketing transactions, contracts or alliances and large company (hierarchy), since higher this number is the better is the representation of the actors involved towards the external environment of the LPA.

n) The condition "Collective Efficiency" of the LPA which is related to the ability of reduction of expenses associated with the transactions between economic agents, can be determined using the indicator "Relevance of the Transformation Value" likely to demonstrate that the difference between the gross value of the establishments production of the LPA and their operations costs (considering the location and the activity (ies) of the arrangement, because the higher the relevance indicator of the transformation value of the LPA is, the greater the efficiency level collective and the capacity of the associated expenses reduction with transactions between economic agents of the LPA will be.

o) The condition "Creation and Dissemination of Knowledge and Innovation" of a LPA that is inherent to the process of creation and dissemination of new translated knowledge into products, so innovation is a learning process of search and exploitation that results in new products, new techniques, new forms of organization and new markets can be analyzed by the indicator "Internal Learning" which measures the degree of importance of the R&D department as a source of information for learning in the LPA, because Stallivieri (2009) establishes the following measurement values: high importance = 1, medium importance = 0.66, low importance = 0.33 and, unimportant = 0.

Table 3 represents in summary the theoretical model of evaluation of the LPA through the association between the territorial conditions and the performance indicators existing in a dissociated way in the literature, contributing to the generation of information capable of measuring the behavior of the LPA. Through this model, it is noticed that in the literature, a performance indicator corresponding to each territorial condition was found.

Analyzing Table 3, it is clear that the performance indicators "location quotient" and "cooperation rate" were used to evaluate the performance of more than one condition.

The "location quotient" indicator may be employed to measure "Business related" condition when measuring the number of related companies in the region and can measure the "Productive specialization" when one wants to know the degree of specialization of the production of a LPA. The data used in the Location Index for both cases are different, since a region can have a strong specialization in production and at the same time, a poor performance of related companies.

The rate of cooperation, which meets the "Trust between agents" and the "Cooperation" conditions is

calculated using the same database. However, if one wants to evaluate the level of trust between agents, the focus of the analysis is related to long term historical patterns of association and self-interest and the calculation (cost/benefit) of utility to promote confidence. When the "Cooperation" condition was analyzed, this rate gives information related to the power of cooperation that already exists in the LPA.

It is noteworthy that the study was limited when showing the comparable performance indicators that can be considered as expressions of territorial conditions which also exist in literature, and may be used in evaluating the performance of a LPA. However, this study could not build nor analyze the performance and adaptations compound indicators that could be created from theoretical framework in existing literature. However, such compound indicators could be synthesized in a single but different measure aspects of each condition.

This causes the model to generate a volume of partial performance indicators that are able to analyze the performance of a LPA, but which fail to take into account the different contextual factors where each LPA is located. Another limitation of the study is the non practical application of the model, since this model was created just over a theoretical study, involving authors who work with the LPA analysis focusing on conditions and performance indicators in isolation. Such limitations can serve as a basis for the development of future studies.

FINAL CONSIDERATIONS

The paper aims to build a theoretical model for evaluating the Local Productive Arrangements (LPA) based on the combination of performance indicators with the territorial conditions hitherto dissociated in the literature. For this, we used qualitative, descriptive research based only on the literature involving territorial conditions and performance indicators.

The definition of the number of working conditions was through a survey of the conditions created in the various fields of study and grouping by similarity. Thus, it was possible to reduce them in fifteen key conditions, namely, competition capacity, evolutionary trajectory, job creation, technology development, insertion in domestic and foreign markets, related companies, institutional construction, social fabric, productive specialization, leadership, trust between agents, cooperation, governance structure, collective efficiency, creation and diffusion of knowledge and innovation.

The same procedure was adopted to meet the performance indicators applied in territorial studies. The indicators reduced in twelve key indicators: P & D Effort, Added value to production, Relevance of employment, technologic update effort, participation in domestic and

Table 3. Analysis model involving interaction between territorial conditions and performance indicators to evaluate the LPA.

