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**PROJETO: *Capabilities* operacionais e desempenho de mercado:  
Avaliação sob a ótica da capacidade absorptiva e processos gerenciais**

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**The project generated a paper “Evaluation of Market Performance under the Operational Capabilities, Absorptive Capacity, and Management Processes” that was approved and presented on 9th Conference on Performance Measurement and Management Control - Nice, France - September 13–15, 2017.**

### **Abstract**

The purpose of the paper is to contribute both to the operations literature and to the management accounting literature with the debate about what dimensions of operational capabilities, absorptive capacity, and management control better explain the variability of market performance.

For investigating the phenomenon, we used the quantitative methodology based on survey instrument for collecting data. The sample was composed of 63 companies from auto parts and food industries from Brazilian market. For analyzing those constructs, we use several statistic techniques such as ANOVA test, confirmatory factor analysis (CFA) and structural equation modeling (SEM) through Smart-PLS. The results showed that operational capabilities have influence on performance, and the realized absorptive capacity (RAC) indirectly impact on performance through cost control. The cost control also has the relevant impact on customer satisfaction, but not in business performance due to the value appropriated by a powerful customer.

The limitation of the study is that not all operational capabilities dimensions as well as of the absorptive capacity, and management control are covered in this work and not all forms of performance evaluation. Additionally, as we received few responses from the two focus sectors of the research, we could not compare them.

The practical implications of this paper are to deepen the analysis of the relationship between operational capabilities, absorptive capacity, management control, and performance in sectors that face fierce competition and in an adverse scenario.

**Keywords:** Operational Capabilities, Market Performance, Absorptive Capacity, Management Processes

## 1. INTRODUCTION

The literature has discussed these relationships partially, but there is still controversy when the construct is performance. Partly because of the multidimensionality of the performance construct which must be seen from different perspectives (Kafetzopoulos & Gotzamani, 2014). In addition, the relationship between operational capabilities and performance (Flynn, Wu, & Melnyk, 2010; Henri, 2006; Schroeder, Bates, & Junntila, 2002; Swink, Narasimhan, & Kim, 2005; Wu, Melnyk, & Flynn, 2010; Yang, 2013), absorptive capacity and performance (Brown, 1997; Cohen & Levinthal, 1990; Fosfuri & Tribo, 2008; Jansen et al., 2005; Zahra & George, 2002), and management control and performance (Chenhall, 2003; Govindarajan & Gupta, 1985; Marginson, 2002; Nisiyama, Oyadomari, Chen, & Aguiar, 2016) need further research to better explain these relationships. This view is supported by Swink et al. (2005) who understand the relationships between capabilities, operational practices, and performance are not well solved in the literature.

The controversy arises when some scholars believe that the operational capabilities improve performance (Flynn et al., 2010; Henri, 2006; Schroeder et al., 2002; Swink et al., 2005; Wu et al., 2010; Yang, 2013). Others researchers argue that the improvement in performance is due to the absorptive capacity (Brown, 1997; Cohen & Levinthal, 1990; Fosfuri & Tribo, 2008; Jansen et al., 2005; Zahra & George, 2002). Therefore, in the face of these divergences, there is space to analyze these relationships better. Consistent with this view, Schroeder, Bates, and Junntila (2002) who prefer to credit the impact on manufacturing performance as a result of increased operational capabilities when incorporating both external and internal learning. In this sense, investigating how performance can be improved is still an open issue in the literature of both operations (Swink et al., 2005) and management accounting (Van Veen-Dirks, 2005).

In this work, the performance will be evaluated from the market performance perspective, which consists of a set of commercial dimensions such as return on investment (ROI), profitability, sales, market share, customer satisfaction, among others (Tatikonda & Montoya-Weiss, 2001; Thieme, Song, & Shin,

2003). These dimensions are focused on monitoring business performance considering both financial and non-financial measures.

Based on the discussion above, it is observed that the organizational competencies, which reinforce the construct under analysis (performance) still need to be better investigated. Therefore, some research questions emerge from this work such as do operational capabilities have an impact on market performance? Does absorptive capacity indirectly improve market performance (mediation effect through management control)? Does management control improve market performance?

In the operations as well as in management accounting literature, there are still open issues regarding the variability of performance. That is, which dimensions have the greatest impact on this construct? So that, in this research is expected to contribute to four important aspects to this literature. First, to identify which operational capabilities best explain the variability of the market performance. Second, to identify the competencies of AC that best account for the variability of market performance. In this case, we analyze the indirect effects through management control (mediation effect) on market performance. Third, to evaluate if the managerial control has a positive influence on market performance. Fourth, the theoretical contribution is to deepen the analysis of the relationship between those constructs and in sectors that have fierce competition and in the face of an adverse scenario.

Next, this work is structured in the following way: in part two we present a literature review on capabilities, absorptive capacity, management control, and performance. In part three, we described the research methodology. In part four, we present and discuss the results. And in part five, we conclude the paper.

## **2. THE CONSTRUCT AND DIMENSIONS**

The discussion in operations management of which factors affect operational performance is still an open issue in this literature. For some scholars, operational performance is due to the implementation of good operational practices (Flynn, et al., 1995; Ketokivi & Schroeder, 2004; Lillrank, 1995; Voss, 1995). For others, it is the operational capabilities that have a marginal impact on performance (Flynn et al., 2010; Henri, 2006; Schroeder et al., 2002; Swink et al., 2005; Wu et al., 2010; Yang, 2013). Other scholars point out that the absorptive capacity of the company to acquire new knowledge and to apply it in its internal processes is that it affects the performance (Brown, 1997; Cohen & Levinthal, 1990; Fosfuri & Tribo, 2008; Jansen et al., 2005; Zahra & George, 2002).

Additionally, Ittner and Larcker (2001) argue that research involving management accounting and operations management still presents little literature. Therefore, the present work aims to analyze the relationship between capabilities, absorptive capacity, management control, and performance.

