Dynamic Capabilities Mediated by Absorptive Capacity and its Result in Operational Performance: A Study in Fuel Distributors of Industrial Port Complex of Suape/PE

ABSTRACT

The main objective of this research was to analyze the influence of dynamic capabilities, mediated by absorptive capacity, on the operational performance of fuel distribution bases in the Suape / PE Port Industrial Complex. The method is quantitative, the research is exploratory and descriptive and the sample included 70 respondents. It was used the technique of confirmatory factor analysis together with the modeling of structural equations in order to test the formulated hypotheses. the mediation relationship involving the absorptive capacity was not sustained because the stages of acquisition, assimilation and transformation were not so well developed by the distributors. Thus, the only dimension that proved to be relevant was exploitation. For this reason, when an alternative model was proposed to test the incidence of only this stage, it was found that the mediation relationship was evidenced.

Keywords: Dynamic capabilities, organizational routines, absorptive capacity, operational performance.

1. INTRODUCTION

Among fuel suppliers, several distributors set up specific structures, which they call the base of operations that are allocated in large terminals. The activities aimed at distributors are exclusively: i) sales of fuels - ethanol, gasoline, diesel and others; ii) issuing invoices; iii) checking the capacity and condition of the vehicles; iv) guidance to contracted customers (flagged with the distributor's brand); v) planning of delivery routes. To understand a little more about the dynamics of this sector, considering the reality of fuel distributors and terminals in the Suape Port Industrial Complex, PE, this research uses the dynamic capabilities approach that encompasses a research aspect within the strategy universe which contributes to understanding how companies manage the issues of organizational changes, innovations and, above all, obtaining competitive advantages.

However, the phenomenon of dynamic capabilities in organizations still needs more precise clarifications about their fundamentals. In this research, organizational routines are considered as the basis for supporting dynamic capabilities. Organizational routines are building blocks of capabilities, as they allow companies to acquire stability in their operations, their standards and adaptation to the competitive environment (Nelson & Winter, 1982; Teece, Pisano, & Shuen, 1997; Eisenhardt & Martin, 2000).

Absorptive capacity is related to skills relevant to acquisition, assimilation, transformation and exploitation (Popadiuk, 2007, 2012) of external knowledge in order to adapt and maintain business in rapidly changing environments (Zahra & George, 2002). According to Zahra and George (2002), these four capacities are interrelated and inserted in the larger construct, called absorptive capacity, and its purpose is to provide a dynamic capabilities that induces the organization to create, incorporate and use the appropriate knowledge to develop other capacities in the company and generate superior performance.

The performance construct can be discussed under three dimensions. The first consists of the theoretical dimension, to which the organization's performance concept is at the center of strategy theory, given that different perspectives on strategy studies have implications for performance. The second dimension is the managerial one, which measures the performance improvement of organizations. The third dimension, the focus of this proposal, is empirical (operational). It is based on operational performance that a large part of strategy research evaluates this type of construct (Venkatraman & Ramanujam, 1986).

Therefore, this research has as its general objective: to analyze the influence of dynamic capabilities, mediated by the knowledge absorptive capacity, in the result of the operational

performance of the fuel bases in the Suape/PE port industrial complex. In order to answer the general objective, the following specific objectives were formulated: i) to evaluate the characteristics of predominant dynamic capabilities in the routines selected for the study; ii) evaluate the characteristics of the absorptive capacity associated with the routines selected for study; iii) assess which operational performance indicators are used to assess routines.

2. THEORETICAL FRAMEWORK: CONCEPTUAL MODEL AND FORMULATION OF RESEARCH HYPOTHESES

2.1 Articulation between dynamic capabilities and operational performance

The conceptual model is based on the approach of dynamic capabilities by Eisenhardt and Martin (2000) and Wang and Ahmed (2007), who understand that dynamic capabilities are routines and processes and are embedded in them. Thus, the organizational routines, delimiting themselves to the type of operational routine (Nelson & Winter, 1982) are considered as units of analysis where the conceptual model was applied empirically. The operational routines evaluated in this research are present in the customer service routine, in the vehicle loading and unloading routine and in the delivery routing routine selected because they are present in the activities and tasks of the distributors related to the current evaluation of the mentioned routines. The fact of evaluating operational routines occurs in relation to the possibility that they may be subject to changes or alterations, given that the main objective of organizations is to look for alternatives to problems that are being experienced. (Nelson & Winter, 1982; Bingham, Eisenhardt, & Furr, 2007).

Eisenhardt and Martin (2000) and Teece (2009) explain that the advantage of organizations can derive from the capabilities that are rooted in the high performance of routines, based on their processes and historical conditions. In line with this, Deffee and Fugate (2010) defend the need to address the capabilities present in operations with the view of dynamic capabilities.

For the organization to obtain a superior operational performance in relation to its competitors, it is necessary to develop and improve the capacity to provide products or services that generate greater economic value for its customers (Lawson, Cousins, Handfield, & Petersen, 2009). The economic value created by the company consists of the difference between the benefit perceived by customers and the economic cost generated by it. Thus, a company creates a relatively greater economic value than its rivals when it brings benefits perceived by the customer through the differentiation of its products or services, or through low costs (Ferdows, 2006).