Business conditions	Authors	Performance indicators	Unity	Authors	Data source	
					Primary	Secondary
Competition Capacity	(Suzigan et al., 2002) (Porter, 1999a, 1999b) (Zacarelli, 1995) Gordon; Mccann, 2005; Castelar et al. 2002) (MENDONÇA, 2008)	R&D Efforts	%	(Stallivieri, 2009)		Abit, Sebrae, Class Institutions
Evolutionary Trajectory	(Suzigan et al., 2002) (Porter, 1999a) (Siqueira, 2003) (Mendonça, 2008)	Added value to production	%	(Cassiolato et al., 2012)	Abit, Sebrae, Class Institutions	
Job Creation	(Suzigan et al., 2002) (Suzigan et al., 2003) (Mendonça, 2008)	Employment relevance	UN	(Cassiolato et al., 2012)		RAIS / MTE
Technological Development	(Suzigan et al., 2002) (Zacarelli, 1995) (Haddad, 2001) (Majocchi and Presutti, 2009) (Mendonça, 2008)	Technological update effort	%	(Stallivieri, 2009)	Abit, Sebrae, Class Institutions	
Insertion in the domestic and foreign market	(Suzigan et al., 2002) (Mendonça, 2008)	% participation of the LPA in the domestic and foreign markets	%	(Carpinetti; Galdámez; Gerolamo, 2008)		IBGE, FIESC, ABIT, SEBRAE
Correlated Companies	(Porter, 1999a) (Zacarelli, 1995) (Suzigan et al., 2003) (PENROSE, 1962) (MENDONÇA, 2008) (CASTELAR et al. 2002)	Location quotient (LQ)	UN	(Crocco et al., 2003)		RAIS / MTE
Institutional Construction	(SUZIGAN et al., 2002) (Casarotto Filho and Pires, 2001) (Haddad, 2001) (Mendonça, 2008) (Castelar et al. 2002)	% of institutions that dynamize the LPA/ total of companies of the LPA	%	(Carpinetti; Galdámez; Gerolamo, 2008)		Fiesc, Sebrae, City Hal, Class Institutions
Social Fabric	(Suzigan et al., 2002) (Majocchi and Presutti, 2009) (Siqueira, 2003) (Mendonça, 2008)	Location Gini Index	%	(Cassiolato et al., 2012)	Ibge, City Hall	
Productive Specialization	(Porter, 1999a) (Zacarelli, 1995) (Suzigan et al., 2003) (Penrose, 1962) (Suzigan et al., 2002) (Mendonça, 2008)	Location Quotient (LQ)	UN	(Crocco et al., 2003)		RAIS / MTE
Leadership	(Suzigan et al., 2002) (Mendonça, 2008)	Business relevance	%	(Cassiolato et al., 2012)		RAIS / MTE
Trust Between Agents	(Casarotto Filho; Pires, 2001) (Campos et al., 2002) (Haddad, 2001) (Mendonça, 2008) (Britto, 2002)	Cooperation rate	%	(Cassiolato et al., 2012)	PINTEC	
Cooperation	(Suzigan; Garcia; Furtado, 2002) (Olive; Amato Neto, 2005) (Britto, 2002) (Haddad, 2001) (Zacarelli, 1995) (Penrose, 1962) (Fleury and Fleury, 1997) (Mendonça, 2008)	Cooperation rate	%	(Cassiolato et al., 2012)	PINTEC	
Governance Structure	(Porter, 1999a, 1999b) (Takeda et al) (Olive and; Amato Neto, 2005) (Mendonça, 2008)	Number (s) of structured organizations that coordinate the institutional and marketing transactions of the LPA	UN	(Farina; Zylberstajn, 1994)		Sebrae, City Hall, Class Institutions
Collective Efficiency	(Schmitz, 1995, 1997) (Cassiolato; Lastres, 2003) (Penrose, 1962) (Britto, 2002)	Relevance of the transformation value	%	(cassiolato et al., 2012)		IBGE (PIA, PAS, PAIC, PAC, etc.)
Creation and dissemination of knowledge and innovation	(Olive and Amato Neto, 2005) (Gordon; Mccann, 2005) (Crocco et al., 2003) (Casarotto Filho and Pires, 2001) (Aun et al., 2005) (Lemos, 2003) (Campos et al., 2002) (Porter, 1999a) (Mendonça, 2008)	Internal learning	UN	(Stallivieri, 2009)	PINTEC	

Source: Own elaboration.

foreign markets, location quotient (LQ), perceptual institutions that dynamize the LPA Location Gini index, relevant business, cooperation rate, number (s) of structured organizations (hierarchy), relevance of the transformation value, Internal learning.

By studying the meanings of the conditions and indicators, it was possible to find, for each condition, a corresponding performance indicator, allowing the creation of a theoretical model for evaluating the LPA. The association of the indicators with the conditions is an opportunity to introduce comparable performance indicators, able to evaluate and measure the behavior of the LPA.