Additionally, we investigate whether the operational capabilities affect market performance, as well as whether the absorptive capacity and management control enhance this relationship.

## **2.1 Capabilities**

The study of the company's capabilities has been a recurrent theme in the operations literature, as well as in strategy. The definition of the construct is still a subject of study in the literature due to the profusion of meanings related to the theme, generating a lack of consensus regarding its definition (Dosi, Nelson, & Winter, 2000; Pandža et al., 2003). However, Wu, Melnyk, and Flynn (2010) point out that there is consensus on the construct to provide the company with the ability to reorganize resources for specific purposes.

The literature focuses the most recurring conceptualization of capabilities on resources, routines, and skills (Coates & McDermott, 2002; Felin & Foss, 2005; Hayes & Pisano, 1994; Peng, Schroeder, & Shah, 2008; Pisano, 1994; Swink, 2000). Pandža et al. (2003) define the construct as unique and idiosyncratic processes arising from the interaction in the company throughout its history. On the other hand, Dosi, Nelson, and Winter (2000) understand capabilities on the organizational consciousness context, which contributes to its development and implementation. These authors also recognize the distinction between the construct and organizational routines, however, they point out that certain routines can be understood as capabilities. For Amit and Schoemaker (1993), they represent the idiosyncratic processes arising from tangible or intangible knowledge developed through the interrelationship of company resources. Already, Wu, Melnyk, and Flynn (2010) propose to characterize the construct as a set of competencies (skills, processes, and routines) aiming at the alignment of resources in response to specific problems. More broadly, they represent the strength or proficiency of a set of skills and/or competencies to manage resources for task execution.

This definition is in line with Teece, Pisano, and Shuen (1997) when they refer to the way of carrying out the activities. On the other hand, Ray, Barney, and Muhanna (2004) emphasize that resources and capabilities are used interchangeably, referring to the tangible and intangible assets that enable the development and implementation of strategies by the company.

Pandža et al. (2003) and Wu, Melnyk, and Flynn (2010) argue that capabilities are competencies difficult to transfer, but this is not the case with resources. For Amit and Schoemaker (1993) the resources correspond to a set of factors controlled and managed by the company.

In the organizational context, some researchers understand capabilities as a set of organizational routines (Peng et al., 2008; Winter, 2003). For Teece and Pisano (1994) and Teece et al. (1997), the construct represents the organizational or management processes around which the company does things or a pattern of how the business performs its activities to achieve its

goals (Ray et al., 2004). Dosi, Nelson, and Winter (2000) recognize the qualification of "do things" is very vague and they prefer to define routines as an organized activity of a repetitive procedure. These definitions of routines are closely related to the managerial or organizational processes of conducting the business. Teece et al. (1997) also point out that these processes have three primary functions such as coordination/integration of the company's internal activities, learning related to the process of repetition and experimentation aiming to the execution of the better and faster tasks, and reconfiguration/transformation of the asset structure. These definitions of a company's routines can be seen as a recurring or repetitive process. Consistent with this argument, Becker (2001) also understands that without the perspective of repetition the definition of routines is unacceptable.

The literature deals with the measurement of capabilities under the context of multidimensional measures of operational performance, which include cost, quality, flexibility, and deliveries (Ferdows & De Meyer, 1990; Flynn & Flynn, 2004; Rosenzweig & Roth, 2004; Schroeder et al., 2011; Skinner, 1969). Avella and Vázquez-Bustelo (2010) still add "environmental protection" as relevant competence. Peng et al. (2008) suggest measuring the capabilities as a second order factor whose routines are the centered of definition. By contrast, Wu, Melnyk, and Flynn (2010) understand the construct should be evaluated under the scope of commonalities and some reflective indicators of the company.

For RBV, capabilities correspond to specific intangible assets, which were developed internally by the company and its competitor cannot purchase them (Hayes & Pisano, 1994, 1996; Swink, 2000). Its operationalization takes place through different perspectives, which must be cultivated in order to respond to the market (Hayes & Pisano, 1994). These authors suggest some capabilities, for example, production, logistics, R & D, continuous improvement, innovation, project management, among others.

According to Coates and McDermott (2002), when a company emphasizes its competencies, this occurs due to it aims to difficult the equalization of those competencies by the main competitors, which would provide gaining or maintaining an advantage in the target segment. For Pisano (1994), when the organizational routines incorporate the learning and organizational knowledge, they improve the company's skills and competencies.

From the strategic perspective, the competitive priorities comprise some basic capabilities operationalized by cost, quality, speed, and flexibility (Hayes & Wheelwright, 1984; Wheelwright, 1984; Wheelwright & Hayes, 1985). These studies focus on best practices and operational methods.

### **2.1.1 Cost Efficiency and Flexibility**

In operations, the competitive priorities comprise a set of dimensions such as cost and flexibility (Chen, Dultra-de-Lima, Csillag, & Oyadomari, 2015; Fleury & Fleury, 2004; Hayes & Wheelwright, 1984; Wheelwright, 1984), in which

companies focus on achieving a competitive advantage. Additionally, they are also objective measures of operational performance (Flynn et al., 2010; Ketokivi & Schroeder, 2004a; McKone, Schroeder, & Cua, 1999). Therefore, under the operational context, they are relevant competitive criteria.

From the capabilities perspective, Swink et al. (2005) admit that cost efficiency and flexibility are dimensions that influence market performance through a greater integration of operational processes. They call it strategic integration; Others, Although operations literature treats these dimensions as capabilities or operational practices, there is a consensus that these measurements are responsible for a marginal increase in performance (Ketokivi & Schroeder, 2004a; Laugen, Acur, Boer, & Frick, 2005). This is also ratified by other researchers on the subject (Flynn & Flynn, 2004; Rosenzweig & Roth, 2004; Wu et al., 2010). However, there are some dimensions whose relationship is not positive. For example, Rosenzweig, Roth, and Dean (2003) have argued that process flexibility has a positive influence on customer satisfaction, but did not confirm the same impact on sales. As for the leadership in cost, they observed a positive relationship in sales, but did not ratify the same direction in customer satisfaction.