Therefore, it is expected that through customer service routines, vehicle loading, and delivery routing, advantages will be provided in measures of distributors' operational performance, including cost reduction, quality improvement, flexibility and delivery time. These dimensions of operational performance are widely used by the specialized literature, especially in the works of González-Benito (2005). Although there are several types of organizational performance, such as financial and marketing, in this research only the performance in its operational aspect is appreciated. Thus, the following hypothesis was formulated in order to understand the distributors' capabilities with regard to the perception of the environment, siezing opportunities and the ability to manage threats and adaptations: **H1: Dynamic Capabilities has a positive impact on operational performance.**

2.2 Articulation between dynamic capabilities and absorptive capacity

Zahra and George (2002) reconceptualize the absorptive capacity as a dynamic capabilities belonging to the creation and use of knowledge that improves the organization's ability to obtain a competitive advantage in relation to other companies. The authors point out that dynamic capabilities allow the organization to reconfigure its resource bases and adapt to changing market conditions. Therefore, they define the absorptive capacity as a set of organizational processes and routines by which the organization acquires, assimilates, transforms and explores knowledge to produce a dynamic organizational capacity (Zahra & George, 2002). Absorptive capacity would be a dynamic capabilities that influences the organization's ability to create and deploy the knowledge necessary to create other organizational capabilities (Zahra & George, 2002).

In Todorova and Durisin (2007) the ability to recognize the value of new external knowledge represents an important component of the absorptive capacity, since this valorization is not automatic. The authors reinforce that a model that contemplates the absorptive capacity must capture its respective dynamics through the addition of feedback cycles since the future absorptive capacity is determined by the current absorptive of new knowledge in the organizational routines and processes.

The organization can absorb knowledge from the external environment, but it will only do so if the knowledge repositories and the minds of the individuals that compose it are looking for and are receptive to that knowledge based on what they already know (Roberts, Galluch, Dinger, & Grover, 2012). Roberts *et al*., (2012) clarify that this knowledge flows through the organization and that this flow of knowledge can be facilitated if there are adequate processes and structures that can create efficient mechanisms for its application for useful purposes. In this way, the absorptive capacity depends on the related previous knowledge, the absorptive capacity of the individuals and the past.

Duchek (2013) points out that the definitions used, their components, antecedents and results are heterogeneous, in which researchers treated specific routines that constitute the absorptive capacity as a black box. However, despite the differences, all concepts understand the absorptive capacity as an ability to respond quickly in changing environments. And, therefore, Duchek (2013) proposes a practice-based perspective because of providing and an alternative approach to analyzing absorptive routines, which provides researchers with a better understanding of what the organization's members are doing and how the organization works.

The speed with which external and internal information is accessed by fuel distributors has been increasingly important to add value to the products and/or services offered. In the current dynamics of the fuel market, the ability to absorb data, transform it into information and generate knowledge is essential for companies in this segment. Thus, it is through fuel distribution processes and routines that these companies acquire, assimilate, transform and exploit knowledge. Based on these considerations, the following hypothesis was formulated: **H2: Dynamic Capabilities has a positive impact on absorptive capacity.**

2.3 Articulation between absorptive capacity and operational performance

Taking into account that the purpose of the absorptive capacity is to apply acquired information externally for commercial purposes (Cohen & Levinthal, 1990) and since ACAP helps organizations to develop a competitive differential (Zahra & George, 2002; Leonard-Barton, 1992; Van Den Bosch, Volberba, & De Boer, 1999; Flatten, Greve, Zahra, & Brettel, 2011), performance is a recurring variable in most research in the field of strategic management and is of interest to both researchers and managers. Regarding their investigation, researchers have conceptualized and measured performance in different ways, depending on the research questions, the disciplinary focus and the availability of data.

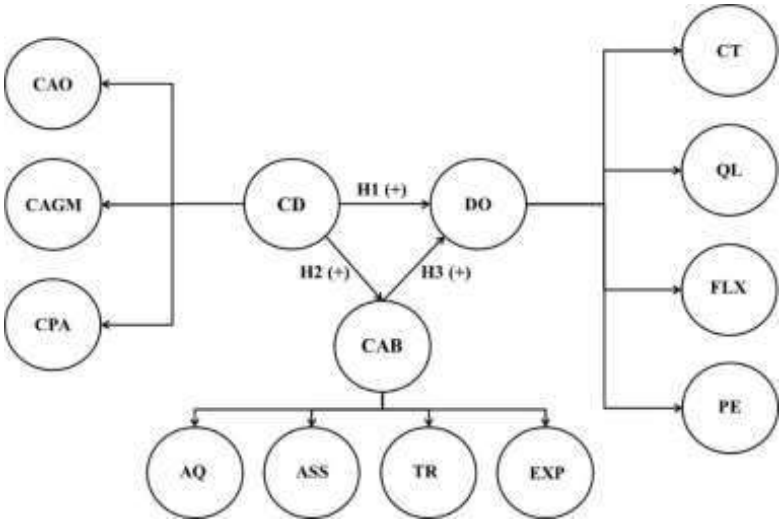
Although this relationship between absorptive capacity and performance has already been studied in previous studies (Bergh & Lim, 2008; Kostopoulos, Papalexandris, Papachroni, & Ioannou, 2011), few studies have applied a multidimensional approach, which allows us to analyze each particular dimension of ACAP along with the small amount of research that somehow links ACAP to operational performance. According to Zahra and George (2002) to improve performance, organizations must develop and manage all dimensions of ACAP simultaneously. In other words, the ability to acquire and assimilate external knowledge can enable the company to create a new and expanded knowledge base. However, this is not enough for the organization to achieve superior operational performance, unless the new knowledge acquired is transformed and applied to new products, processes and/or routines (Zahra & George, 2002).

