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OPERATIONAL COMPETENCIES ROOTED IN RESOURCE THEORY: OPERATIONS STRATEGY AND SUPPLY CHAIN PERFORMANCE

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ABSTRACT

This study discusses the influence of internal and relational resources on the performance of purchasing companies in which strategic suppliers are involved in their business processes, through interaction with

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operational competencies. The discussion of competency development has followed an internal focus on the company influenced by the resource-based view. In turn, the relational view proposes strategies of interorganizational cooperation to develop competitive relationships through short- and long-term collaborative actions. This study fills an important gap in the field of resource theory in Latin America. The results show that relational vision categories, when integrated with operational competences, influence business performance.

Keywords: Supply chain management; Operational competences; Operations strategy; Resource-based view; Relational view

1. INTRODUCTION

Developing an economy in markets that are highly competitive, intensive volatility, and forced by competitive pressure requires a dynamic of adapting traditional approaches to business strategy. In the business environment, the strategy is about taking actions and allocating resources to achieve business goals. Among the concepts of strategy is related to the Operations Strategy that guides the search for competitiveness and highlights the role of manufacturing as decisive for adapting strategic resources and developing competencies to compete in competitive environments (Paiva, 2017).

Since the 1960s, several studies have promoted the development of business strategy concepts, for example, Chandler (1962). Also, in this decade, in 1969 began research in the field of Operations Strategy consolidating the studies of Skinner (1969), Swamidass and Newell (1987), Wheelwright (1984), Hayes and Wheelwright (1984), among other researchers, which highlighted the role of manufacturing as decisive for competitiveness. Production has come to be recognized as strategically important, and Operations Management has become more integrated with other business areas (Gresswell, Childe & Maull, 1998).

Evolving from a vision of operational decisions in line with the vision of strategic planning developed by, for example, Skinner (1969) and Wheelwright (1984), discussions about operating practices and competencies have recently emerged (Wu, Choi & Rungtsunatham, 2010, Wu, Melnyk & Swink, 2012), with origins in the resource-based view.

In a dynamic environment, sources of competitive advantage span the entire organization at various levels of business and operations, as well as between internal and external actors, requiring more integrated attention. Studies that address the evolution of business strategy (Vasconcelos & Cyrino, 2000; Peng, Schroeder & Shah, 2008) address this

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integration, recognizing the increasing complexity of the environment and the potential impacts on organizations, which requires an increasing focus on processes and resources (Teece, Pisano & Shuen, 1997; Vasconcelos & Cyrino, 2000) and operational competencies (Wu, Choi & Rungtsunatham, 2010).

In business practice, competency development is important for resource use, as competencies constitute a set of skills, processes, and routines that direct resource use. They are mechanisms by which human skills are leveraged to effectively use internal and relational resources that consequently reflect on process improvement and business performance (Voss, 1995; Narasimhan, Swink & Kim, 2005; Wu, Choi & Rungtsunatham, 2010).

Within the resource-based approach is the core of operations strategy that is based on distinct and intertwined elements, including tangible and intangible skills, practices, and resources. This synergy forms a convergence that reinforces the ability to influence the competitive environment (Wu, Melnyk & Swink, 2012).

In this context, it is relevant to understand that operational competencies represent the ability to promote a set of personal skills and tacit knowledge for the efficient use of resources, thus determining the limits of what can and cannot be done, as resources alone define potential use because they are passive and reactive, requiring them to be targeted (Wu, Choi & Rungtsunatham, 2010).

The existing literature presents a few studies with perspectives that associate resource and competency approaches. Internationally, much progress has been made in research on operational resources and process-oriented competencies in operations. In the early 1990s, Leonard-Barton (1992) mentioned that competencies are traditionally treated as groups of distinct techniques, skills, and management systems. However, competencies are deeply rooted in values, which constitute a critical dimension often overlooked by scholars.

In the Brazilian context, academia has evolved with studies in the field of resources and competencies. However, there is a gap in the literature (Grant, 1991; Barney, 1991; Peteraf, 1993; Wu, Choi & Rungtsunatham, 2010, Wu, Melnyk & Swink, 2012). In this context, the main objective of this study is to analyze which relational resources and operational competencies developed and/or shared in the dyad buying companies and strategic suppliers influence the operational performance of the supply chain of the buying companies.