By turning the attention to cost efficiency, from the capability perspective, it is almost straightforward to infer that capability is positively related to the organizational performance (Peteraf & Barney, 2003). Thus, while observing the role of cost efficiency in the supply chain, we can infer that cost efficiency creates values. However, according to (Brandenburger & Stuart, 1996), the value created can be appropriated either by the supplier or by the customer depending on the power of these agents in the chain.

Thus, in a business scenario where supplier and customer have the power to appropriate the value, which is the case of the auto parts industries, we expect that the value created by cost efficiency of the focal firm is all appropriated by the carmaker (customer). Therefore, based on the rationales above, we declare the following hypotheses:

H1: Operational capabilities have a positive relationship with market performance.

H1a: Cost efficiency does not have a positive relationship with business performance.

H1b: Cost efficiency has a positive relationship with customer satisfaction.

H1c: Process flexibility has a positive relationship with business performance.

H1d: Process flexibility has a positive relationship with customer satisfaction.

## **2.2 Absorptive Capacity**

The seminal articles by Cohen and Levinthal (1989, 1990, 1994) propose a new theory based on how firms capture external knowledge and use it for organizational purposes (Lane & Lubatkin, 1998). The authors suggest that the

prior knowledge and relevant skills of a company are those that enable the assimilation of new knowledge and, in a way, do things in other configurations (Cohen & Levinthal, 1989).

In order to express this ability, Cohen and Levinthal (1989, 1990, 1994) proposed the term absorptive capacity (AC), which represents the ability of a company to recognize the value of new information, then to assimilate it and apply it for Business purposes. However, there is no consensus among scholars on this definition. For example, Zahra and George (2002) propose a redefinition of the construct because they consider that this meaning is quite broad and incomplete. They prefer to look at AC from the perspective of dynamic capabilities. For them, the construct corresponds to the set of routines and processes of the company, which allows the acquisition, assimilation, transformation, and exploitation of external knowledge aiming to the generation of a dynamic organizational competence. Narasimhan, Rajiv, and Dutta (2006) also corroborate this view of dynamic skills for the definition of AC. These authors suggest that the process of absorption of know-how is essentially one of the most valued and uses a series of knowledge assets, which are sometimes not structured.

Later, Todorova and Durisin (2007) complemented the model proposed by Zahra and George (2002) because they observe some irregularities. However, they recognize that there is a relation with the original model of Cohen and Levinthal (1990).

Lane and Lubatkin (1998) also suggest a redefinition of AC proposed by Cohen and Levinthal (1990). They argue to evaluate the AC construct as a learning dyad, which is determined by three characteristics of firms that learn from each other such as knowledge bases, organizational structures and remuneration policies, and dominant logic.

By contrary, Tu et al. (2006) prefer to define the AC construct as a set of organizational mechanisms that enable the identification, communication, and assimilation of relevant external and internal knowledge. They suggest four dimensions of AC such as relevant prior knowledge, communications network, communications climate, and exploration. But Tsai (2013) prefers the definition of AC as arising from the prolonged process of accumulation of investment and knowledge. In this process, investments in R&D are a necessary condition for the generation of AC (Cohen & Levinthal, 1990; Tsai, 2001), as it allows the generation of new information, enabling the company to assimilate and exploit the current information (Cohen & Levinthal, 1989).

Cohen and Levinthal (1994) further point out that AC has a critical characteristic due to its cumulative aspects. In this situation, two relevant components emerge, for example, the previously acquired knowledge impacts on the current learning process, the development of AC is cumulative, and this allows for greater efficiency in its expansion in future periods.

As for the acquisition of AC, this competence can be achieved in several ways. Cohen and Levinthal (1990, 1994) suggest that this is possible by

investing in R & D, through manufacturing involvement, or through learning. However, the company's AC depends on of its collaborators' AC (Cohen & Levinthal, 1990).

### **2.2.1 Potential and Realized Absorptive Capacity**

Zahra and George (2002) suggest seeing AC as dynamic capabilities. They proposed two dimensions of the AC constructs such as potential absorptive capacity (PAC) and realized absorptive capacity (RAC). The first constructs (PAC) comprises acquisition and assimilation. The second constructs (RAC) includes transformation and exploitation. According to them, these resources are complementary.

The literature suggests that the adequate management of the AC dimensions impacts on the performance of the company. Zahra and George (2002) pointed out when a firm pays attention to these constructs; it experiences superior performance. Jansen, Van Den Bosch, and Volberda (2005) also suggest when the company focuses on PAC, it constantly refined the knowledge stock but increases its costs in order to reach a new level of learning. According to Zahra and George (2002), PAC provides the company the flexibility and freedom to adapt quickly to the environment. On the other hand, RAC is the primary source of performance improvements, which means when the company focuses on RAC, it tends to make a profit in the short term; however, it neglects to respond to the environment due to a lack of internal skills (Jansen et al., 2005).

However, Brettel, Greve, and Flatten (2011) prefer to discuss the influence of PAC on performance from internal factors. For them, internal factors such as speed of decision making, internal uncertainties, the tendency of taking risks, and entrepreneurial orientation are responsible for such impact of PAC on performance. On the other hand, Cohen and Levinthal (1990) point out that the relevant component for leveraging AC and influencing performance is the prior knowledge. However, the ability to manage and apply externally acquired new knowledge must be in line with the company's objectives.

According to Leal-Rodríguez et al. (2014), PAC captures the efforts arising from the identification and acquisition of new external knowledge. This construct provides an increase in the company's ability to exploit the relevant external information (Fosfuri & Tribo, 2008). For Massini (2010), the primary goal of the construct is to capture the uncertainty related to the company's ability to explore new external information.

