



BUILDING COUNTRY-SPECIFIC ADVANTAGES (CSA): UNDERSTANDING HOW FTZ INCENTIVES IMPACT STRATEGIC PLANT LOCATION AND BUYER-SUPPLIER RELATIONSHIPS

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ABSTRACT: We explore how leading companies manage relationships in supply chains that are not formed by natural market forces. Rather, they were stimulated by exogenous forces, such as the Free Trade Zones that are created by the Government's policy initiatives for purposes of regional development. We researched electronic industry in Manaus, located in the Brazilian Amazon Rain Forest. Multi-methods using qualitative, structured interviews, and quantitative approaches, structural modeling equation, were used. Results indicated that the companies settled for a location that they would not do under normal conditions and, secondly, that there was an expectation of externality as the makers of the strategy, in this case the public entity. Coordination among the members is not enough structured. No strategic supplier was found on the local FTZ, indicating that the local suppliers are only based on the premise of volume vs. logistics cost.

Keywords: Free Trade Zones, Brazil, Amazon Rain Forest, Country-Specific Advantages

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1 INTRODUCTION

Increased competition has provided new variables assume key roles in firm decisions. At the international plain, the competitive ability of enterprise consists of country-specific advantages (CSA) and firm-specific advantages (FSA) that both have synergetic effect for the successful international enterprise. FSA defines strategic reasons for site location to take CSA based upon access to low-cost production input factors, including mainly labor, raw materials and energy (FERDOWS, 1989). Many authors approached this theme and now it is understood that many factors may affect site location choices, converging to an agreement that the three major factors are indeed access to low-cost production, access to skills and knowledge, and proximity to market (FELDMANN and OLHAGER, 2013).

In addition, some scholars had studied hard CSA mainly focusing on country's natural resources endowments, labor resources and related cultural factors, like classical Ricardo's Principle of Comparative Advantage, complemented by Heckscher-Ohlin's "resource endowment theory". Later, others incremented this analysis by including different conditions of home country created their own trade advantages, scale advantages, location advantages, organizational advantages and other specific advantages, which formed diversified business advantages for domestic enterprises to participate in overseas investment, which can be located at Porter's contributions, with his seminal book published in 1990, "Competitive Advantage of Nations" (ZHANG, 2016).

However, countries can use a different source of country-specific advantages (CSA) that belongs to a national development strategy, with differentiation of taxation and tax exemptions that drives firms to define the location of its facilities because of costs. For instance, Free Trade Zones (FTZs) are regulated areas designed to attract oriented companies to produce and export their products by offering special benefits, such as tax breaks, customs and regulatory advantages and infrastructure (AMENGUAL and MILBERG, 2008). In this case, often the cost reduction strategy conflicts with the value-added strategy through the formation of the company's supply network to seek relationships new sources of competitive advantage. The direction can put the company in a place where its local supplier network is under developed. In addition, it can bring additional challenges of convincing global suppliers to move their operations to the new location, which can bring strong logistics constraints and non-favorable labor qualifying conditions. This article aims to extend the discussion of the conditions of formation of relationships in the supply network, helping to improve the understanding of the background of relationships in supply networks. Specially, it proposes a situation outside the "normal" market, because the subject field is an Industrial Pole in Manaus, Brazil. Manaus is located in the middle of Amazon Rain Forest, which is located far from supply and consumption centers. However, firms from different countries and economic sectors move and manufacture there due to Federal tax incentives. According to the Suframa (2016), companies in the Industrial Pole of Manaus (PIM) closed the year 2015 with cumulative sales of about US\$ 25 billion. This study focuses in the electronics industry. We understand that the structure of a supply network has a strong impact on your performance (KIM et al., 2011).

To show the complexity of relationships in these supply networks and their importance at the heart of business strategies point to new knowledge regarding the state of the art, we focused in the leader firms in the industry. This decision was based on the principles that competitiveness emerges not only from its internal resources, but also those accessed by it through its network of relationships. Therefore, the contribution of this research can be found in the discussions and the elucidation of how leading firms manage relationships in the supply networks they are immersed. We do that by differentiating supply networks that are formed by natural market forces from those stimulated by exogenous forces. In this case, the Free Trade Zones that are created by government policy initiatives aiming for regional development.

2 THEORETICAL BACKGROUND

2.1 SUPPLY CHAIN INTEGRATION

According to Gattorna (2009), a supply chain has to do with both the management of production and information flows and all the activities, which add value for each member of the chain, so that the chain aggregates greater value for the final customer. Frohlich and Westbrook (2001) argue that during the 1990s there was increased consensus about the importance of supply chain integration. The efficiency of such integration became a key factor in order for the chain to be completely successful in attaining such objectives as costs and level of service, required in order to become more competitive. Zailani and Rajagopal (2005) emphasize the increased importance of integrating strategic actors in the supply chain in order to leverage competitive advantage.

This integration takes place unevenly and with different levels of development, according to the type of governance and the nature of the business and the competition. Stevens (1989) was one of the first authors to draw up a table showing how the establishment of integrated supply chain management has evolved. After examining the motives and reasons for the formation of integrated supply chains, he suggested that there were four stages in the establishment and integrated management of supply chains. For Cooper et al., (1997), supply chain integration requires efforts to coordinate companies, including the integration of internal processes and functions as well as those of the whole supply chain. According to these authors, integration is motivated by the recognition that combined efforts maximize the results obtained by the chain as a whole.

On the other hand, Power (2005) holds that the basis of supply-chain integration derives from cooperation, collaboration, sharing of information and technology, trust, partnerships and, above all, from a change in management philosophy regarding process management, which comes to be integrated throughout the chain. For Davenport (1994) business activities should not be understood in terms of functions or departments but rather in terms of the concept of key processes. This author argues that one of the main organizational tendencies has been the change from traditional functional structures to those based on process management.