2. THEORETICAL FRAMEWORK

2.1. Operations Strategy

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The Operations Strategy plays a decisive role in competitiveness that occurs from the interactions of the environment with this decision process and leads to superior performance. Performance measurement occurs through competitive priorities and structural decisions and infrastructures that develop operational competencies (Wheelwright, 1984; Paiva, 2017).

In this process, the production function and its operations also play a decisive role in adapting companies' strategic resources to the competitive environment. In this context, the production area is now recognized as strategically important, and operations management has become more integrated with other business areas (Gresswell, Childe & Maull, 1998).

The strategic role that the production function obtained from Skinner's (1969) work determined a hierarchical structure of strategies, most commonly practiced at decision levels (Swamidass & Newell, 1987; Hill, 1997). Production involves decisions in various areas of the company. Developing an operations strategy involves making a set of decisions about the structure and infrastructure of operations (Skinner, 1969; Hayes & Wheelwright, 1984).

2.2. Competitive performance

Competitive performance is a field of study in operations strategy research for competitive positioning - competitive success stemming from the organization's managerial competence - through five industry competitive strengths or priorities, as well as their differentiating capabilities.

Competitive priorities are criteria that manufacturing systems can adopt as a consistent set of performance dimensions to meet manufacturing (Skinner, 1969), thereby enhancing and maintaining the competitiveness of business and corporate units and structural and infrastructural decisions (Wheelwright, 1984; Paiva, 2017).

Notably, some authors have defined some competitive performances: Frohlich and Dixon (2001), Frohlich and Westbrook (2002): quality, cost, delivery, and flexibility; Jiménez and Lorente (2001): cost, time, quality and after-sales, and report the need to include environmental performance as a new competitive performance; Dangayach and Deshmukh (2001): cost, quality, delivery reliability, and flexibility.

The studies of Swamidass and Newell (1987), Cleveland, Murphy and Williamset (1989), Ferdows and De Meyer (1990), Roth and Miller (1992), Vickery, Droge and Markland (1993), Vickery, Droge, and Markland, (1997), Ward, Leong and Boyer (1994), Bozarth and Edwards (1997), Flynn, Schroeder, and Flynn (1999) and Rosenzweig, Roth, and Dean (2003)

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all refer to competitive performance as quality, cost, delivery, and flexibility, most present in the operations strategy literature.

The consolidation of environmental practices as a competitive performance is still a hotly debated topic (Pagell, Wu & Wasserman, 2010; Parmigiani, Klassen & Russo, 2011; Paulraj, 2011). The choice of the company's competitive performance varies according to the different competitive strategies determined, and there is no universal consensus on which performances, alone or together, should be adopted.

Therefore, Ferdows and De Meyer (1990) argue that the most competitive companies can achieve higher performance standards than the competitors in which they adopt all competitive priorities, compared to those who adopt an optimal sequence of competency development simultaneously cumulative. For example, adopting priority sequencing: first develops quality, then delivery reliability, flexibility, and finally cost. According to Flynn and Flynn (2004), this sequence of accumulation of competencies may change due to external factors related to the competitive environment as factors inherent to the company's country of operation

2.3. Structural and infrastructural decision areas

Developing an operations strategy involves making a set of decisions about the structure and infrastructure of operations (Skinner, 1969; Hayes & Wheelwright, 1984). Manufacturing structural decision areas relate to capacity, facilities, technology and equipment, processes, and vertical integration. The more tactical infrastructural decision areas encompass a set of continuous decision support policies, procedures, and practices, such as human resource management, quality management, production control, and physical arrangement (Hayes & Wheelwright, 1984) and influence workforce (Hayes et al., 2008), supplier relationships, and new product development (Fine & Hax, 1985; Paiva, Carvalho Jr. & Fensterseifer, 2009), and environmental management (Angel & Klassen, 1999).

2.4. Supply Chain Management Business Processes

According to Davenport (1994), business processes are defined as a set of structured activities, designed to produce a specific result, constituting a structure of activities designed to perform an action focused on end customers and the dynamic management of flows involving products, money, knowledge and/or ideas (Lambert, Cooper & Pagh, 1998).