By contrast, RAC understands the new insights and results from the combination of current and newly acquired knowledge in operations (Leal-Rodríguez et al., 2014). In other words, it represents the capacity to leverage acquired knowledge and transform it into innovation results (Fosfuri & Tribo, 2008; Zahra & George, 2002). According to Zahra and George (2002), these two subcategories (PAC and RAC) have complementary roles. Considering the discussion pointed out in the literature, we declare the following hypotheses:

H2: The absorptive capacity has a positive relationship with management control.

H2a: The potential absorptive capacity does not have a positive relationship with cost control.

H2b: The realized absorptive capacity has a positive relationship with cost control.

### **2.3 Management Control**

The literature defines management control as the process in which companies execute it to implement their strategies (Anthony & Govindarajan, 2008, p. 10; Simons, 1991), as well as their process control (Otley, 1994). Other scholars also argue that the management control system (MCS) should be designed to support business strategy (Langfield-Smith, 1997; Simons, 1994). This view is corroborated by Henri (2006) when discussing the alignment of the strategy and the MCS, which emphasizes the importance of this relationship by literature in the area. But Bruggeman, Bartholomeeusen, and Heene (1988) prefer to look at the management control under the motivational context aiming to the attention to organizational objectives. Overall, MCS has a close relationship with performance. On the other hand, Simons (1987) prefers to look at the MCS under the concept of capabilities, in which the routines and procedures correspond to maintain or modify organizational activities. According to this author, MCS comprises a range of processes, including planning, budgeting, cost control, environmental analysis, competitive process analysis, performance evaluation, resource allocation, and incentives. That is, these processes are conceived from the perspectives of routines, which require information to maintain or adjust the organizational activities (Simons, 1987). However, Henri (2006) understands that MCS acts as an antecedent of the organizational capabilities, that is, it represents the mechanism of influence of the company's competencies. In this sense, Henri (2006) analyzes the MCS impact under the context of diagnostic and interactive mechanisms in the generation and maintenance of organizational capabilities.

On the other hand, Merchant and Van der Stede (2012) understand that a proper MCS should be a tool capable of giving managers confidence that undesirable factors will not occur. In the occurrence of any adverse event, it prejudices the performance of the company.

Following this line of reasoning, it is observed that the literature presents evidence of the positive influence of the management control tools on performance (Chenhall, 2003; Govindarajan & Gupta, 1985; Marginson, 2002; Nisiyama et al., 2016). In operations, some scholars address the importance of management controls as performance monitoring and correction mechanisms (Bruggeman et al., 1988; Wheelwright & Hayes, 1985). Therefore, MCS becomes critical to maintaining focus on organizational goals.

### **2.3.1 Cost Control**

Malmi and Brown (2008) when analyzing MCS as a package of managerial artifacts argue that this model can contribute to the understanding of how the definition of control systems can support organizational activities. Chenhall (2003) points out that the control systems are more related to the set of activities inherent to the processes, for example, statistical quality control, just-in-time system, among others. Consistent with this view, Van Veen-Dirks (2005) argues that management accounting and the control system support managerial behavior to meet the production strategy.

On the other hand, Merchant and Otley (2007) prefer to look at the control systems as a broad process that comprises the strategic development, strategic controls, and learning processes. These controls are part of a set of controls that make up the MCS and contribute to achieving organizational goals. Therefore, it has to do with performance.

Based on the discussion above, the cost control is a process that is part of the MCS (Langfield-Smith, 1997). It is also possible to highlight that this managerial tool has a positive influence on market performance measures captured by ROI, ROA, market share, among others (Ketokivi & Schroeder, 2004a). Given this, it is possible to infer in a positive relationship with performance. However, by observing the supply chain, the bargaining power of the customer and supplier can impact seriously on the business performance of focal firm (Porter, 1992). Therefore, even having a great cost control process in the organization, it should not have a great impact on the performance. In other words, the cost control, sine qua non condition for the focal firm to compete. Consequently, in an industry where upper/lower stream of the supply chain has great bargain power on the focal firm, the more the presence of cost control won't be positively related to the business performance. Thus, we declare the following hypotheses:

H3: The management control has a positive relationship with market performance.

H3a: The cost control does not impact directly on the business performance.

H3b: The cost control has a positive relationship with customer satisfaction.

### **2.4 Performance**

The literature characterizes the performance construct in both operations and managerial accounting as multidimensional (Kafetzopoulos & Gotzamani, 2014). For Ketokivi and Schroeder (2004a), if the research ignores the multidimensionality of the construct, its assessment will be incomplete. Therefore, it requires analyzing performance from different perspectives.

On the other hand, more contemporary approaches analyze performance from the standpoint of financial and non-financial measures (Kaplan & Norton, 1992, 2001, 2007; van Veen-Dirks, 2010; Van Veen-Dirks, 2005). Regarding these perspectives, we assess the market performance construct based on two dimensions such as customer satisfaction and business performance.

#### **2.4.1 Market Performance**

The literature defines market performance construct considering the commercial dimensions (Thieme et al., 2003). For example, for these authors, a set of dimensions to measure the construct can compose the proxies such as return on investment (ROI), profitability, sales, market share, contribution to technological leadership, contribution to the retention of employees, and the degree of customer satisfaction. Consistent with this view, Tatikonda and Montoya-Weiss (2001) argues that the dimensions that capture the market outcome can measure market performance. They suggest four measures such as sales, customer satisfaction, profitability, and market share. For Baccarini (1999), market performance can be measured through product success, which means hitting the commercial dimensions.

On the other hand, in operations, (Ketokivi & Schroeder, 2004a) also highlight market measures to evaluate performance. This view is also corroborated by Swink et al. (2005), in which they also consider some indicators of market performance such as market share, the growth of market share, measures of profitability, and sales. These usually are the primary measures to evaluate the performance of the business.