In sum, according to Lee (2000), the integrated supply chain management makes it possible to deal efficiently with growing customer needs. He holds that supply chain integration can be measured by means of three fundamental dimensions: 1) information integration; 2) coordination and sharing of resources; and 3) organizational relationships. Mentzer et al., (2001) present a multidimensional construct for supply chain management that is based on information sharing, sharing of risks and returns, cooperation, similarity of objectives, customer-focused approach, integration of key processes, long-term relationships and inter-functional cooperation. Frohlich and Westbrook (2001) define the variables that constitute supply chain management as follows: integrated planning between companies in the chain, information sharing; sharing of resources and logistic operators; standardization of packaging; information about stock levels and mix, and integration of production plans. Burgess, Singh and Koroglu (2006) present a model based on the ideas put forward by Mentzer et al., (2001) and by Chen and Paulraj (2004). It consists of five constructs: 1) information sharing; 2) long-term relationships; 3) collaboration; 4) logistic integration and 5) risks and rewards sharing.

Table 1 is based on a review of the literature dealing with supply-chain integration and shows the constructs used to evaluate the degree of integration between focal companies and local suppliers in the MIP.

TABLE 1 - Summary of the Construct Supply-Chain Integration

CONSTRUCT	OBJECTIVE	THEORETICAL FOUNDATIONS
Information Sharing	Measure the degree of information sharing between focal companies and suppliers in the economic sub-sectors of MIP.	Cooper et al., 1997; Mentzer et al., 2001; Frohlich and Westbrook, 2001; Simatupang and Sridharan, 2002; Lee, 2000; Chopra and Meindl, 2001; Chen and Paulraj, 2004; Power, 2005; Zailani and Rajagopal, 2005; Das et al., 2006; Burgess et al., 2006; Sezen, 2008, Gunasekaran et al., 2008; Bayraktar et al., 2008.
Resource Sharing	Identify the resource-sharing practices in the supply chain in the economic sub-sectors of the MIP.	Wernerfelt, 1984; Rumelt, 1991; Dyer and Singh, 1999; Harland et al., 2004; Frohlich and Westbrook, 2001; Themistocleous et al., 2004; Sezen, 2008; Jiang et al., 2015.
Risks and Rewards Sharing	Measure the level of sharing of risks and returns between focal companies and suppliers in the economic sub-sectors of the MIP.	Lee, 2000; Mentzer et al., 2001; Simatupang and Sridharan, 2002; Burgess et al., 2006; Fawcett et al., 2008.
Support from Top Management	Measure the level of support from top management for initiatives to promote supply-chain integration in the economic sub-sectors of the MIP.	Maloni and Benton, 1997; Donaldson and O'Toole, 2000; Chen and Paulraj, 2004; Kelle and Adbulut, 2005; Kim, 2006.
Supply Chain Coordination	Identify coordination practices in the supply chain in the economic sub-sectors of the MIP.	Lee, 2000; Mentzer et al., (2001); Chopra and Meindl, 2001; Flynn et al., 2010; Tsanos et al., 2014; Mellat-Parast and Spillan, 2014.
Key Processes Integration	Measure the level of integration of key processes in focal companies and suppliers in the economic sub-sectors of the MIP.	Croxton et al., 2001; Chen et al., 2009; Power, 2005; Slack et al., 2008; Foerstl et al., 2013; Day et al., 2015.
Relationship Management	Identify the relationship-management practices in the supply chains in the economic sub-sectors of the MIP.	Lee, 2000; Mentzer et al., 2001; Chen and Paulraj, 2004; Burgess et al., 2006; Slack et al., 2008.
Integrated Logistics	Measure the level of logistic integration in the supply chains in the economic sub-sectors of the MIP.	Chen et al., 2009; Themistocleous et al., 2004; Power, 2005; Burgess et al., 2006; Mellat-Parast and Spillan, 2014.

2.2 COLLABORATIVE RELATIONSHIPS

The concept of collaboration is related to different areas of knowledge such as Marketing, Economics and Supply-Chain Management, and each of these has different theoretical approaches. From the Industrial Marketing perspective, long-range relationships are contrasted with traditional relationships based on short-term commercial transactions where the relationship is primarily based on purchase price (SPEKMAN et al., 1998; SPEKMAN and CARRAWAY, 2006). In this case, long-term relationships require partners to commit themselves to high levels of investment and to creating networks to ensure both the continuity of the relationships and that all the partners have uniform goals.

Collaboration between customers and suppliers is one of the essential features of Supply Chain Management (HEIKKILA, 2002). According to this theoretical viewpoint, constant long-term effort is required in order to maintain relationships with the partners being committed to the continuous improvement of the chain as a whole. This approach has been used to classify and justify the collaboration constructs presented at the end of this section.

Moreover, acknowledgment of inter-organizational dependence within the supply chain is one of the principal sources motivating development of collaborative relationships within the chain (MENTZER et al., 2000; CHOI et al., 2002; SIMATUPANG and SRIDHARAN, 2008).

From the moment that companies recognize that they are dependent on the whole chain, the opportunity to develop collaborative relations presents itself and this that make it possible to share information and creates willingness to plan collectively (SIMATUPANG and SRIDHARAN, 2002; BARRATT, 2004).

According to Spekman et al., (1998), cooperation is no longer seen to be a process between a set of commercial partners. There needs to be cooperation throughout the supply chain. The basic premise, according to these authors, is that the new type of competition is global and companies have to respond rapidly to market change. Cooperation emphasizes the need to integrate functional silos as interdependent elements that are responsible for satisfying final customer needs and whose main aim is to provide competitive advantages for the entire supply chain. Heide and John (1990) also share the idea that ties of trust are able to make a positive contribution to the long-term stability a supply chain.

Table 2 is based on a review of the literature dealing with supply chain integration. It was used to draw up a proposal for the constructs to be used in evaluating the degree of integration between focal companies and local suppliers in the MIP economic sub-sector supply chain.