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In the supply chain, a process can be understood as a structure of activities designed to perform an action focused on end customers and the dynamic management of flows involving products, money, and knowledge (Lambert, Cooper & Pagh, 1998).

Lambert and Cooper's (2000) supply chain management model considers three interrelated elements as critical antecedents for managing a supply chain: (i) the supply chain structure, which consists of the set of member companies and the links between these companies; (ii) business processes, which are the set of structured activities that produce a certain value output for customers; and (iii) management components that are the management variables by which business processes are integrated and managed throughout the chain (Lambert & Cooper, 2000).

Following the key definitions of implementing key supply chain processes that require integration, Lambert and Cooper (2000) present eight business processes as determined by the Global Supply Chain Forum (GSCF): (i) customer relationship management; (ii) customer service management; (iii) demand management; (iv) order fulfillment; (v) production flow management; (vi) relationship management with the supplier; (vii) product development and marketing; and (viii) return management.

The customer relationship management and supplier relationship management processes constitute the critical links in the supply chain and each of the other six processes is coordinated through them. Each of the eight processes is multifunctional, being used within the company and inter-organizationally between members of a supply chain (Lambert, García-Dastugue & Croxton, 2005).

2.5. Resource-based view

The resource-based view seeks to understand how heterogeneous resources and competencies differentiate high performers from underperformers and sustain a competitive advantage, and consider competitors' above-average performance as a phenomenon primarily due to characteristics peculiar internal aspects of the organization (Vasconcelos & Cyrino, 2000). Resources are defined as tangible and intangible assets controlled by a company. Resources are used to implement strategies, meaning a company's ability to employ them dynamically (Barney & Clark, 2007; Barney & Hesterly, 2011).

From this perspective, dynamic aspects of competition, accentuating phenomena such as innovation, discontinuity, and economic imbalance can determine whether competitive advantage can be sustained for a given time. This means that the company must continually

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control its strategic resources so that if current resources become obsolete, new arrangements ensure superior performance and competitive advantage (Barney, 1991; Prajogo & Mcdermott; Goh, 2008).

According to classical theory, resources classified as rare, imperfectly mobile, imitable and irreplaceable are apt to exploit opportunities or neutralize threats and have the potential to generate competitive advantages when they combine the understanding of strengths and weaknesses through the VRIO (Value, Rarity, Imitability, and Organization) (Barney & Clark, 2007; Barney & Hesterly, 2011) which offers four issues that should be considered in this analysis, i.e. the resource must have value to enable the company to exploit an environmental opportunity and/or neutralize it. an environmental threat, must be Rare, that is, controlled only by a small number of competing companies, must be Impersonal, as companies without the resource face a cost disadvantage to obtain or develop and must be Organized, that is, endowed with policies and procedures to support the exploitation of valuable, rare and costly resources to imitate.

2.6. Relational View and Chain Relationship Structure

While the resource-based view develops the idea that a company's competitive position is defined by an internally accumulated resource bundle (Rumelt, 1984; Barney, 1991), the relational view presents a view that a company's competitive position or the creation of Value in relationships can be defined by resources and strategic competencies combined in interorganizational relationships.

The relational view advocates that a company's critical resources can be shared in inter-organizational relationships to achieve higher than average returns on competition and create a sustainable competitive advantage (Ingham & Thompson, 1994; Dyer & Singh, 1998; Combs & Ketchen 1999; Das & Teng, 2000; Mosque, Anand & Brush, 2008).

Interorganizational relationships are important units of analysis because they provide an understanding of competitive advantage, whose impacts are determined by the combination of resources, which involve physical assets, knowledge and learning, and complementary resources that can contribute to related income creation and operational performance. of the supply chain (Dyer & Singh, 1998). Relational income is obtained through four potential sources (Dyer & Singh, 1998; Combs & Ketchen, 1999; Lavie, 2006): (i) investments in relationship-specific assets; (ii) substantial exchange of knowledge that results in learning; (iii)

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combination of complementary resources; and (iv) lower transaction costs introduced by effective governance mechanisms (Dyer & Singh, 1998).

The relational view also focuses on sharing high levels of trust and formal reporting, and monitoring relational control actions achieved (Dyer & Singh, 1998; Zacharia, Nix & Lusch, 2011). Because of this, in the supply chain theme, the relational view can complement the other theoretical approaches, such as the collaborative relationship, highlighting the possibility of sharing relational resources in favor of high performance to obtain a sustainable competitive advantage.