### **3. CONSIDERATIONS ON THE RESEARCH TECHNIQUE**

We planned quantitative research based on the survey questionnaire, which focus on capabilities. We used multi-item measurement scales using a seven points Likert scale. In appendix of the paper we provide the measurement scales. We adapted a survey instrument from the literature for collecting the data. Even though the survey questionnaire is in English, it was applied in Portuguese. The survey questionnaire was translated into Portuguese and the translation was assessed by a specialist in the survey. The questionnaire has four main blocks to assess the constructs. The first block aims to assess the operational capabilities through the dimensions such as cost efficiency and process flexibility. The second block aims to assess the management control through the dimension cost control. The third block aims to assess the absorptive capacity through the dimensions such as potential absorptive capacity and realized absorptive capacity. And finally, the fourth block aims to assess the market performance through the dimensions such as business performance and customer satisfaction.

The questionnaire was validated through pre-test qualitative interviews with three academic professor experts in the survey and with five master degree students. The interviews were done personally. They noted that the scales do not have major problems in terms of distortions (problems with assertive, lack of objectivity, among others). They suggested small corrections that were done for the final questionnaire. After that, we collected data from a small sample, where fifteen respondents assessed the questionnaire in the focus sector, and we conclude that the questionnaire was done for collecting data. The aim of this phase is to capture and solve possible problems that the respondent would have in the data collection process. According to Hair Jr. et al. (2009, p. 560), the pre-test is important when scales are applied in a specific context.

We developed this research into the auto parts and food sector in São Paulo State, in Brazil. We selected the samples from the National Association of Auto Parts Manufacturers (ANFAPE) and from the Brazilian Association of Food Industries (ABIA). In ANFAPE master list we selected 449 companies, and contacted 179 of them. In ABIA master list we selected 924 companies, and contacted 189 of them.

The data collecting was done in the period from April 13 to June 09, 2017. In this period, we tried to contact all the companies in our database by phone. However, many problems occurred, for example, the phone of the company did not exist anymore, the company refuses to answer the research, and among other problems. From these contacts, 155 potential respondents accessed the questionnaire, and we obtained 88 complete response; however, some responses outside the research profile and; therefore, were eliminated from the base. The final total of valid responses was 63. In the food sector we received 19 valid responses, in the auto parts sector we received 29 valid responses, and respondents who did not place the sector were 15 valid responses. From the total 368 companies contacted in two sectors, we obtained 63 valid responses corresponding to 17.12% response rate. In our quantitative analysis, we maintained the confidentiality of the respondent and company names.

For assessing the data, we use a combination of statistical procedures, which provides both testability and context and increases the robustness of the results (Kaplan & Duchon, 1988), and a synergistic process (Eisenhardt, 1989). For instance, we use ANOVA test for analyzing the possibility of using two samples collected from the two sites such as ANFAPE and ABIA. The test was necessary due to having received few answers in the food sector, and in some cases, the respondents did not place the sector. Our results indicate that the two samples come from the same population and there is no major problem working with them.

We used the Harman's single factor for testing the common method variance (CMV) (Bagozzi, Yi, & Phillips, 1991; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Podsakoff, MacKenzie, & Podsakoff, 2012). The problem with the CMV occurs when we measure the dependent and independent variables with the same instrument. Therefore, it is possible to find an artificial relation

between them. This only exists because the two variables were collected with the same instrument, which is a threat to the validity of the study. The literature calls this problem as a threat the common method variance.

Then, we used the confirmatory factor analysis (CFA) through Smart-PLS (Ringle, Wende, & Becker, 2015) for validating the measurement model. And finally, for assessing the indirect effect (mediation effect) of the absorptive capacity and the direct effects of the operational capabilities and management control on performance, we used structural equation modeling (SEM) also through Smart-PLS.

### 3.1 TESTED CONCEPTUAL MODEL

The theoretical model (Figure 1) was developed based on a review of the literature on operational capabilities, absorptive capacity, and market performance. According to this literature, the operational capabilities influence on performance (Flynn et al., 2010; Henri, 2006; Schroeder et al., 2002; Swink et al., 2005; Wu et al., 2010; Yang, 2013). By contrast, other scholars argue that the absorptive capacity is the dimension that influences on performance (Brown, 1997; Cohen & Levinthal, 1990; Fosfuri & Tribo, 2008; Jansen et al., 2005; Zahra & George, 2002). Given this, there is no consensus on the issue. Therefore, this work intends to analyze the direct influence of operational capabilities and management control on market performance. And the indirect influence of absorptive capacity on market performance through management control (mediation effect).

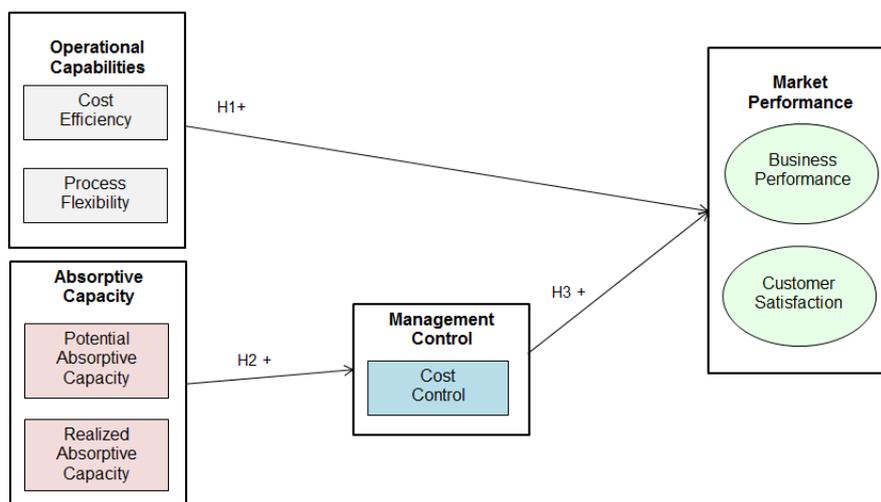


Figure 1 – Conceptual model

H1: Operational capabilities have a positive relationship with market performance.