Van Den Bosch, Volberda and Boer (1999) and Spender (1996) analyze that the company's ability to incorporate new knowledge into its operations can be compromised by the degree of absorptive of the subjects involved with the main routines. Therefore, there may be a compromise in the company's operational performance, with regard to its costs, quality, flexibility and product delivery (in this case, the different types of fuels that are present in the operations of fuel distributors). Although research relating absorptive capacity and performance does not address operational issues,

this research considered performance at the operational level of fuel distributors as a result of absorptive capacity. Thus, the following hypothesis was formulated: **H3: The absorptive capacity has a positive impact on operational performance.**

In order to synthesize the theoretical relationships between the main constructs of this research - dynamic capabilities, absorptive capacity and operational performance - Figure 1 represents a visual scheme of these relationships, as described in the aforementioned hypotheses throughout this section.

Figure 1 - Operational model of the research



Source: authors.

Note: CAO: Ability to seize opportunities; CAGM: Ability to manage threats and changes; CPA: Environmental Perception Capacity; CD: Dynamic Capabilities; CAB: Absorptive Capacity; AQ: Acquisition; ASS: Assimilation; TR: Transformation; EXP: Explotation; DO: Operational Performance; CT: Cost; QL: Quality; FLX: Flexibility; PE: Delivery Time.

3. METHODOLOGICAL PROCEDURES

The research method of this research is quantitative. Its nature is exploratory and descriptive. As the Suape/PE Port Industrial Complex contains only seventeen distributors, the objective was to collect with the teams of professionals from each distributor in order to have more subsidies and evidence about the customer service routines, loading and unloading of vehicles and routing of deliveries, together with elements of absorptive capacity and operational performance. The choice of respondents in this sample, in addition to the accessibility aspect, was based on the hierarchical structure of the fuel distributors, which normally comprise the figures of the general director, the operations director, the commercial director, the operations manager and the base coordinators. The data collection was conducted personally by the researchers through a visit to the distributors.

For the operationalization of the variables and tests of the hypotheses of this research, an instrument consisting of three scales was applied, aimed at coordinators, directors and employees involved with the customer service routines, loading and unloading and routing of deliveries from fuel distribution bases that operate at the Suape Industrial Complex/PE. The scales are of the *Likert* type (1 to 6 points).

To assess the absorptive capacity construct, it was decided to use the questionnaire proposed and evaluated by Jansen; Van Den Bosch and Volberda (2005) and some Jiménez-Barrionuevo indicators; García-Morales; Molina (2011). Regarding the assessment of the dynamic capabilities construct, this research, using the theoretical model of dynamic capabilities developed by Teece (2009), chose to build a scale that measured the sub-dimensions: i) ability to sieze opportunities; ii) the ability to manage threats and changes; ii) ability to perceive the environment. Regarding the measurement of the operational performance construct, it was decided to adapt the questionnaire by Ward et al (1998). Some indicators from the research and theoretical approaches proposed by Garvin (1993) and Slack (1993) for the cost sub-dimension, Garvin (1993) and Hill (1993) for the quality

dimension, by Cox (1989) and Slack (1993), were incorporated for the flexibility sub-dimension and Slack (1993) and Gavin (1993) for the delivery time sub-dimension.

Using the G*Power 3 software (Faul, Erdfelder, Lang, & Buchner, 2007) the minimum sample was estimated in 68 cases to achieve a statistical power of 0.8, with a significance level of 0.05 and an average effect size (Cohen, 1988). In order to obtain this amount of responses from the fuel distributors, the researcher was authorized by the companies to contact employees directly. Thus, it was possible to explain the objective of the second stage of this research and to clarify doubts about completing the questionnaire.

G*Power consists of software used to analyze statistical power in behavioral, social and biomedical research. According to Faul et al. (2007) the power of a statistical test concerns the probability of the null hypothesis being rejected, assuming that the hypothesis itself is, in fact, false (Type II error). The steps that were used to calculate the sample size in G * Power 3 are explained below. According to the model presented in section 3 together with the recommendations of Hair, Hult, Ringle, and Sarstedt (2014) about significance and power (Power = 1 - β erro prob. II) in research in business administration, as well as Cohen's recommendations (1988) on the use of effect size ($f^2= r^2 / 1- f^2$). Therefore: a) α (level of significance): 0.05; b) Statistical power: 0.80; c) effect size: 0.15 / r^2 =13,04%; d) number of predictors: 2. Based on these parameters and applying the "a priori" analysis in the analysis of statistical power, the size of the final sample was 70 cases.

As an analysis technique, confirmatory factor analysis and structural equation modeling were used with the aid of the *Smart pls* version 2 software.