2.7. Operational Skills

Recent studies have analyzed aspects of Operations Strategy from a perspective that shows more consistency in strategic decisions in operations, based on resources owned or controlled by a company (Paiva, 2017). This category includes studies by Wu, Choi, and Rungtsunatham (2010, 2012). The Operations Strategy is centered on three closely related concepts to establish its strategies, and there is a tendency to confuse them. These concepts are: (i) operational skills; (ii) operating practices; (ii) and the resources.

Regarding that, the Operations Strategy has as its origin the result of operational skills developed from interaction with resources (Hayes & Pisano, 1996; Tracey, Vonderembse & Lim, 1999) and unique operating practices (Peng, Schroeder & Shah, 2008; Wu, Choi & Rungtsunatham, 2010).

Based on the resource-based view, operational competencies are paramount for developing the company's competitive advantage individually and relationally, thus developing what might be called relational operational competencies (Zatta, 2015). Organizational skills represent a superior and distinctive way of deploying and allocating resources. Without organizational skills, a resource may lose its value over time because it could not be put to use.

While organizational competencies focus on the ability to manage a process or intellectual property, resources are the actual factory, brand, or patent (Coates & Mcdermott, 2002; Wu, Choi & Rungtsunatham, 2010). Organizational skills can be purposely built and accumulated (Skinner 1969) by focusing on the complex interactions between a company's resources that are not easily imitated, duplicated, acquired, or replaced (Dierickx & Cool, 1989; Amit & Schoemaker, 1993), deeply rooted in their unique social structure (Schreyogg & Kliesch-Eberl, 2007).

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Operational skills are a subset of organizational skills, the purpose of which is to enable the company to make full use of the resources it owns or controls. That is, competencies alone do not allow a company to implement its strategies, but allow it to use its resources to implement its strategies. Wu, Choi, and Rungtsunatham (2010) define operational competencies as company-specific skill sets, processes, and routines developed within the operations management system, which are regularly used for problem solving through operational resource configuration, and constitute the “secret ingredient” to explain the development of competitive advantage.

Competencies are distinctive in that they create a barrier to imitation, a potential source of competitive advantage, and can provide an explanation of variations in operating performance (Grant, 1991; Barney, 1991; Peteraf, 1993). Operational competencies have high validity in predicting operational performance results based on the competitive performance of cost, quality, delivery, and flexibility manufacturing (Wu, Choi & Rungtsunatham, 2010).

Based on the Operations Management literature, based on the initial study by Swink and Hegarty (1998), Wu, Choi, and Rungtsunatham (2010) developed a taxonomy of six operational competencies within the context of product differentiation aimed at providing a theoretical framework to guide their operationalization to solve business problems (Table 1).

Table 1: Taxonomic Synthesis

Operational skills		Authors
Operational Improvements	They occur to incrementally enhance and enhance current operational processes and can contribute to the organization's innovation process.	Swink and Hegarty (1998); Peng, Schroeder and Shah (2008)
Operational Innovations	They occur through radical improvements to existing operational processes or the creation of new unique processes.	Swink and Hegarty (1998); Peng, Schroeder and Shah (2008)
Operational customizations	Designed for knowledge creation and customization of operational processes.	Wheelwright and Hayes (1985); Schroeder, Bates and Junttila, (2002)
Operational Cooperation	Refers to the ability to develop stable relationships with internal functional areas and supply chain partners.	Swink and Hegarty (1998); Droge, Jayaram and Vickery (2004); Escrig-Tena and Bou-Llusar (2005)
Operational responsiveness	Refers to the ability to react quickly and easily to internal and external changes.	Upton (1994); Swink and Hegarty (1998)
Operational Reconfiguration	Refers to the ability to perform the transformation necessary to restore the fit between operations strategy arising from environmental contingencies.	Teece; Pisano; Shuen (1997); Swink and Hegarty (1998); Pandza, Polajnar, Buchmeister and Thorpe (2003)

Source: Authors.