H1a: Cost efficiency does not have a positive relationship with business performance.

H1b: Cost efficiency has a positive relationship with customer satisfaction.

H1c: Process flexibility has a positive relationship with business performance.

H1d: Process flexibility has a positive relationship with customer satisfaction.

H2: The absorptive capacity has a positive relationship with management control.

H2a: The potential absorptive capacity does not have a positive relationship with cost control.

H2b: The realized absorptive capacity has a positive relationship with cost control.

H3: The management control has a positive relationship with market performance.

H3a: The cost control does not impact directly on the business performance.

H3b: The cost control has a positive relationship with customer satisfaction.

## **4. PRESENTATION AND DISCUSSION OF RESULTS**

### **3.1. Demographic Profile of the Sample**

We started with the respondent profile. We observed that the most of the respondents work for middle size companies. For example, 22.2% of them work for the small companies, and the most of them (77.8%) work for middle and large size companies. Regarding their maturity, approximately 84.1% of our respondents have more than 30 years old, and 30.2% have more than 40 years old. Thus, the profile of the respondents is adequate for the purpose of our research.

We also noticed that our sample is essentially male. The work environment is dominated by male (76.2%), and only 23.8% are female.

Regarding their professional position, the most of them (approximately 82.5%) are working as managers or director positions. Regarding experience in the area, 84.1% of them have more than three years of experience. This was the minimum required from the respondent. Thereby, our sample is adequate for the purpose of our research.

### **3.2. Data Analysis**

In this section, we address the discussion of the data analysis.

The missing values are not major problems in our data collection. We had only two missing values in the key variables and distributed randomly. Given that, we replace them by the average of their original variables (Corrar, Paulo, & Dias Filho, 2009, p. 38; Hair Jr. et al., 2009, p. 65) through SPSS.

As for outliers, we had twelve cases, and we assessed them through univariate detection, following the suggestion of Clark-Carter (2004) and Kline (2011, p. 54). As we had few responses, we decided to maintain them in the sample.

The next analysis was the normality of our data. For assessing the data, Kline (2011) suggests to work with the cutoff value of 3.0 for absolute skewness and 10.0 for absolute kurtosis. In our data, all values are below these cutoff points. The absolute value of skewness and kurtosis are 2.154 and 5.438, respectively. As a result, there is evidence that our data are approximately normally distributed.

And finally, before proceed to the analysis of the measurement model by the CFA through Smart-PLS, we examined the common method variance (CMV) (Bagozzi et al., 1991; Podsakoff et al., 2003). The result showed the only single factor extracted was responsible for 32.65% of the total variance; therefore, CMV is not a problem because the variance extracted is below 50% and no correction is needed in our model.

### **3.3. Research results and discussion**

In this section, we discuss in detail the results of quantitative research.

#### **3.3.1. Measurement Model Analysis**

For assessing relationships between the constructs such as cost efficiency (EFIC), process flexibility (FLEXI), cost control (COST), potential absorptive capacity (PAC), realized absorptive capacity (RAC), business performance (BUSI), customer satisfaction (SATI) of the structural model (Figure 1), we used the confirmatory factor analysis (CFA) and structural equation modeling (SEM) techniques through the Smart-PLS (Ringle et al., 2015).

The use of this software has some advantages, for instance, is suitable for smaller sample (Smith & Langfield-Smith, 2004) and with few indicators to measure (Chin & Newsted, 1999, p. 313). By contrast, the PLS path modeling (PLS-PM) technique does not have adequate indicators capable for assessing the model fit (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005), an example of LISREL and AMOS. However, it is appropriate to maximize the explained variance of the dependent variables (Chin & Newsted, 1999, p. 312; Hair, Ringle, & Sarstedt, 2011; Oyadomari et al., 2014). Hair et al. (2011) also states that the PLS-SEM is suitable when one wants to contribute to the development of the theory.

The conceptual models above (Figure 1) and their relationships between the latent variables were evaluated based on the suggestions of Fornell and Larcker (1981), Tenenhaus et al. (2005), Wetzels, Odekerken-Schröder, and van Oppen (2009), and Hair et al. (2011).

We assessed the measurement and structural model based on the indicators of CFA (Miller, Rainer Jr., & Harper, 1997). The measurement of convergent validity through factor loadings. Initially, the factor loadings that exhibited very low loading for some indicators (below 0.50) were removed from the measurement model. For instance, the indicators of PAC (PAC1, PAC2, PAC2, PAC4R, and PAC6) and RAC (RAC4R, RAC5R, RAC8R, and RAC11R). Additionally, we have removed some business performance indicators such as BUPE 2, BUPE 4 and BUPE5, leaving only the construct with financial measures. Therefore, the factor loadings show convergence to a common point (Hair et al., 2009). Figure 2 shows indicators that present the convergent validity of the measurement model. All of them present the significance of factors by the t-test above 1.96 through the p-value <0.05, regarding the confidence level at 95%.

Another way to assess the construct validity and reliability is through variance extracted (AVE). All the constructs exhibit adequate convergence, and their coefficients are above of 0.50 (Fornell & Larcker, 1981; Hair Jr. et al., 2009).

Regarding the discriminant validity, Table 2 reports the square root of AVE on the diagonal matrix. As these values are above the intercorrelations of the constructs, it can be stated there is discriminant validity (Fornell & Larcker, 1981). It means that even though the constructs are correlated, they are distinct from them. Another way to examine the discriminant validity, also suggested by Fornell and Larcker (1981), is through factor loadings.