4. DATA ANALYSIS

4.1 Sample description

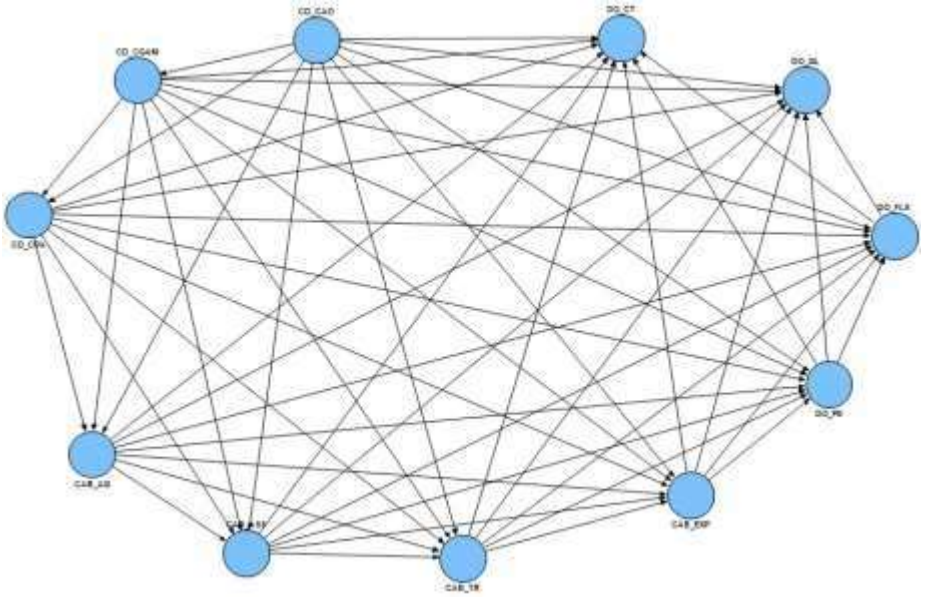
The first part of the questionnaire aimed to acquire personal information about the respondents: **Sex** - (72.9% Male; 27.1% Female); **Education** - (15.7% Medium; 64.3% Graduation; 20.0% Post-Graduation); **Age group** - (25.7% up to 30 years old; 45.7% between 31 and 40 years old; 22.9% between 41 and 50 years old; 5.7% over 50 years old); **Time in the fuel industry** - (35.7% up to 5 years; 38.6% between 6 and 10 years; 15.7% between 11 and 15 years; 10.0% over 15 years); **Hierarchical level** - (4.3% Owners; 8.6% Operations Managers; 35.7% Base Coordinators; 51.4% Analysts).

The second part included information on the operational bases of the companies, whose synthesis is: **Company Size** - (42.9% Small; 25.7% Medium; 31.4% Large); **Number of licensed gas stations** - (28.6% Between 1 and 30; 47.1% More than 30; 24.3% None); **Number of employees in the operational bases** - (8.6% 1 employee; 31.4% 2 employees; 18.6% 3 employees; 41.4% more than 3 employees); **Terminal where it operates** - (31.4% Pandenor; 31.4% Teape; 37.1% Temape); **Distributor Licensing**- (7,1% WD; 8,6% TOTAL; 7,1% TERRANA; 8,6% TORRÃO; 8,6% RAÍZEN; 11,4% IPIRANGA; 11,4% BR DISTRIBUIDORA; 10% PETROBAHIA; 7,1% SETTA; 10% PETROX; 10% FAN).

4.2 Evaluation of the measurement model - initial rounds

With the objective of running CFA on Smart PLS version 2.0, each construct and/or latent variable (LV) was assigned its items and between the constructs structural arrows were placed so that all first-order LVs were connected with everyone, by means of Brown (2006). And the weighting design was based on the PLS (Partial Least Squares) algorithm called "factor weighting scheme" (Hair Jr. et al., 2014). Figure 2 demonstrates this stage of the analysis.

Figure 2 - Confirmatory factor analysis of 1st order variables



Source: authors.

When running the CFA for a model with all the latent variables of the 1st order of the constructs absorptive capacity, dynamic capabilities and operational performance. For the Absorptive Capacity construct, the 1st order LVs "Acquisition - CAB_AQ" with its five indicators, "Assimilation - CAB_ASS" with four indicators, "Transformation - CAB_TR" and "Exploration - CAB" with five indicators each. With regard to the Dynamic Capabilities construct, 1st order LVs "Capacity to Seize Opportunities - CD_CAO" with six indicators, "Capacity to Manage Threats and Changes - CD_CGAM" with seven indicators and "Environmental Perception Capacity - CD_CPA" with five indicators. Finally, in the Operational Performance construct, 1st order VLs “Cost - DO_CT "," Quality - DO_QL "," Flexibility - DO_FLX "and" Delivery Time _PE "with five indicators respectively. In this way, all items on the scale were used and all 1st order LVs were interconnected with arrows in only one direction.

When the factorial loads of the indicators were verified after five rounds of the model, the convergent validity was evaluated, whose premise is related to the items of the latent variables having a high load in their respective LV. Furthermore, by the statistic of the average variance extracted (AVE), whose parameter must be greater than 50%, because in both cases, the higher the factor load in the LV and the percentage of the AVE, a sufficient degree of convergent validity. Therefore, the latent variable explains more than half of the variance of its indicators (Netemeyer, Bearden, & Sharma, 2003; Hair et al., 2014). Through the discriminant validity, it is possible to evaluate the internal consistency of the indicators in relation to their latent variable at the item level, where the factorial loads must be compared with the other loads of the other LVs. As for the level of the construct, according to Hair et al. (2014) composite reliability is the measure used, whose values must be greater than 0.70.