2.8. Supply Chain Collaboration

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Cao and Zhang (2011) point that collaboration between companies that are part of the chain improves the performance and competitive advantage of the participants in a positive gain situation, which allows competition with other chains. The advantage of collaboration and the benefits achieved are directly related to knowledge exchange, resource sharing, and competencies with unique characteristics related to long term relationships. In addition, chain collaboration is viewed as a business process in which partners share information, resources, and risks to achieve common long-term goals.

Collaboration is a key factor where the various links in the supply chain depend on the integration of key business processes with multifunctional activities, ranging from raw material sourcing, processing, and distribution, in a continuous process throughout the network (Cooper, Lambert & Pagh, 1997).

Within an advanced business concept, collaboration provides a boundless cultural environment, with the primary objective of achieving competitive advantage through business process excellence and market expansion (Kumar & Banerjee, 2012). Thus, collaboration enables companies to achieve differential performance, such as accessing resources and routines that reside among the various supply chain members, enabling them to develop new products faster, with better quality and lower costs throughout the supply chain supplies, as well as meeting faster deadlines and better customer service (Kumar & Banerjee, 2012; Fawcett, et al., 2012; Vaidya & Hudnurkar, 2013).

2.9. Performance in the focus firm and supplier link

Performance appraisal is important because it allows managers to diagnose and understand the causes of problems and monitor the performance of areas and processes to verify that the parties have performed their responsibilities satisfactorily. Aragon, Scavarda, Hamacher, and Pires (2004) mention that there is no clear evidence that there are significant performance measures that span the entire supply chain, but measures that span part of the chain, such as some of their links (Lee & Billington, 1992; Mentzer et al., 2001; Pires, 2004).

Since performance measures are adopted considering several approaches. For example, Barney and Hesterly (2011) suggest an approach focused on economic and financial performance. Neely (1999) argues that financial measures have a short-term view, and thus lose relevance to underpin a global supply chain strategy (Green, Mcgaughey & Casey, 2006). According to Wu, Choi, and Rungtsunatham (2010), performance is measured through operational and financial indicators.

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Supply chain performance measurement systems use metrics that encompass qualitative and quantitative criteria listed in different assessment categories to quantify the efficiency and the efficacy of an action (Neely, Gregory & Platts, 2005). Measures and metrics are not only limited to objectively measuring performance, as they are also related to policies, emotions, and various other behavioral issues (Gunasekaran & Kobu, 2007).

More recently, research has focused efforts presenting studies related to business collaboration and supply chain management operations based on the assumptions of the resource-based view (Charan, 2012). Other research has attached importance to collaboration and the chain's competitive advantage considering the relevance of adopting performance appraisal multicriteria (Vaidya & Hudnurkar, 2013), and the relevance of cultural alignment between buyers and suppliers to maintain collaborative relationships (Cadden, Marshall & Cao, 2013).

3. METHODOLOGY

An advantage of using mixed research methods is that it avoids the weaknesses of a particular method (Mangan, Lalwani & Gardner, 2004; Boyer & Swink, 2008; Carter, Sanders & Dong, 2008). Thus, in the qualitative research stage, we have conducted four exploratory and interpretative case studies (Godoy &; Balsini, 2006; Yin, 2010; Barratt, Choi & Li, 2011). The companies studied in the qualitative stage are part of the manufacturing industry. We have used variables validated by the theory of relationship concepts, collaboration, resources, operational competencies, and supply chain performance were collected.

The qualitative research encompasses four distinct sectors: the steel industry, manufacturing of automotive and industrial application products, pulp manufacturing, manufacturing, and application of flexible tubes for the power industry. And these sectors have economic relevance and employ a large contingent of labor. The choice of sectors and industrial companies from different sectors is due to the interest in identifying complexity issues of the phenomenon investigated in each case (Eisenhardt, 1989), as well as making comparisons in order to identify convergences and divergences between the cases in view of the specificities of each segment (Eisenhardt, 1989, Meredith, 1998). At this stage, a survey was conducted using the chemical sector survey, which, in addition to exploring concepts of relationships, collaboration, resources, operational competencies, and supply chain performance, investigated the contribution of two operational practices to competency building.

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The use of mixed methods involved semi-structured interviews and also the collection of quantitative data through the adoption of the survey. The use of different procedures offers the possibility to explore more broadly textual and statistical analysis to answer research questions by analyzing different questions or levels of analysis units (Creswell, 2007). The treatment of qualitative research data was done through content analysis according to Bardin (2007) and Collis and Hussey (2005). Content analysis is a general analytical procedure that includes the use of data interpretation and coding techniques to transform texts into numerical variables that enable quantitative data analysis.