	AVE	Composite Reliability	R Square	Cronbachs Alpha	Communality	Redundancy
Business Performance	0.8329	0.9373	0.2813	0.8999	0.8329	0.0744
Cost Control	0.7705	0.9302	0.3605	0.8978	0.7705	0.1303
Cost Efficiency	0.5185	0.8428	0.0000	0.7664	0.5185	0.0000
Customer Satisfaction	0.6401	0.8981	0.4008	0.8574	0.6401	0.2078
PAC	0.5772	0.8435	0.0000	0.7550	0.5772	0.0000
Process Flexibility	0.6059	0.8843	0.0000	0.8373	0.6059	0.0000
RAC	0.5350	0.9013	0.0000	0.8741	0.5350	0.0000
<b>Average</b>	<b>0.6400</b>	<b>0.8911</b>	<b>0.1489</b>	<b>0.8411</b>	<b>0.6400</b>	<b>0.0589</b>

Table 1 – Overview

	Business Performance	Cost Control	Cost Efficiency	Customer Satisfaction	PAC	Process Flexibility	RAC
Business Performance	<b>0.9126</b>						
Cost Control	0.3925	<b>0.8778</b>					
Cost Efficiency	0.4401	0.5307	<b>0.7201</b>				
Customer Satisfaction	0.3679	0.5944	0.4889	<b>0.8001</b>			
PAC	0.4953	0.5415	0.5536	0.5695	<b>0.7597</b>		
Process Flexibility	0.4953	0.5337	0.6568	0.4611	0.6446	<b>0.7784</b>	
RAC	0.3977	0.5894	0.6467	0.5448	0.8030	0.5525	<b>0.7314</b>

Table 2 – Latent Variable Correlation (Square root of the AVE on the diagonal)

The reliability of the model was evaluated based on Cronbach's Alpha and composite reliability (Table 1) (Hair et al., 2011; Henseler, Ringle, & Sinkovics, 2009; Popadiuk, 2012). The coefficient of composite reliability, which evaluates the convergence or internal consistency of the constructs are adequate and above of 0.70 (Hair et al., 2011; Hair Jr. et al., 2009; Henseler et al., 2009). Regarding the Cronbach's Alpha, the constructs present unidimensionality if the coefficients are above 0.70 (Tenenhaus et al., 2005).

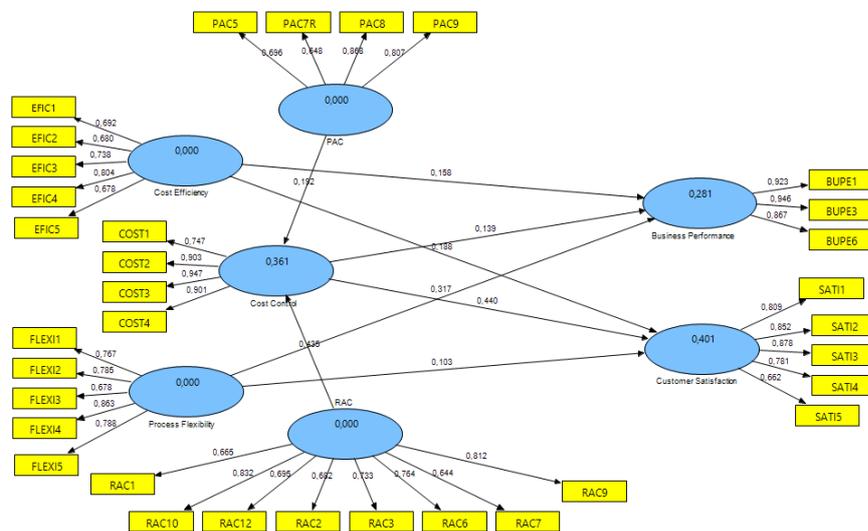


Figure 2 – Structural model – Factor Loadings

We also assess the adequacy of fit model following the suggestion of Tenenhaus et al. (2005, p. 173) and Wetzels et al. (2009, p. 187) who propose the goodness-of-fit test (GoF). The test is calculated based on the geometric mean of the average AVE and average  $R^2$ . The coefficient calculated was 0.3087 above the cutoff value of 0.25 for medium effects. Therefore, the structural measurement model is adequate.

To assess the coefficients stability, we run the bootstrapping (Chin & Newsted, 1999, p. 328). The estimates of model are significant considering the t-test at 5% level, which are greater than 1.96.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Cost Control -> Business Performance	0.1394	0.1537	0.0962	0.0962	1.4502
Cost Control -> Customer Satisfaction	0.4398	0.4326	0.1282	0.1282	<b>3.4293</b>
Cost Efficiency -> Business Performance	0.1577	0.1915	0.1326	0.1326	1.1894
Cost Efficiency -> Customer Satisfaction	0.1879	0.2069	0.1171	0.1171	<b>1.6048</b>
PAC -> Cost Control	0.1920	0.2042	0.1357	0.1357	1.4150
Process Flexibility -> Business Performance	0.3173	0.3363	0.1669	0.1669	<b>1.9016</b>
Process Flexibility -> Customer Satisfaction	0.1030	0.1422	0.1034	0.1034	0.9958
RAC -> Cost Control	0.4352	0.4795	0.1538	0.1538	<b>2.8294</b>

Table 3 – Path Coeficients (Mean, STDEV, T-Values)

### 3.3.2. Result Analysis

From the measurement model, we assessed our hypotheses. Based on Figure 2, the path coefficients have the same function as the standardized beta in regression analysis and their significance are assessed through bootstrapping method (Hair et al., 2011, p. 147). The results show a positive and significant relationship between cost control and customer satisfaction in 0.4398 (t-test = 3.4293), between process flexibility and business performance in 0.3173 (t-test = 1.9016), between process flexibility and customer satisfaction in 0.1879 (t-test = 1.6048), and between RAC and cost control in 0.4352 (t-test = 2.8294). The other path coefficients show no significant.