Therefore, in the absorptive capacity construct, it was found that in the first order LVs “Acquisition - CAB_AQ” the indicators “The employees of our unit regularly exchange in other sectors to learn new distribution routines - CAB_AQ_42” and “Our base organizes periodically special meetings with customers or third parties to acquire new knowledge about the distribution routines - CAB_AQ_43 ”presented low factor loads (0.623 and 0.515 respectively) and do not have convergent validity with the LV itself, as well as compromising the value of the AVE for“ Acquisition ” - CAB_AQ ”, which was 45%. In addition, due to its low factor load, when compared to other factor loads (rows and columns) of other LVs, it was found that there are higher loads, which compromises the discriminant validity of the indicator. In the same way, it is possible to see in the 1st order LV

“Assimilation - CAB_ASS” which, even with a 67% AVE, had the indicator “We are slow to recognize changes in our market (for example, competition, regulation, demography) - CAB_ASS_51 ”Very low factor load (- 0.122) which affects the convergent and discriminant validity of this indicator. In the 1st order VL “Transformation - CAB _TR”, it is noted that the indicator “Employees almost never share practical experiences about distribution routines - CAB_TR_65” also had a very low factor load (0.164) and did not fit the validity criteria convergent and discriminant, as well as the indicator “Employees memorize and store newly acquired knowledge about distribution routines for future use - CAB_TR_63” (0.782) with inadequate discriminant validity criteria. Finally, in the first order LV “Explotation - CAB_EXP”, regarding the indicator “Our base has difficulties to implement new services - CAB_EXP_74”, the factor load was also not adequate (-0.332) and, like the other indicators mentioned, did not fit the convergent and discriminant validity criteria.

In the dynamic capabilities construct, the 1st order LV “Capacity to Seize Opportunities - CD_CAO” presented the indicator “We choose the limits of performance of our company - CD_CAO_13 with a factor load that could be considered for the composition of the measurement model (0.642), however even with a stroke of 54% (adequate convergent validity), when considering the discriminant validity, we chose to exclude this variable due measurement problems of the item in relation to LV, such as the indicator “We constantly establish new processes of distribution routines - CD_CAO_16” with factor load (0.731) within the parameters, but with unsatisfactory discriminant validity. Regarding the 1st order LV “Threat and Change Management Capacity - CD_CAGM” the indicator “Our decisions are decentralized - CD_CGAM_21” revealed a low factor load (0.540), even with a 60% AVE, this indicator is not valid convergent due to higher factor loads in other LVs, as well as the indicators “We apply corporate governance principles in our base - CD_CGAM_24”, “We share the knowledge of distribution routines - CD_CGAM_26” and “We remember the knowledge about distribution routines when we performed them - CD_CGAM_27 ”even with factorial loads considered high (0.760; 0808 and 0.829 respectively) did not meet the criteria of discriminant validity due to the high cross loads when compared horizontally with the loads of the other LVs. Regarding the 1st order LV “Environment Perception Capacity - CD_CPA” it was observed that with regard to the indicator “We have the perception to identify potential market segments - CD_CPA_32”, the factorial load, although adequate (0.766) and AVE of 54 %, this indicator did not meet the criteria of discriminant validity. As well as the indicator “Our suppliers help us to improve our routines - CD_CPA_33”, whose factorial load was not satisfactory (0.579), presenting inadequacies with criteria of convergent and discriminant validity.

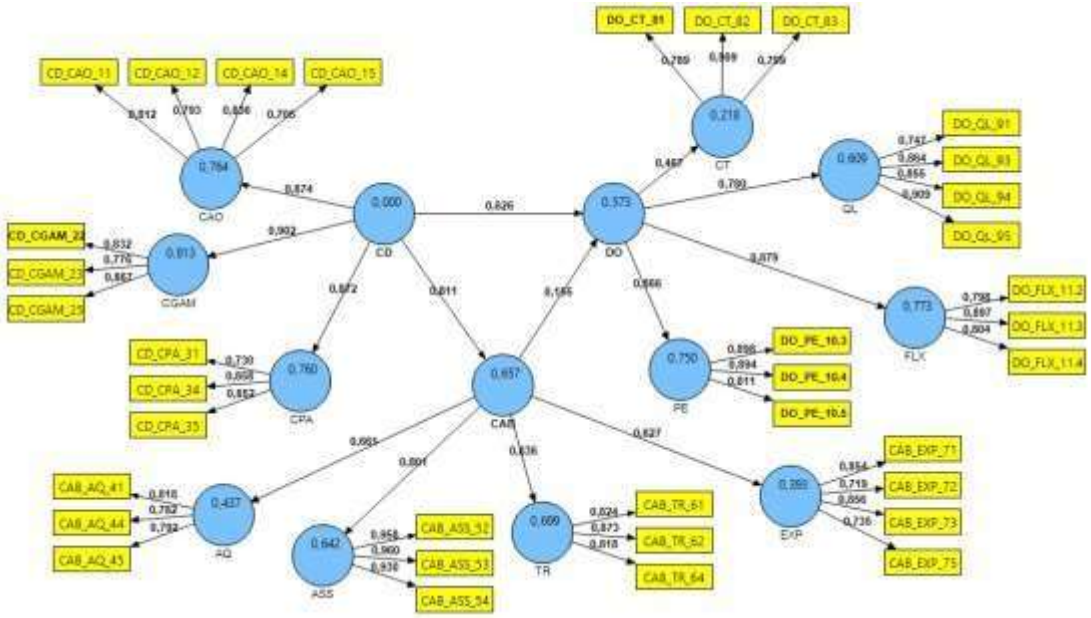
Regarding the operational performance construct, in the 1st order LV “Cost - DO_CT” it was found that AVE resulted in 51%, but the indicators “There are positive effects on the cost of product distribution in relation to the purchased raw material - DO_CT_84” and "There are positive effects on the cost of the service in relation to the product - DO_CT_85" presented factorial loads (0.568 and 0.697 respectively) inadequate in relation to convergent and discriminant validity. Regarding the 1st order LV “Quality - DO_QL”, only the indicator “We checked and tested the quality of our products - DO_QL_92”, although with a high factor load (0.849), revealed inadequate discriminant validity.