The "location quotient" and "cooperation rate" performance indicators were used to evaluate the performance of more than one conditions. These indicators are used with different focuses to meet different conditions.

The study was limited to show that comparable performance indicators in the literature can be considered as expressions of territorial conditions that exist in the literature and may be able to evaluate the performance of a LPA. There was no practical application of the model in any LPA. Also, it did not seek from that study the construction of compound performance indicators capable of synthesizing different aspects of each condition in a single measure.

For further research, the application of the existing model and refinement of this model to create compound indicators for evaluating the LPA is suggested.

REFERENCES

- Aun MP, Carvalho AMA, Kroell RL (2005). Aprendizagem Coletiva em Arranjos Produtivos Locais: um novo ponto para as políticas públicas de informação. V Encontro Latino de Economia Política da Informação, Comunicação e Cultura (ENLEPICC). Salvador Disponível em <<http://www.gepicc.ufba.br/enlepicc/pdf/AdrianeMariaArantesDeCarvalho.pdf>> Acesso em 05 de jun. de 2012.
- Britto J, Albuquerque EM (2002). Clusters Industriais na Economia Brasileira: Uma Análise Exploratória a Partir de Dados da RAIS. Estudos Econômicos. São Paulo, 32(1):71-102, Jan./Mar. Britto, J. Cooperação Interindustrial e Redes de Empresas: fundamentos teóricos e práticas no Brasil. 2ª ed. Rio de Janeiro.
- Campos RR, Cário SAF, Nicolau JA (2000). Arranjos e Sistemas Produtivos Locais e as Novas Políticas de Desenvolvimento Industrial e Tecnológico: Arranjo Têxtil do Vale do Itajaí/SC. Florianópolis: Ed. da UFSC.
- Carpinetti LCR, Galdámez EVC, Gerolamo MC (2008). A measurement system for managing performance of industrial clusters: A conceptual model and research cases. Int. J. Prod. Perform. Manage. 57(5):405-419.
- Cassiolato JE, Vargas M, Stallivieri F, Matos M, Amorim C (2012). Elementos para o desenvolvimento de uma tipologia de LPAs. Indicadores para Arranjos Produtivos Locais – Nota Técnica n. 5. MDIC, REDESIST, UFRJ. Disponível em <http://www.mdic.gov.br/sitio/interna/interna.php?area=2&menu=3108&refr=3065>. Acesso em 24 ago.
- Casarotto FN, Pires LH (2001). Redes de Pequenas e Médias Empresas e desenvolvimento local. São Paulo. Atlas.
- Cassiolato JE, Lastres HMM (2003). O foco em arranjos produtivos e inovativos locais de micro e pequenas empresas. In: Lastres HMM, Cassiolato JE, Maciel ML (Org.). Pequena empresa: cooperação e desenvolvimento local. Rio de Janeiro: Relume Dumará; UFRJ/Instituto de Economia. Cap. 1:21-34.
- Castelar AP, Valls L, Markwald R (2002). O Desafio das Exportações, Rio de Janeiro: Economia Social.
- Ceglie G, Dini M (1999). SME cluster and network development in developing countries: the experience of UNIDO. Viena: United Nations Industrial Development Organization (UNIDO).
- Conferência das Nações Unidas sobre Comércio e Desenvolvimento – UNCTAD (1998). Promoting and sustaining SMEs clusters and networks for development, expert meeting on clustering and networking for SME development. Genebra, Sep. pp.2-4.
- Crocco MA, Galinari R, Santos F, Lemos MB, Simões R (2003). Metodologia de Identificação de Arranjos Produtivos Locais Potenciais. Texto para discussão 212. Belo Horizonte: UFMG/CEDEPLAR.
- Farina EMMQ, Zylberstajn D (1994). Competitividade e organização das cadeias agro-industriais. Costa Rica: IICA.
- Fleury ACC, Fleury MTL (1997). Aprendizagem e inovação organizacional: as experiências de Japão, Coréia e Brasil. 2. ed. São Paulo: Atlas.
- Fuini LL (2006). A nova dimensão dos territórios: competitividade e arranjos produtivos locais (LPA). Rio Claro: UNESP. Revista Estudos Geográficos. ano 4. n.1. junho.
- Gordon IR, Mccann P (2005). Cluster innovation and regional development and analysis of current theories and evidence. In: Karlsson C, Johansson B, Stough RR. Industrial Clusters and inter-firm networks. Cheltenham Edgar Elgar.
- Haddad PR (2001). A organização dos Sistemas Produtivos Locais como Prática de Desenvolvimento Endógeno. Economia Regional – Teorias e Métodos de Análise. BNB, Fortaleza.
- Instituto de Estudos para Desenvolvimento Industrial-IEDI (2003). Clusters ou sistemas locais de produção e inovação: identificação, características e medidas de apoio. In: Seção estudos: indústria e política industrial. Disponível em: <<http://www.iedi.org.br>>. Acesso em 15 ago. 2012.
- Lemos CR (2003). Micro, Pequenas e Médias Empresas no Brasil: novos requerimentos de políticas para a promoção de sistemas produtivos locais. Rio de Janeiro. Tese (Doutorado) Universidade Federal do Rio de Janeiro, COPPE.
- Lemos MB, Santos F, Crocco M (2003). Arranjos produtivos locais sob ambientes periféricos: os condicionantes territoriais das externalidades restringidas e negativas. In: XXXI ENCONTRO NACIONAL DE ECONOMIA –ANPEC, Porto Seguro. Anais do XXXI Encontro Nacional de Economia –ANPEC.p.01-20. Disponível em:<<http://www.anpec.org.br/encontro2003/artigos/E31.pdf>> Acesso em 14 abr. 2013.
- Majocchi A, Presutti M (2009). Industrial clusters, entrepreneurial culture and the social environment. The effects on FDI distribution. International business Review.
- Mendonça FM (2008). Formação, desenvolvimento e estruturação de arranjos produtivos locais da indústria tradicional do Estado de Minas Gerais. 266 f. Tese (Doutorado em Engenharia de Produção) - Universidade Federal do Rio de Janeiro, COPPE, Rio de Janeiro.
- Olave MEL, Amato Neto JA (2005). A formação de redes de cooperação e clusters em países emergentes: uma alternativa para PMEs no Brasil. In: AMATO NETO, J. (Org.) Redes entre organizações: domínio do conhecimento e da eficácia operacional. São Paulo: Atlas.
- Penrose E (1962). La Teoría del Crecimiento de la Empresa. Madrid: Agillar.
- Porter MA (1999a). Vantagem Competitiva das Nações. Tradução Waltensir Dutra. 5. ed. Editora Campus. Rio de Janeiro.
- Porter M (1998). Cluster and the new Economics of Competition. E. Harvard Business Review nov-dec.
- Porter M (2000). Clusters and the new economics of competition. Harvard Bus. Rev. 76(6):77-90, Nov./Dec.
- Porter M (1999b). Competição = On competition: estratégias competitivas essenciais. Rio de Janeiro: Campus.