In the qualitative stage, it was decided to work with the strategy of study of multiple cases, in order to obtain answers deemed more appropriate in alignment with the research questions and thesis objectives. Barratt, Choi, and Li (2011) report that, in operations management, qualitative case studies increase external validity and protect against possible biases of the researcher, and in particular, favor the effects of theory building, as multiple cases are likely to create more robust and testable theories against single case research (Eisenhardt, 1989; Yin, 2010).

From content analysis, three key categories of analysis were defined according to the characteristics studied. These categories are: (i) Characteristics of the relationship with the strategic supplier; (ii) Relational resources and predominant operational competencies; and (iii) Improved competitive performance in the target company.

In the quantitative phase, the methodological procedure adopted was a cross-sectional analytical survey, performed at a single moment in time, whose cause and effect are investigated simultaneously. The deductive scientific method was adopted (Hair et al., 2009). In this type of survey, data collection is performed in order to test the adequacy of constructs and variables extracted from the literature related to the studied phenomenon, to test hypotheses of a causal relationship between variables (Malhotra; & Grover, 1998; Miguel, 2010).

To measure the constructs, the seven-point Likert scale was adopted, with extreme meanings, to indicate the extent to which respondents agree or disagree with each question. The main vehicle for administering the survey was Google Docs provider's online questionnaire administration software and tool.

For data analysis, an association was first made between the specific objectives with the sections of the applied questionnaire and the research hypotheses presented in the previous section. Secondly, statistical tests were performed by descriptive analysis. For categorical

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variables, the interval estimation for the sample proportions was a confidence interval for the maximum likelihood estimator of *p*, by the F-distribution to detect the groups that differed (Leemis & Trivedi, 1996).

The study of the relationships between the sections of interest of the questionnaire was performed by calculating Spearman's correlation, and the null hypothesis was tested by correlations at a 5% significance level ($p < 0.05$). Such test is recommended for variables that do not follow a normal distribution and for those categorical variables, as in the case of this study, where the variables were arranged on a Likert scale because they represent attributes.

Finally, aiming at a joint analysis of the results (Yin, 2010), we sought to understand which resources and operational competencies developed and / or shared between focus companies and strategic suppliers influence the operational performance of the supply chain on the enterprise-side. focus, based on the collaborative relationship. Overall, respondents defined strategic suppliers as those who are the primary source of supply for strategic, high-impact, highly complex, and poorly available market raw materials. These suppliers are, concerning the supply of raw materials, in most companies (3/4), the only source of supply. When it comes to high turnover and strategic materials and inputs, they can be a second source or multiple sources of supplies.

4. RESULTS AND DISCUSSION OF THE QUANTITATIVE STAGE

Survey results provided evidence of significant relationships between investment in specific assets and flexibility performance. There are associations between making investments in equipment and production capacities made by strategic suppliers and items related to companies 'ability to adjust production volumes to meet market-imposed changes and companies' ability to effect large-scale radical changes. These assets are realized when there is a guarantee of a high return on the investments made.

As for the sharing of information and knowledge that generate learning, the result of the correlations evidenced significant relationships with the quality and flexibility performances. As for the development and/or sharing of resources, capabilities, or complementary skills, the result of the correlations showed significant relationships with cost and quality performance. These relationships relate to the influence of resource mix, such as logistics skills to jointly develop and distribute products.

Through interviews, it was found that the partnership provides companies with benefits that go beyond providing, for example, knowledge absorption, product co-development, and

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process improvement. The interviews also showed that companies establish predominantly long relationships with their strategic suppliers, with relational characteristics. However, it was found that the adoption of transactional mechanisms governed through contracts to guarantee, mainly, the supply of raw materials, and this occurs primarily when there is only one supplier.

In the qualitative stage, it was also possible to verify that, in the companies of the studied sectors, the strategic suppliers are involved in value activities in the business processes of the focus companies, besides the supply. The most common value activities identified in the qualitative interviews were process improvement in manufacturing, engineering and process development, production planning, cost reduction processes, order tracking, time management, new product development, inventories, and product manufacturing.