As for the 1st order LV “Flexibility - DO_FLX”, it was found that the AVE was 52%, however the indicators “We have the capacity to quickly change the mix of services offered according to our demand - DO_FLX_11.1” and “We have ability to transfer employees to other activities in periods of low demand - DO_FLX_11.5 ”did not obtain desirable factor loads (0.586 and 0.476 respectively) presenting convergent and discriminant validity problems. Regarding the 1st order LV "Delivery Time - DO_PE", the value of the AVE was 59%, but the indicator "We usually deliver products to customers on time - DO_PE_10.1" even with an adequate factor load (0.812), revealed inappropriate discriminant validity. The indicator “Our products do not live in stock for a long time - DO_PE_10.2” showed an inadequate factor load (0.415) and did not fit the criteria of convergent and discriminant validity.

4.3 Evaluation of the measurement model - final round

After eliminating the indicators pointed out in the previous section, the final round was carried out again using the PLS (Partial Least Squares) algorithm for weighting called the "factor weighting scheme" (Hair Jr. et al., 2014). Figure 3 demonstrates this stage of the analysis of the PLS algorithm of that last model, obtaining the following data:

Figure 3 - Final round of the measurement model



Source: authors.

In the absorptive capacity construct, the LV of 1st "Acquisition - CAB_AQ" after the exclusion of the CAB_AQ_42 and CAB_AQ_43 indicators, there was an improvement in the factorial loads of the remaining indicators, as well as an increase in the value of the LV AVE that went from 45% to 63%. In the first order LV "Assimilation - CAB_ASS" after the exclusion of the CAB indicator - ASS_51, there was a considerable improvement in the value of the stroke that went from 67% to 90%. In the 1st order LV "Transformation - CAB_TR", after excluding the indicators CAB_TR_63 and CAB_TR_65, due to discriminant validity and low factor loading, respectively, an improvement in the value of the AVE was also identified, which increased from 52% to 70%. Similarly, in the 1st order LV "Explotation - CAB_EXP", when the CAB_EXP_74 indicator was excluded, it was noticed, as well as the other LVs of the absorptive capacity construct, an increase in AVE that went from 52% to 63% together with the improvement of the factor loads of the respective indicators of this LV, with emphasis on the CAB_EXP_75 indicator.

Regarding the dynamic capabilities construct, the 1st order LV "Ability to Seize Opportunities - CD_CAO" after the elimination of the indicators CD_CAO_13 and CD_CAO_16, it was found that there was an improvement in the value of the AVE, going from 53% to 62%, as well as there were improvements in the factorial loads of the indicators considered in the final measurement model. Regarding the 1st order LV "Ability to Manage Threats and Changes - CD_CGAM", it was noticed that after excluding the indicators CD_CGAM_21, CD_CGAM_24, CD_CGAM_26 and CD_CGAM_27, the value of the AVE improved from 60% to 68% and the others indicators also maintained their initial factor loads, so as not to present inconsistencies in the measurement. Finally, regarding the 1st order LV "Environmental Perception Capacity - CD_CPA", due to the elimination of the indicators CD_CPA_32 and CD_CPA_33, it was found that the AVE increased from 54% to 67% and the other remaining indicators also continued to maintain adequate factorial loads.

Regarding the operational performance construct, the 1st order LV "Cost - DO_CT" after the exclusions of the DO_CT_84 and DO_CT_85 indicators, there was a significant increase in the value

of the AVE that went from 51% to 70%. It is worth mentioning that the DO_CT_81 indicator, which had a factor load below the parameter, achieved an improvement that made it adapt to the desired criteria. In the 1st order LV "Quality - DO_QL", after the exclusion of the DO_QL_92 indicator, there was a small improvement in the value of the AVE that went from 70% to 72%, in addition to the other factorial loads remained satisfactory and these indicators met the necessary criteria for convergent and discriminant validity. About the first order LV "Flexibility - DO_FLX", after the eliminations of the DO_FLX_11.1 and DO_FLX_11.5 indicators, there was a significant improvement in the AVE values, which went from 52% to 69%. In the first order LV "Delivery Time - DO_PE", after excluding the indicators DO_PE_10.1 and DO_PE_10.2, there was also a considerable improvement in the value of the AVE, which went from 59% to 75%, as well as the factorial loads of the indicators that remained in this LV maintained the same values presented in the first rounds.