These results supported our hypothesis H1a, H1b (supported partially), H1c, H2b, H3a, and H3b. By supporting the hypothesis H1a and H1b, we observed that by increasing the cost efficiency, companies tend to maintain a tighter cost control of their operations. The gains from increased productivity as well as process management, which focus on reducing costs through eliminating waste. However, the value created through this action was majorly appropriated by a powerful customer, thus, benefiting their customers. This finding is in line with the literature on competitive strategy and values appropriate (Brandenburger & Stuart, 1996; Porter, 1992). The existing literature suggests that companies that seek to defend their position through a cost-based strategy are more concerned

with offering products at the lowest possible price. It occurs in the Brazilian auto parts industries that are strongly influenced by an extremely aggressive automakers' cost reduction policies. The food industry also suffers from fierce competition in this market. The industry is heavily sprayed, and there is strong pressure to reduce costs.

In the same rational, we also supported our hypothesis H3a where cost control does not have an impact on financial performance. It indicates that the sectors under analysis do not retain the benefit of cost reduction, which would justify poor financial performance as they work with narrow margins. In other words, marginal cost reductions are to some extent appropriated by customers.

When analyzing capabilities from the perspective of cost efficiency, we observed that cost efficiency capacity is directly associated with customer satisfaction (H1a), which means this capacity is appreciated by the customer, despite he does not create value to the organization. On the other hand, the process flexibility does not impact on customer satisfaction, but its influence on the business financial performance (H1c). By combining these two results, we could understand that organizational performance of a company is impacted by the complementary of different capabilities (Dierickx & Cool, 1989). In addition, the non-confirmation of our hypothesis H1c could be associated to an eventual lack of efficiency from the production perspective.

We analyze the hypothesis H2a that was also supported by the results and is also in line with the literature. For a company applies the relevant knowledge captured from the outside aiming to modify processes and routines, firstly, it needs to recognize the value of a new information and then acquire it and assimilate it. The acquisition and assimilation correspond the two basic dimensions of PAC. However, the application of knowledge occurs only through the RAC and not by the PAC (Jansen et al., 2005; Todorova & Durisin, 2007; Zahra & George, 2002). Additionally, Cohen & Levinthal (1994) point out that the knowledge acquired previously impacts on the current learning process, which will be used in the future. It means the knowledge is stock constantly refined when the company focuses on PAC (Jansen et al., 2005).

The applied knowledge aiming to improve the processes, for instance, the cost control, tends positively influence on performance (H2b). This is in line with the literature which points out that RAC is the primary source of performance improvements (Jansen et al., 2005). It means when the company focuses on RAC, it tends to make a profit. Even though the literature points out that the profit earned occurs on the short-term, the discussion here is not the temporal, but regarding the influence of the construct.

In the last three years, the Brazilian economy has suffered a political and economic crisis, which has affected its market, mainly of durable goods (vehicles). And this may also be an explanation because cost control tends to be a priority in an adverse scenario like this. As a result, the information provided by the cost system becomes fundamental to decision-making, notably in sectors of fierce competition. Summary of results:

Code	Hypotheses	Status
H1a	Cost efficiency does not have a positive relationship with business performance.	Supported
H1b	Cost efficiency has a positive relationship with customer satisfaction.	Supported partially
H1c	Process flexibility has a positive relationship with business performance.	Supported
H1d	Process flexibility has a positive relationship with customer satisfaction.	Not supported
H2a	The potential absorptive capacity does not have a positive relationship with cost control.	Supported
H2b	The realized absorptive capacity has a positive relationship with cost control.	Supported
H3a	The cost control does not impact directly on the business performance.	Supported
H3b	The cost control has a positive relationship with customer satisfaction.	Supported

Table 4 – Summary of results

## 5. FINAL CONSIDERATIONS

This article aimed to evaluate what dimensions of operational capabilities, absorptive capacity, and management control (mediation and direct effect) have a relevant impact on market performance. This important due to the study of variability on performance continue an open issue in the operations as well as in management accounting literature. Additionally, there is a lack of consensus of what is the main dimension that explains performance. Some scholars point out that operational capabilities impact on performance (Ketokivi & Schroeder, 2004a; Laugen et al., 2005). For others, is the absorptive capacity when capturing the relevant knowledge from the marketplace and applying it internally to improve processes and routines is what impact on performance (Cohen & Levinthal, 1990; Jansen et al., 2005; Zahra & George, 2002). However, the literature is still incipient in exploring a construct as mediator effect between absorptive capacity and performance. In this sense, the assessment of the impact on performance occurs indirectly. In addition, the relationship between absorptive capacity and management control is also incipient in the literature and deserves more studies by the scholars.

Given that, the result showed that when the company focuses on cost efficiency, it seeks to tighten the control of processes. The gains arising from this management control tend to be appropriated by the customers, which impact positively on their satisfaction but generates poor operational performance (Brandenburger & Stuart, 1996; Porter, 1992). Therefore, H1a was not supported, but H1b was supported partially.

The same analysis can be extrapolated to the cost control construct (H3a and H3b were supported). Since these industries work with tight margins, they tend to have poor operating performance. Two factors may explain these results. First, the high competition faced by these sectors in the Brazilian market

that influences on business relationships. Second, the bargaining power of both buyers and suppliers. As a result, cost control has no impact on financial performance, but affects the customer satisfaction by appropriating of operating gains.

By contrast, the hypotheses of process flexibility were supported partially. It means that the industries under analysis still suffer from efficiency in adjusting quickly their operation (product mix, volumes, capacity, among others). The result showed influence on the business financial performance (H1c), but no influence on customer satisfaction (H1d). These results could be explained by the complementarity of different capabilities (Dierickx & Cool, 1989), under which impact on organizational performance.

Regarding the hypotheses H2a and H2b both supported, it noted that the knowledge acquired and assimilated (dimensions of PAC) does not impact on performance directly, but through the RAC (the dimensions are transformation and exploitation). The application knowledge tends to improve the cost control in these sectors. For instance, the companies quickly recognize the usefulness of new external expertise in the current activities. The results are consonant with the literature.

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