The interviews also showed that in the sectors studied, strategic suppliers have greater bargaining power than focus companies, mainly due to the power of supplying scarce resources in the market. In addition, there were investments in specific assets made by some suppliers, non-strategic from the point of view of raw material supply, expanding production capacities, equipment, industrial facilities, and power supply systems.

The qualitative stage of the research also revealed that the most common determining factors identified in the interviews that warrant investments in specific assets are the volume of production and the long-term relationship in which trust and reputation are vital. Also, as far as knowledge exchange is concerned, it only occurs on the supplier side for companies in troubleshooting operational problems, training for new operations and maintenance, process improvement, and product and material development. Concerning the transfer of personnel between the companies and their suppliers, the interviews revealed that 75% of the companies corroborated the prescriptions of the model proposed by the relational view, with the exchange between both partners, from the supplier to the client company and from the client company to the supplier.

In qualitative and quantitative research, the taxonomy of operational competences proposed by Wu, Choi, and Rungtsunatham (2010) involved five indicators: continuous improvement, innovation, customization, cooperation and integration, and rapid market response was confirmed. It was evidenced that the companies of the studied sectors differ in operational competences, considering their application to the specific problems of each company.

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These competencies developed and/or shared between companies and strategic suppliers have been found to play an important role in competitive performance as they establish an empirical link between resources and operational performance of the supply chain. In the qualitative stage, it was evident that companies in the sectors studied differ in operational competencies, considering their application to the specific problems of each company.

Another finding of qualitative research relates to the gain arising from tax benefits from special regimes granted by the federal and state governments. Thus, it is understood that a tax benefit, indirectly, can be conceptualized as a relational physical resource, as it maintains similarity with a capital resource, being this resource constituted by an external source of capital that are the government entities (Zatta, 2015).

5. RESULTS AND DISCUSSION OF THE QUANTITATIVE STAGE

In the quantitative stage, the result of the correlations showed significant relationships between the operational improvement competency and the cost, quality, delivery, and flexibility performances.

The following relationships were obtained: (i) performance of strategic suppliers in our corporate production process by training employees to develop new forms of production and improvements in operational processes involving equipment, machinery, and tools with cost performance items; (ii) development by strategic suppliers of new forms of production, acting in the production process of the focus companies with the item indirect production costs including operational supervision of cost performance; (iii) making continuous improvements in the production processes of the focus companies through cross-functional teams of the companies and the teams of strategic suppliers with the item indirect production costs including operational supervision of cost performance; and (iv) knowledge sharing among teams of focus companies and strategic suppliers to reduce waste and eliminate unnecessary activities in the processes was confirmed with the quality item related to the durability or resistance of the products according to expected service life.

Knowledge sharing was also related to quality performance, delivery time, and the ability of manufacturing to strategize to adapt and apply technology so that there is product differentiation with new opportunities to drive radical change on a large scale, if ever using employee skills to use different resources and competencies to develop new products.

Regarding operational customization competence, it was observed that most companies develop proprietary products, materials, and processes in their technology centers.

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Nevertheless, interviews on the complementarity of resources showed that most companies develop their own technologies and innovations, and some with strategic suppliers, with emphasis on automation processes, equipment configuration in lines, cells, modularization, and maintenance policies.

It was noticed, by analyzing the intersection between the information reported by the interviewees and the literature, that the aspects related to the development of proprietary technologies give companies advantages competitions with suppliers that depend on the accumulated knowledge of their collaborators during the customization process.

The development of competencies and skills of employees plays a major role in maintaining and improving equipment and processes considered unique, especially for those that are fundamental to the business, assessed as a source of sustainable competitive advantage.

Operational customization competency showed significant correlations with cost and flexibility performance. In the correlation analysis, it was found that relationships occurred when focus firms encourage teamwork to facilitate knowledge sharing and transfer between enterprise teams and strategic supplier teams, which influenced the performance cost, and total cost of production (includes the acquisition of raw materials, inputs, installation, maintenance, services, and others) of the focus companies.