TABLE 2 - Summary of the Construct Collaboration

CONSTRUCT	OBJECTIVE	THEORETICAL FOUNDATIONS
Information Sharing	Measure the degree of information sharing between focal companies and suppliers in the economic sub-sectors of MIP.	Cooper et al., 1997; Mentzer et al., 2001; Frohlich and Westbrook, 2001; Simatupang and Sridharan, 2002; Lee, 2000; Chopra and Meindl, 2001; Chen and Paulraj, 2004; Power, 2005; Zailani and Rajagopal, 2005; Das et al., 2006; Burgess et al., 2006; Sezen, 2008, Gunasekaran et al., 2008; Bayraktar et al., 2008.
Resource Sharing	Identify the resource-sharing practices in the supply chain in the economic sub-sectors of the MIP.	Wernerfelt, 1984; Rumelt, 1991; Dyer and Singh, 1999; Harland et al., 2004; Frohlich and Westbrook, 2001; Themistocleous et al., 2004; Sezen, 2008; Jiang et al., 2015.
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Relationship Management	Identify the relationship-management practices in the supply chains in the economic sub-sectors of the MIP.	Lee, 2000; Mentzer et al., 2001; Chen and Paulraj, 2004; Burgess et al., 2006; Slack et al., 2008.
Integrated Logistics	Measure the level of logistic inte-	Chen et al., 2009; Themistocleous et al., 2004; Power, 2005; Burgess et al., 2006; Mellat-Parast and Spillan, 2014.

The constructs “Information Sharing”, “Resource Sharing”, and “Risks and Returns Sharing” are commonly associated with both supply chain integration and collaboration (ELLRAM, 1991; MENTZER et al., 2000; SIMATUPANG and SRIDHARAN, 2002; BARRATT, 2004; KAMPSTRA et al., 2006). For the purpose of this research, these elements are considered to be part of the construct “Supply Chain Integration”.

3 METHODS

Os institutos de pesquisa, desenvolvimento e inovação apresentam uma limitação atual em atender demandas de projetos de inovação dos setores industriais decorrente de dificuldades de planejamento e gestão (EMBRAPPII, 2014). Dessa forma, verifica-se a necessidade de um modelo de gestão eficaz e eficiente que permita o planejamento e controle de projetos, de uso de recursos, de compras e de pessoas.

Destarte, apresenta-se uma proposta de modelo de gestão estratégica que busca atender às necessidades dos institutos de pesquisa, desenvolvimento e inovação por meio da integração de Planejamento Estratégico, Gestão da Qualidade Total, Gestão da Competência e Ciclo de Aprendizado de Kolb. O modelo proposto é um processo contínuo, sistemático e gradual que visa melhoria, desenvolvimento e aprendizado da organização, aperfeiçoando dessa maneira seu desempenho.

3.1 PLANEJAMENTO ESTRATÉGICO

In order to qualify the relationships of focal companies with local suppliers, we conducted a qualitative and quantitative study. Because of the complexity of the existing organizational settings in PIM, we sought to deepen the analysis of the subjects to be investigated over quantity, through a multiple case study of exploratory nature (YIN, 1989; STAKE, 2008) as directed by some authors (YIN, 2009; CRESWELL, 2007). Multiple case studies allow the researchers to better understand the units seen in their wider context (COLLIS and HUSSEY, 2009). In addition, the qualitative and quantitative methods opens up a range of opportunities for the research process and makes the study stronger (CRAIGHEAD et al., 2007, GOLICIC and DAVIS, 2012).

3.1 UNIVERSE, SAMPLE, AND UNITS OF ANALYSIS AND OBSERVATION

This research was conducted in the Industrial Pole of Manaus (PIM). PIM was initiated in the 1950s, with the initial purpose to safeguard the sovereignty of Brazil in the Amazon region (Bomfim; Botelho, 2009). It was initially based on tax incentives and evolved over the years to an industrial complex that houses around 500 companies from different nationalities operating in 19 industries and sub-sectors of activity (SUFRAMA, 2016).

For purposes of this research, we selected the electronic industry. The five selected focal firms represent five different nationalities, which are American, Brazilian, Chinese, Korean, and Japanese. These companies were the subject of the qualitative study while also indicated their main local Tier-1 suppliers for contact, illustrating a snowball contact approach for the quantitative study (COOPER; SCHINDLER, 2003; HAIR Jr et al., 2005). The focal firms were selected based on their financial and production importance to PIM. It is important to note all the Tier-1 suppliers were researched. In this case, it was this the universe of the suppliers and not a sample. All nominees were invited and agreed to participate. Table 3 presents a summary of the number of Tier-1 local suppliers identified for each focal firm.

TABLE 3 - Focal firms and number of Tier-1 local suppliers at PIM

Nationality of the leader firm	MELHORIA DO PROCESSO
American	13
Brazilian	16
Chinese	15
Korean	25
Japanese	23

The unit of analysis in this study is the relationship between focal firms of selected electronic industries at PIM with their Tier-1 local suppliers. The units of observation were thus the focal firms and their suppliers. The subjects were individuals directly involved in managing the focal companies' supply network and local suppliers (directors, managers, chiefs, and coordinators).

3.2 DATA COLLECTION AND METHODS OF ANALYSIS

This study had two different phases of data collection: a qualitative and a quantitative data collection. The qualitative phase was comprised of in-depth interviews based on a semistructured interview script conducted with the focal firms. The interview technique is one of the most used in research in Social Sciences, as a basic tool of information when using the case study method (YIN, 2009). Thiollent (1997) adds that the semistructured interview, should contain a small number of open questions related to the issues that were deemed priorities by the researcher. For the interview script validation used in the qualitative phase of this research, the questions asked were initially presented to a group of three logistics professionals with academic degrees and reputation in the logistics market. Data from the interviews conducted with managers from the five focal firms were analyzed through content analysis. Content analysis is defined as a set of communication analysis techniques rooted in rigor of the method as a way to not get lost in the heterogeneity of its object (BARDIN, 2004).

On the quantitative part of the study, we used self administered questionnaires to collect data from the focal firms' Tier-1 suppliers. In order to measure the degree of integration of the supply chain and the breakdown of relationships among focal companies and local suppliers, 15 constructs were developed from the literature review considering the two basic researched dimensions, which are supply chain integration and collaboration. Table 4 shows the number of variables associated with the constructs and dimensions.