With regard to composite reliability, all 1st order LVs had values ≥ 0.7. Thus, the convergent validity at the item and construct level are adequate, as well as the discriminant validity at the item level. However, as these procedures were adopted with 1st order LVs, it is necessary to calculate the AVE and the composite reliability for 2nd order LVs. Convergent validity was considered adequate, since all indicators had significant factor loads and the average variance extracted was greater than 0.5. The discriminant validity was also adequate, since the square root of the average variance extracted (AVE) was higher than the correlations between the LVs (Table 1) and the factorial loads higher than the crossed loads. Reliability was considered adequate with values of composite reliability above the minimum standard of 0.7 (HAIR JR. *et al*., 2014).

Table 1 - Correlation matrix between latent variables

2nd Order LVs	Absorptive Capacity				Dynamic Capability			Operational Performance			
1st Order LVs[a]	1	2	3	4	5	6	7	8	9	10	11
1 – Acquisition	**0,794**										
2 – Assimilation	0,320	**0,949**									
3 – Exploitation	0,158	0,344	**0,794**								
4 – Transformation	0,613	0,539	0,316	**0,837**							
5 - Seize Opportunities	0,516	0,454	0,324	0,455	**0,788**						
6 - Threat and Change Management	0,435	0,783	0,515	0,473	0,672	**0,826**					
7 - Perception of the Environment	0,656	0,664	0,430	0,651	0,606	0,716	**0,816**				
8 – Cost	0,544	0,492	0,239	0,484	0,347	0,601	0,643	**0,836**			
9 – Flexibility	0,403	0,222	0,540	0,281	0,561	0,499	0,497	0,401	**0,833**		
10 – Delivery Time	0,339	0,322	0,608	0,213	0,578	0,501	0,468	0,250	0,740	**0,867**	
11 – Quality	0,205	0,373	0,640	0,416	0,596	0,458	0,462	0,058	0,520	0,570	**0,846**
Average Variance Extracted	63%	90%	63%	70%	62%	68%	67%	70%	69%	75%	72%
Composite Reliability	0,837	0,965	0,872	0,876	0,867	0,866	0,856	0,874	0,872	0,901	0,909
***Cronbach's* Alfa**	0,721	0,945	0,810	0,789	0,796	0,768	0,744	0,780	0,779	0,837	0,866

2nd Order LVs[b]	1	2	3
1 – Absorptive Capacity	**0,742**		
2 – Dynamic Capability	0,701	**0,883**	
3 – Desempenho Operacional	0,429	0,693	**0,767**
Average Variance Extracted	53%	78%	59%
Composite Reliability	0,817	0,914	0,843
***Cronbach's* Alfa**	0,852	0,889	0,780

Source: authors.

Note[a]: The diagonal values refer to the square root of the AVE for first order VLs.

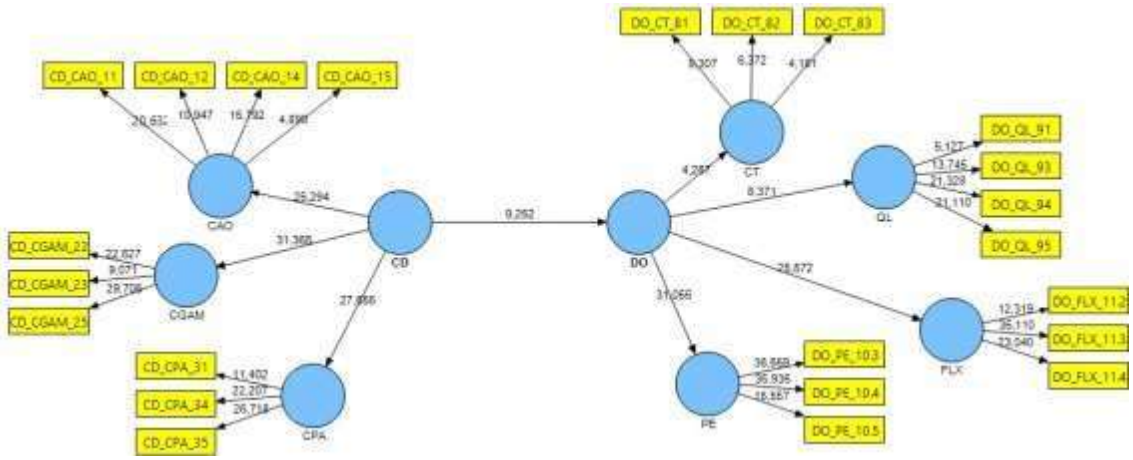
Note[b]: The diagonal values refer to the square root of the AVE for 2nd order VLs.

4.4 Evaluation of the structural model

The structural model was estimated using the Partial Least Squares Path Modeling (PLS-PM) method because it is considered more suitable for exploratory-descriptive studies. In addition, in this step the design for weighting was based on the "path weighting scheme" algorithm. That said, the evaluation of the structural model involves the analysis of some elements: a) Structural coefficients; b) Direct, indirect and total effects; c) R^2 and adjusted R^2; d) Multicollinearity; e) Relative importance of predictors; f) Validity of criteria: g) Nomological validity.

To evaluate the relationships between the dynamic capabilities, absorptive capacity and operational performance constructs, it was decided to run the structural model in two ways. The first way analyzing the direct relationship between dynamic capabilities and operational performance. And the second evaluating the effects of absorptive capacity as a mediating variable. Thus, Figure 4 presents the t-values of the structural model for the relationship between dynamic capabilities (DC) and operational performance (DO).