In the analysis of cooperative operational competence, it was found that, in addition to the ability of companies to share data and information across functional areas, it was found that companies have shared competencies with suppliers and customers in their supply chains to leverage resources and knowledge from these external actors, including competitors on operational and strategic matters. It was found that in the companies studied, the existence of good relationships, both among internal multidisciplinary teams, as well as with strategic supplier teams, results in specific forms of supply chain management more effectively. Another finding of the research was regarding the relationship with competitors.

The interviews revealed that various strategic and operational information is exchanged, such as the exchange of product-related information, new entrants, pricing, and concerns about possible changes in the external environment. Respondents revealed that cooperation enables the coordination of production processes and promotes the expansion of operational capacity. Sharing information with suppliers to address inaccuracies and uncertainties through face-to-face meetings and technology channels on sharing information about products, volumes, and markets.

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Regarding labor, this was in all cases considered a strategic issue as it constitutes a large portion of the fixed cost. It was realized that the value chain of companies is involved in complexity factors that can interfere in the delivery processes of products to customers. Thus, hierarchical levels must update and execute their action plans with immediate communication of what has been planned to managers of higher levels, to control the achievement of goals.

In the analysis of operational responsiveness to market responsiveness, it was found that responsiveness is a relational competence that companies seek to share with their suppliers and customers to manage unforeseen issues considered crucial for supply chain performance. By the correlation test, no significant relationships were observed between the fast response operational competency and the evaluation of operational performances.

Additionally, in qualitative research, we sought to analyze the contribution of quality operational practices and product development to the formation of operational skills for improvement, customization, cooperation, and rapid response. The result of the correlations showed significant relationships between the variables.

Regarding product development practice, the result of the correlations showed significant relationships between this practice with items of operational improvement competencies to reduce waste, product customization, and with all items of rapid market response operational competency and operational cooperation.

Regarding the competitive delivery performance, in the qualitative stage, it was possible to identify that in the studied sectors, the focus companies attach greater importance to this performance with their strategic suppliers. In the maximum value scale of seven points, the value of six points was attributed, being the competitive performance that most contributes to the positioning of companies in relation to competitors.

As for the quality of competitive performance, this was the second competitive performance that most contributes to companies' positioning in relation to competitors. The company in the pulp sector was the one that attributed importance to this performance, followed by companies in the steel, flexible tubes, and automotive applications sectors.

As for cost competitive performance, this was the third competitive performance that contributes to companies' positioning in relation to competitors. The company in the steel industry attributed greater importance, followed by companies in the automotive and flexible pipe applications and pulp sectors.

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When observed the competitive performance of flexibility, was the fourth competitive performance that contributes to the positioning of companies in relation to competitors.

Identifying performances with values above four points on the scale supported companies' positioning against competitors, ranking them as excellent or much better than competitors. Therefore, these results corroborate the works Dyer and Singh (1998), by Wu, Choi and Rungtsunatham (2010) and Cao and Zhangh (2011), who report that relational resources and operational competencies developed and/or shared in collaborative relationships play an important role in influencing supply chain operational performance.

6. CONCLUSIONS

From a theoretical point of view, this study contributes to filling an important gap related to the understanding of the influence of operational process-oriented competencies on operations, on supply chain performance. With regard to operational competencies, we present a contribution to operations strategy researchers, who focus on points involving operational practices and tangible resources. Thus, an important contribution is in providing insight into which resources and which operational competencies influence supply chain operational performance, as well as providing support for examining the types of operational competencies that support the use of a specific resource.

The survey applied in the chemical sector, which aimed to verify causal relationships between relational resources and operational competences on the operational performance of the supply chain, allowed to evaluate the proposed research model and to test the research hypotheses proposed in the quantitative phase, which identified the influence of relational resource constructs and operational competencies on the operational performance of operations management.

The investigations presented some limitations and future opportunities. The limitations of the research relate to the following aspects: In relation to case studies, the research was conducted in four companies. And for this reason, even with the deepening of the knowledge obtained, it is not possible to generalize the research to the investigated sectors, as well as to other companies within these sectors.

Another limitation refers to the cross-sectional character, in which the research was conducted in a single moment in time, not allowing to verify possible changes and/or evolutions of the companies, as a result of the evolution of their physical and non-physical resources, operational skills and competences. Thus, given that supply chain relationships are dynamic,

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further research can be conducted by adopting the longitudinal approach. Thus, new research can apply the research instrument to larger samples seeking greater consistency for the generalization of results.

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