TABLE 4 - Summary of Constructs Chain Integration and CollaborationFonte:

Theoretical Basis	Constructs	Number of Variables
Supply Chain Integration	- Information Sharing (IFS)	13
	- Resource Sharing (RSS)	11
	- Risks and Rewards Sharing (RRS)	14
	- Senior Management Support (SUP)	13
	- Chain Cordenation (COO)	12
	- Key Processes Integration (KPI)	9
	- Relationships Management (RMN)	12
	- Integrated Logistics (INL)	9
Collaboration	- Trust (TRU)	9
	- Joint Resolution of Problems (JRP)	8
	- Integrated Planning (INT)	8
	- Joint Development (JND)	7
	- Joint Learning (JNL)	9
	- Benefits Sharing (BFS)	6
	- Flexibility (FLX)	11

Source: Elaborated by the authors, 2017.

The auto-administered questionnaire was evaluated on the topics of reliability (evaluation test-retest) and homogeneity (internal consistency method - Cronbach's alpha) (COOPER and SCHINDLER, 2003; HAIR Jr. et al., 2005). The questionnaire consisted of statements to be evaluated in accordance with Likert scale levels of 7 points (HAIR Jr et al., 2005; HILL and HILL, 2008). In this quantitative stage, the focus was directed to the measurement of the constructs defined for this study. The measurement of the variables in each of the constructs of the research was done by order of agreement on statements, where 1 represented "practice non-existent in the relationship with the focal firm, and 7 "common practice in the relationship with focal firm". The scale used was the horizontal linear type non-structured, with the advantage of the absence of a numeric value along the scale, in order to gather responses that were more objective (STONE and SIDEL, 1993).

The data analysis model sought to highlight relationships between collaborative and integrative relationships dimensions and their constructs. The goal was to explain how the relationship between focal firms and their Tier-1 suppliers happen in situations that were not simple reactions to market opportunities. Rather, they were reactions

to exogenous forces, in this case, tax incentives in a free trade zone. These relationships were evaluated Structural Modeling Equation. SME includes a set of related procedures that simultaneously combine multiple regression techniques, factor analysis (exploratory and confirmatory) and diagram paths, allowing the generation of multiple results (KLINE, 2011). Authors like Kelloway (1998), Hair et al., (2009), Mechinda et al., (2009) indicate the method as appropriate to test and analyze the causal interrelations between latent variables (HAIR Jr. et al., 2010).

Once tabulated, the data were exported to Statistical Package for Social Sciences (SPSS) for descriptive analysis with application of factor analysis. FA helps to convert a large number of variables into a smaller number of variables, called factors, which capture as much information as possible from the original data set (PARASURAMAN et al., 2004). The exploratory factor analysis (EFA) followed a series of procedures to validate the consistency and reliability of data and adjust them to the modeling process (NETEMEYER et al., 2003), using the dimensionality analysis and reliability evaluation techniques in order to identify underlying variables, or factors, that explain the pattern of correlations of existing variables analyzed in each constructo (THOMPSON, 2004; HAIR Jr et al., 2013).

The structural equation model was adjusted through Analysis of Moment Structures software (AMOS®), with application of the Confirmatory Factor Analysis (CFA). At this stage, the convergent validity of measures were used to test the significance of the factor loadings (HAIR Jr et al., 2013), discriminant validity to compare the average variance extracted of the variables of each construct with the shared variance between the theoretical constructs (R2) and the nomological validity was used to test the hypotheses of the model (KLINE, 2011; HAIR Jr et al., 2013). Table 5 presents the main principles adopted to assess the quality and fit of the model.

TABLE 5 - Measures used to assess the quality and fit of the model

METHOD	MELHORIA INDIVIDUAL
Number of parameters (NPAR)	-
Chi-square statistic (χ^2)	-
Degrees of freedom (d.f.) p-Value	>0.050
Chi-square standardized ($\chi^2/d.f.$)	>1.000 <5.000
Good Fit Index (GFI)	≥ 0.850
Confirmatory Fit Index (CFI)	≥ 0.800
Root Mean Square Error (RMSE)	≤ 0.050
Root Mean Square Error of Approximation (RMSEA)	$\leq 0,080$