- Schmitz H (1997). Collective efficiency and increasing returns. IDS Working Paper, Journal of Development Studies, n 4.
- Schmitz H (1995). Collective efficiency: growth path for small-scale industry. J. Dev. Stud. 31(4):529.
- Siqueira TV (2003). Os Clusters de Alta Tecnologia e o Desenvolvimento Regional. Rio de Janeiro: Revista do BNDES 10(19):129-198.
- Stallivieri F (2009). Ensaio sobre Aprendizagem, Cooperação e Inovação em Aglomerações Produtivas na Indústria Brasileira. Niterói: UFF, Tese de doutorado.
- Suzigan W, Furtado J, Garcia R, Sampaio S (2005). Identificação, caracterização, construção de tipologia e apoio na formulação de políticas de Arranjos Produtivos Locais (LPAs) do Estado do Paraná. Curitiba: IPARDES, SEPL.
- Suzigan W (2001). Aglomerações industriais, como focos de políticas. Revista de Economia Política 21(3):28-39, Jul./Set.
- Suzigan W Furtado J, Garcia R, Sampaio S (2003). Coeficientes de Gini Locacional – GL: LPAiação à indústria de calçados do Estado de São Paulo. Nova Economia 13(2):39-60.
- Suzigan W, Garcia R, Furtado J (2002). Clusters ou Sistemas Locais de Produção e Inovação: Identificação, Caracterização e Medidas de Apoio. Rio de Janeiro. Disponível em <http://www.iedi.org.br/admin/pdf/20030516_clusters.pdf> Acesso em 10 de jul. 2012.
- Takeda Y, Kajikawa Y, Sakata I, Matsushima K (2008). Na analysis of geographical agglomeration and modularized industrial network in a regional cluster. A case study at Yamagata prefecture in Japan. Technovation. 28:531-539.
- Zacarelli SB (1995). A nova ideologia da competição. Revista de Administração de Empresas. São Paulo: 35(1):14-21, jan/fev.