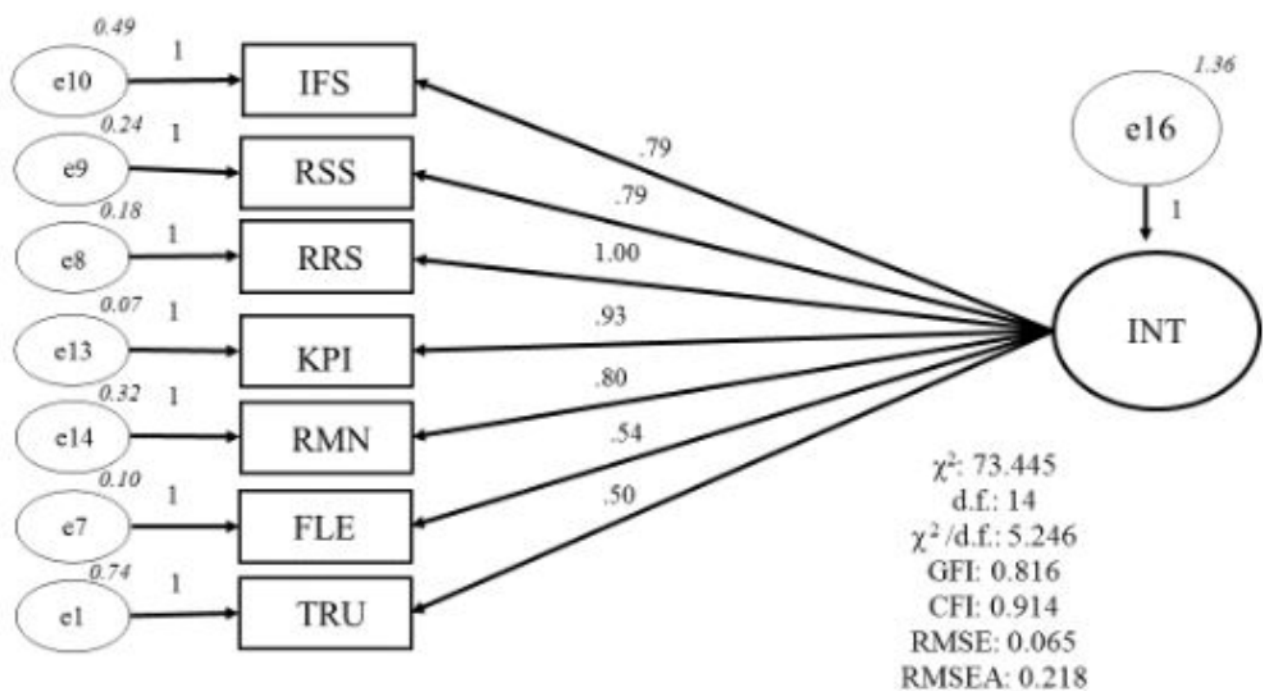
4. DATA DISCUSSION AND ANALYSIS

4.1 THE THEORETICAL INTER-RELATIONAL MODEL

It was developed a reflective type explanatory model (KLINE, 2011). It aimed to verify and assess the integration and collaboration in supply chains through their constructs and variables. Initially, the premise resided in the assumption that integration of the network would be explained by the collaborative and integrated practices between suppliers and buyers, as the constructs and variables previously defined. However, the SME model tested indicated a strong correlation between the dimensions integration and collaboration.

In order to guarantee the validity and reliability of the results, the constructs were submitted to more than one methodological procedure. This was done to minimize the occurrence of negative interference from the sample size or normality violations. Thus, the hypothesis that integration could be explained by the interrelation with the collaboration has generated a one-dimensional model (Figure 1).

Figure 1 - One-dimensional model Adjusted (M2)



Source: Elaborated by the authors, 2017.

Note (1): Information Sharing (IFS), Resource Sharing (RSS), Risks and Rewards Sharings (RRS), Key Processes Integration (KPI), Relationship Management (RMN), TRU (Trust), Flexibility (FLE); (2): Chi-square statistic (χ^2); Degrees of freedom (d.f.); Chi-square standardized (χ^2 /d.f.); Good Fit Index (GFI); Root Mean Square Error (RMSE); Root Mean Square Error of Approximation (RMSEA)

For this instance, collected data have been analysed using Principal Components Analysis (PCA) of Exploratory Factor Analysis. PCA reduce the number of variables in an attempt to eliminate the interrelated variables by transforming the system into a smaller system with fewer

number of correlated variables called principal components (PCs) or factors. Factor rotation was run to find variables that needed to be loaded maximally to only one factor and minimally to the remaining factors (FIELD, 2005). Varimax rotation with Kaiser normalization was used to clarify the factors (selfvalues greater than one). The varimax method was used on those cases where the FA extracted two or more values. (HAIR Jr et al., 2009). Percentage of total variance explained has been found to be more than 70%, which has been found acceptable for the principal component Varimax rotated factor-loading procedure (JOHNSON and WICHERN, 2002).

KMO and Bartlett's test of sphericity ($p < 0.05$) statistics have been used to test empirically whether the data have been likely to factor well (LORENZO-SEVA et al., 2011, FIELD, 2005, HAIR et al., 2009). The desired parameters for the results were KMO > 0.600 and Bartlett test significant (THOMPSON, 2004), Average Extracted Variance (AEV) > 0.500 and retention indicators with loads > 0.708 (Hair Jr., Hult, Ringle, and Sarstedt, 2013). Therefore, statistical tests showed that the dimensions of instruments have been seemed likely to factor well, as well as the questionnaire has been made multi-dimensional. Thus, the onedimensional model (Figure 1) with the integration scale produced better adherence, which means the average index variance explained 85.38% of the model. Still seeking greater adherence of the model to the reality of local relationships, in new round of EFA, those indicators whose factor loadings values were below 0.600, were excluded (THOMPSON, 2004). The same happened to those whose factor load were ≤ 0.5 , as well as those which factorial ambiguity and multicollinearity interitem were ≥ 0.850 . In the cases of multicollinearity, the criterion used for maintenance of the constructs was to keep those with the highest affinity to the originally proposed model, and excluding those with lower affinity. Consequently, the model was reduced from 14 to seven constructs, as shown in Figure 1.

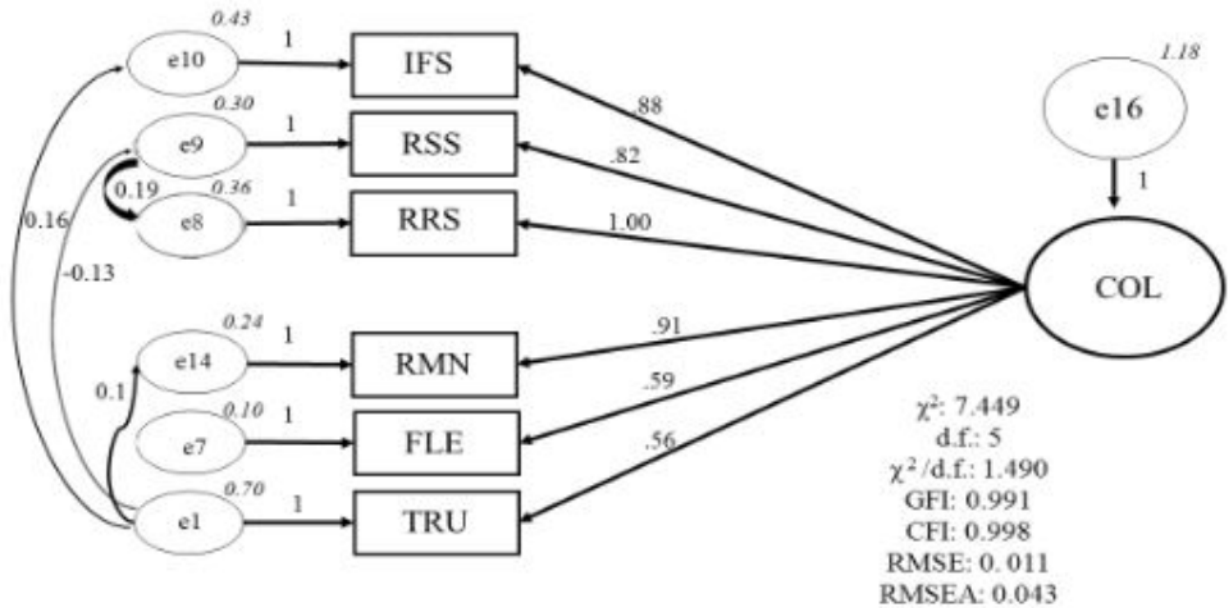
The new model produced satisfactory results in terms of convergent and discriminant validity. Only TRU construct (Trust) presented inter-item correlations with values lower than 0.500 fulfilling the most benevolent criterion (NETEMEYER, BEARDEN and SHARMA, 2003) and factor loadings lower than 0.708, which is not enough to reject the validity convergent, according to the most stringent criteria suggested by Hair et al., (2013). Therefore, it was considered satisfactory evidence of convergent validity. The criterion Fornell-Larcker (FORNELI and LARCKER, 1981) was used to examine the discriminant validity. In all cases, the validity of the constructs was greater than the highest correlation squared with any other construct. Thus, it was not found evidence of discriminant validity violation.

For nomological validity, it was accepted all the hypotheses theoretically suggested. This implies that the theoretical model was validated in terms of its setting and its explanatory power, through SME (AAKER and BAGOZZI, 1979; CHINTAGUNTA et al., 2006; BOLLEN, 1989; HAIR Jr., Hult et al., 2013; KELLOWAY, 1998). The method of Maximum Likelihood (ML), was used to support all assumptions in the model. Similarly, no variable showed a negative variance or any other deviation from normal.

Another improvement in the model was also obtained with modifications suggested by AMOS®, in order to improve the adjusted chi-square. Kenny (2012) explains that modification index suggest ways to improve a model, increasing the number of parameters such that the statistical chi-square falls faster than its degrees of freedom. This software has a legitimate place in exploratory studies, as in this case. However, in an attempt to improve a model, one should not be guided solely by suggested modification indexes. Modifications should be considered to make theoretical sense, not only as a servile dependence voted to produce an incorrect or absurd model, even with an acceptable value of chi-square (MACCALLUM, 1986; MACCALLUM et al., 1992). Under this premise, were incorporated foru more new covariance parameters to model ($e1 \leftrightarrow e10$; $e1 \leftrightarrow e9$; $e1 \leftrightarrow e7$; $e8 \leftrightarrow e9$), three of which include TRU construct relationships (trust) to other constructs.

The model has reached acceptable levels with these adjustments, especially Good Fit Index (GFI) greater than 0.850 (.883 was the index reached). This indicates that it is reasonably fit for our purposes. Intending to evaluate possible existing problems, that could have been preventing better rates, we teste the between the constructs INT and RRS, wich was 0.92. Thus, based on the practical interest for which the model is designed, we tested for deleting the INT construct and maintain RRS. Modifications improved as was envisaged, all adjustment levels (Figure 2). The new hypotheses, as well as the entered covariates were supported.

Figure 2 - - Improved model using the modifications suggested by AMOS (M4)



sSource: Elaborated by the authors, 2017.

Nota (1): Information Sharing (IFS), Resource Sharing (RSS), Risks and Rewards Sharings (RRS), Key Processes Integration (KPIC), Relationship Management (RMN), TRU (Trust), Flexibility (FLE);(2): Chi-square statistic (χ^2); Degrees of freedom (d.f.); Chi-square standardized ($\chi^2/d.f.$); Good Fit Index (GFI); Root Mean Square Error (RMSE); Root Mean Square Error of Approximation (RMSEA)

Table 6 shows the relevant contents of each of the tested models. This way, it allows to visualize the evolution of the model from its original design. The first column shows the desirable indices, which serve as parameters to fit the model.

TABLE 6- Measures used to assess the quality and fit of the model

CRITERIA	DESIRABLE PARAMETERS	MODEL 1	MODEL 2	MODEL 3	MODEL 4
Method	ML	ML	ML	ML	ML
NPAR	-	31	14	18	16
χ^2	-	396.765	73.445	42.540	7.449
d.f.	-	89	14	11	5
p-Value	>0,050	0.000	0.000	0.000	0.000
$\chi^2 /d.f.$	>1,000 <5,000	4.458	5.246	3.867	1.490
GFI	$\geq 0,850$	0.611	0.816	0.883	0.991
CFI	$\geq 0,800$	0.884	0.914	0.955	0.998
RMSE	$\leq 0,050$	0.044	0.065	0.033	0.011
RMSEA	$\leq 0,080$	0.197	0.218	0.179	0.043

Source: Elaborated by the authors, 2017.

4.2 CONSTRAINTS OF ATTRACTING STRATEGIC SUPPLIERS FOR LOCAL SUPPLY CHAIN

Different firms will have different conditions and expectations in order to bring or develop strategic local suppliers. The interviewed supply managers of the focal firms, regardless their nationality – American, Brazilian, Chinese, Korean, and Japanese - pointed out six major drivers for attracting strategic suppliers on electronics industry at the PIM. These conditions were: 1) regulation of basic productive processes; 2) production volume; 3) excessive bureaucracy; 4) deficiencies in logistics infrastructure; 5) lack of skilled labor, and 6) low density of Rand in PIM. As a result of the productive structure strongly seated in the assembly of ending electronic goods, combined with the scarcity of strategic suppliers of the global electronics industry in the PIM supply chain, value-added inputs are imported and the lower value added are produced by local suppliers as seen in the following speech fragments.

(American) “The imported inputs are the most representative. The volume traded with local suppliers do not reach 5% of the total cost of our products inputs.”

(Korean) “The participation is small, somewhere around 5% approximately. Most of our raw materials come from Asia.”

The global electronics industry's strategic suppliers require large-scale production to offset the high investments. In addition, the scales of production and the high utilization of productive capacity are essential to maintain the competitiveness of these enterprises. Considering the dependence and the large influx of imported inputs to meet the needs of production, excessive bureaucracy in import operations, in the view of respondents, undertakes the manufacturing operations of the surveyed focal companies and hinders the attraction of strategic suppliers for PIM.

(Korean) "The customs procedure of PIM needs to be revised, simplified. [...] The way it is, it gets complicated to bring strategic suppliers to Manaus."

(Japanese) "A lot of bureaucracy. It is an aside complicating factor, not only for our company, but for everyone. We have had many losses due to lack of inputs, many production stops, even, in some situations, we had to give clearance for employees of the production lines. "

The faulty logistics infrastructure identified as the fourth condition, certainly, is the most significant logistics adversity variable in which the PIM is inserted. It raises the cost of transport in both the resupply of raw materials and in the distribution of finished products to major centers the country's consumers. Thereby reducing the efficiency and responsiveness of the electronics supply chain sub-sector, and hinder the attraction of new suppliers for PIM.

(American) "[...] a shipment from China takes on average 45 days to reach Manaus [...]. The logistics infrastructure in the region is poor [...]"

(Chinese) "The logistics here is very bad, it represents so much in the final cost of the product. [...] In addition to the travel time that is long when the merchandise arrives, the landing still lasts for weeks, depending on the case. In China, before producing one thinks of the logistics to ship production. "

The production of strategic inputs for the electronics sector demands high levels of robotics and automation in order to achieve the necessary production scales and provide return on investment. Unlike the final assembly of electronic products that demand high use of hand operational labor, the production of strategic inputs requires the use of highly skilled labor, featuring the fifth condition appointed by supply managers interviewed.

(Brazilian) "technical high-skilled labor has always been a problem here in Manaus. Over the years, there was an improvement, but the problem continues."

(Chinese) "With our expansion, we began to have trouble hiring technical and skilled personnel. With the acquisition of our competitor, we took many of the engineers and technicians from there. Operating hand labor is not a problem, we have excess in supply. The shortage of skilled labor technique is a complicating factor for the development of our business. "

(American) "The branch in Manaus is a manufacturing plant. We have Rand in Manaus plant. The whole process of new product development is carried out in our research centers, mainly in those located in the United States. We have some research centers located in Europe, which are also important. "

(Chinese) "All our projects are developed in the headquarter. However, our engineers frequently travel to the company's HQ and our development centers to monitor the development mainly of

new products and process technologies. “ (Japanese) “Research and development has never been the focus of Manaus unit. Our company centralizes these activities in Japan, and other centers, such as Singapore and Malaysia. Our engineering team monitors the development of new technologies among these centers.

5. IMPLICATIONS AND CONCLUSIONS

This research discussed how leading companies manage relationships in supply chains that are not formed by natural market forces. Rather, they were stimulated by exogenous forces, such as the Free Trade Zones that are created by the Government's policy initiatives for purposes of regional development. This means that on one hand the companies settled for a location that they would not do under normal conditions and, secondly, that there was an expectation of externality as the makers of the strategy, in this case the public entity.

The basis for integration of the researched focal firms at PIM and their local suppliers in Manaus are Information Sharing (IFS), Resource Sharing (RSS), Risk and Return Sharing (RRS) Relationship Management (RMN), Trust (TRU), and Flexibility (FLX), which is the degree to which partners are able to adapt in order to attend to the needs of the supply chain. The constructs with non-significant values were key processes integration (KPI), Integrated Logistics (INL), and Supply Network Coordination (COO). They seem to suggest that a network was formed under the aegis of pragmatism and specific objectives, which makes the integration timely. There is a comprehensive cross-organizational integration, being able to even say that we have an integrated network but never coordinated. The concepts of integration can touch many of the critical elements of relationships in supply chain. Some integration definitions in supply chain context emphasize flows of materials and parts, others focus more on flows of information, resources and cash. However, among the constructs and variables studied, results indicated minor inter-organizational integration of the processes, such as integration of key processes (KPI), Integrated Planning (INT) and Joint Development (JND). The low value for trust (TRU), despite making up the profile, in addition to no significant coefficients for the constructs joint problems resolution (JRL) and joint learning (JNL) indicated that relational capital was less relevant. Considering that trust can also be perceived as goodwill, as an important form of relational capital, trust can be critical for mitigating opportunism and engendering cooperation among partners (Yeung et al., 2009; Wang et al., 2011). Tsanos, Zografos e Harrison (2014) performed an extensive review of the literature investigating the factors that are recurrently mentioned as antecedents of collaboration and they found trust, commitment, mutuality and reciprocity.

On the other hand, it became clear that coordination is not enough structured. Coordination is understood as the integration of physical flows and also represented by the coordination of decision-making among partners on operational processes and is labelled “coordination of operational decisions” (TSANOS et al., 2014). For example, if we consider the framework of the study presented in Cao and Zhang (2011), we can identify the presence of some constructs but not others in effective supply chain collaboration. In this framework there is a set of seven interconnecting dimensions that make up effective supply chain collaboration: information sharing, goal congruence, decision synchronization, incentive alignment, resource sharing, collaborative communication, and joint knowledge creation.

This aggregate result seems to indicate an earlier step in terms of maturity of the supply network. Spekman et al., (1998) defines this stage of relationships with suppliers of items of low complexity and low strategic importance, as they really are. According to Davis and Spekman (2004), there would be a shift from compliance to agreed responsibilities (in open-market negotiations), to commitment towards the SC member (in collaboration). Based on Kampstra et al., (2006), collaboration in this supply chain timidly rehearses its first step up. It is characterized by

the use of instruments of information and communication technology to facilitate communication and to disseminate information to increase productivity. They have the characteristic of unilateral decision of the head of the supply chain, the focal firms, which reflect established strategies and objectives of positioning their facilities in Manaus. The relational exchanges in the chain could offset the adversities of distance, even if the suppliers are not strategic and items are not complex. We can see that with local suppliers there is a level of integration to structure inter-organizational strategies, practices and processes into collaborative, synchronized processes (STANK et al., 2001). Thus, based on Flynn et al., (2010), who define integration in the supply chain as the degree to which a manufacturer strategically collaborates with its supply chain partners, we understand that the level of cooperation is low and sacrifices the integration and synchronization of inter-organizational processes.

Capaldo and Giannoccaro (2015) remembered the benefits associated with trust found in several industries and economic sectors and easily explained through different theories, most notably the transaction cost economics and the relational exchange theory. In strategic management studies, associated to performance outcomes such as improved flexibility, responsiveness, and cost reduction as well as trust stimulates partners to collaborate more intensively and to engage in risk-taking initiatives. Trust is one backbone of the strategic collaboration, which is an ongoing partnership to achieve mutually beneficial strategic goals, that engenders mutual trust, increases contract duration and encourages efficient conflict resolution and sharing of information, rewards and risks (FLYNN et al 2010). Besides all these potential benefits, focal firms showed they were not willing to consider both operational and strategic benefits of the relationships with local suppliers. Also even though dependent in relation to focal firms the supplier general performance could be improved deepening the integration in the supply chain through their trust on focal firms.

Curiously, besides the constraints of the local logistics, constructs of the logistics were not highlighted. Supply Chain Coordination (COO), Key Processes Integration (KPI), Integrated Logistics (INL), and Integrated Long, Medium and Short-Term Planning (INT) must mirror the focal firm devoted importance and willingness to integration. Mellat-Parast and Spillan (2014) understand that besides the complexity and involvement of multiple organizations that the logistics integration involves, managers should effectively utilize their resources and optimize their logistics and supply chain decisions to achieve competitiveness. The authors believe the first steps starts with information sharing and jointly planning.

Anyway, opportunities are lost and the model is weak for the host country. Su et al., (2011) emphasized the importance of relational capital, especially supplier relationship management and supplier development in achieving innovation and best practices. The current model has not created cumulative capabilities as well as competent suppliers do not have opportunities to develop in this environment. On the contrary, focal firms demonstrates indifference in logistics/supply chain process integration with suppliers, through effective integration in inter-organizational processes across logistics and supply chain activities, which usually has significant effect on firm competitive position (MELLAT-PARAST and SPILLAN, 2014).

Moreover, the lack of interest in implementing collaborative relationships with local suppliers ceases to contribute to the development of suppliers more competently. The trust emanating from the focal firms could be disseminator of the benefits already known, such as those highlighted by Huang and Wilkinson (2013), including: promoting a longer term orientation, increasing interdependence, cooperation, acquiescence, and commitment, facilitating the planning and coordination of activities by reducing uncertainty, conflict, and the risk of opportunistic behavior, promoting more honest and open communication, and compensating for a lack of information about future events, and reducing the costs of monitoring and control. As Braziotis and Tannock (2011), success formatting a supply chain depends on effectively assembling a network of companies that know how to collaborate, what also requires a fundamental change in the power configuration among the participant companies to enhance relationship commitment.

Of course firms need to employ different strategies to achieve a competitive advantage and this is dramatic when we consider global market options and the decisions of location. There are different contexts and circumstances to weight in the development process of a proper strategy to fit not only a single firm but many firms, such as the site competence and their relationships with site location factors and performance and the impact on operational performance, for example. Feldmann and Olhager (2013) characterized the contribution the plants to build the competitive advantage into three categories: some plants have only production-related competences, some have competences concerning both production and supply chain, and the third group of plants possesses all three bundles of competences. In the case of the firms studied, we identified plants having only production-related competences on cost efficiency and quality, but not new product introductions as predicted by their model. Next steps would advance in direction to supplier development, procurement and logistics supply chain, and introduction and improvement of both product and process.

Furthermore, Feldmann and Olhager (2013) suggest that competence reinforce themselves. So as the competences are cumulative the “lower” level competences (such as production, maintenance, and process improvement) are stronger when together with “higher” level competences (related to supply chain and development). That means plants with supply chain competences must have higher levels of production competence than plants with only production competences. Moreover, increase in the level of competence has a significant effect on cost efficiency, quality and the rate of new product introductions (FELDMANN and OLHAGER, 2013). Thinking about the reason that had attracted the firms to Manaus, cost efficiency could be more intensive if more competences were brought to the local (Manaus) as well as could directly contribute to the suppliers competence, as indicated by the rate of new product introductions.

So if the the choice of location is cost-driven the firm may be experiencing losses in the medium and long term, as well as firms that compound the supply network. Moreover, if we consider the situation under study, a public policy that directed resources to attract business, then we can understand that the policy is not sustained. It will not produce longterm results: will not generate strong local firms as well as can generate periodically spiral of demand for increases in tax benefits. Also suggests that it is more comfortable to public managers offer easiness such as tax incentives spiral than enhance other disabilities such as logistics issues and labor deficiencies. Once considered the strong impacts of the costs and the transactional level of relationship with local suppliers, the results did not qualify the cases for framework developed to discuss plant role on international strategy manufacturing roles, as proposed by Ferdows (1997) for example.

Acknowledgments: Funding for this project has been provided by the Fapemig, CNPq and CAPES. These institutional support is gratefully acknowledged.

CONSTRUINDO AS VANTAGENS ESPECÍFICAS DOS PAÍSES (CSA): COMPREENDENDO COMO A FTZ INCENTIVA O IMPACTO LOCALIZAÇÃO DA PLANTA ESTRATÉGICA E AS RELAÇÕES COMPRADOR-FORNECEDOR

ABSTRACT: Exploramos como as empresas líderes gerenciam relacionamentos em cadeias de suprimentos que não são formadas por forças naturais do mercado. Em vez disso, eles foram estimulados por forças exógenas, como as Zonas de Livre Comércio criadas pelas iniciativas políticas do governo para fins de desenvolvimento regional. Nós pesquisamos a indústria eletrônica em Manaus, localizada na Floresta Amazônica Brasileira. Multi-métodos usando entrevistas qualitativas, estruturadas e abordagens quantitativas, equação de modelagem estrutural, foram utilizados. Os resultados indicaram que as empresas optaram por um local que não fariam em condições normais e, segundo, que havia uma expectativa de externalidade como os criadores da estratégia, neste caso a entidade pública. A coordenação entre os membros não é suficiente estruturada. Nenhum fornecedor estratégico foi encontrado no FTZ local, indicando que os fornecedores locais são baseados apenas na premissa de custo de volume versus custo de logística.

Keywords: Zonas Francas, Brasil, Floresta Amazônica, Vantagens Específicas ao País

Originals recebidos em: 08/11/2018
Aceito para publicação em: 03/01/2019

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