Figure 4 - Model t-values between dynamic capabilities and operational performance



Source: authors.

Note 1: T-values estimated by bootstrap with 1000 resamples and option construct level change.

Note 2: CD and DO are 2nd order LVs. Soon its items are plots obtained based on the factorial scores calculated in the initial rounds.

Table 2 shows the relationship between dynamic capabilities and operational performance. From this relationship, it was found that the dynamic capabilities was significant (0.743; $p < 0.05$) and an effect size that can be considered average in Cohen's classification (1988). The VIF value was adequate and it was also found that only dynamic capabilities explains 54.6% of operational performance.

Table 2 - Results of the structural model between dynamic capabilities and operational performance

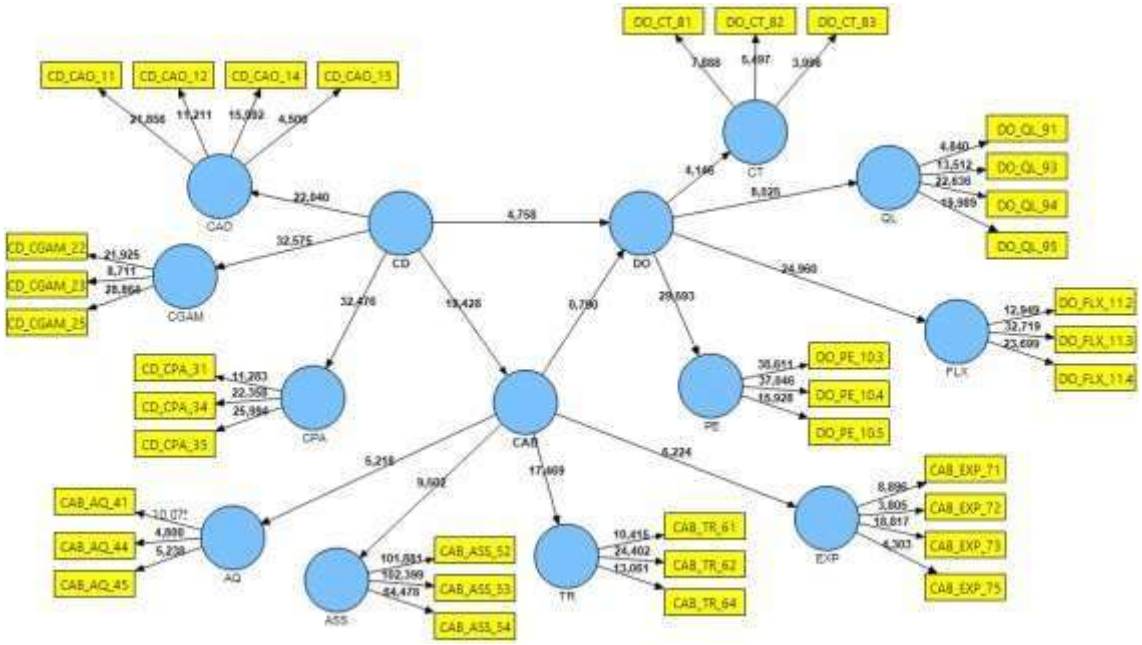
Structural Relation	VIF	Structural Coefficient	Standard Error	t-value	p-value	R^2	R^2 adjusted
CD -> DO	1,00	0,743	0,0872	8,529	0,000	55%	54,6%

Source: authors.

Note 1: T-values estimated by bootstrap with 1000 resamples and option construct level change. Caption: CD = Dynamic Capabilities; DO = Operational Performance.

After analyzing the relationship between the variable's dynamic capabilities and operational performance, the structural model was estimated with the inclusion of the mediator variable absorptive capacity. Figure 5 shows the t-values of the structural model for the relationship between dynamic capabilities (CD) and operational performance (DO) with the mediation of the variable absorptive capacity (CAB).

Figure 5 - Model t-values with absorptive capacity mediation



Source: authors.
Note 1: T-values estimated by bootstrap with 1000 resamples and option construct level change.
Note 2: CD, CAB and DO are 2nd order LVs. Soon its items are plots obtained based on the factorial scores calculated in the initial rounds.

In Table 3, after the insertion of the absorptive capacity mediator variable, it was found that the relationship between dynamic capabilities and operational performance remained significant (0.629; p <0.05), but there was a reduction in the degree of explanation of the operational performance (r^2 = 54.7%). The relationship between absorptive capacity and operational performance was not significant (0.142; p> 0.05) and, therefore, there was no indirect effect on the operating performance explanation coefficient. However, regarding the relationship between dynamic capabilities and absorptive capacity, it was observed that this was significant (0.811; p <0.05). It should also be noted that the VIF value was adequate, not showing strong signs of multicollinearity.

Table 3 - Results of the structural model with absorptive capacity mediation

Structural Relation	VIF	Structural Coefficient	Standard Error	t-value	p-value	$\Delta R^2 = \beta * r$	R^2	R^2 adjusted
CD -> DO	1,9	0,629	0,1321	4,758	0,00	50,9%	56%	54,7%
CAB -> DO	1,6	0,142	0,1799	0,789	0,43	9,2%		
CD -> CAB	1,00	0,811	0,0417	19,428	0,00	65,7%	65,7%	65,2%

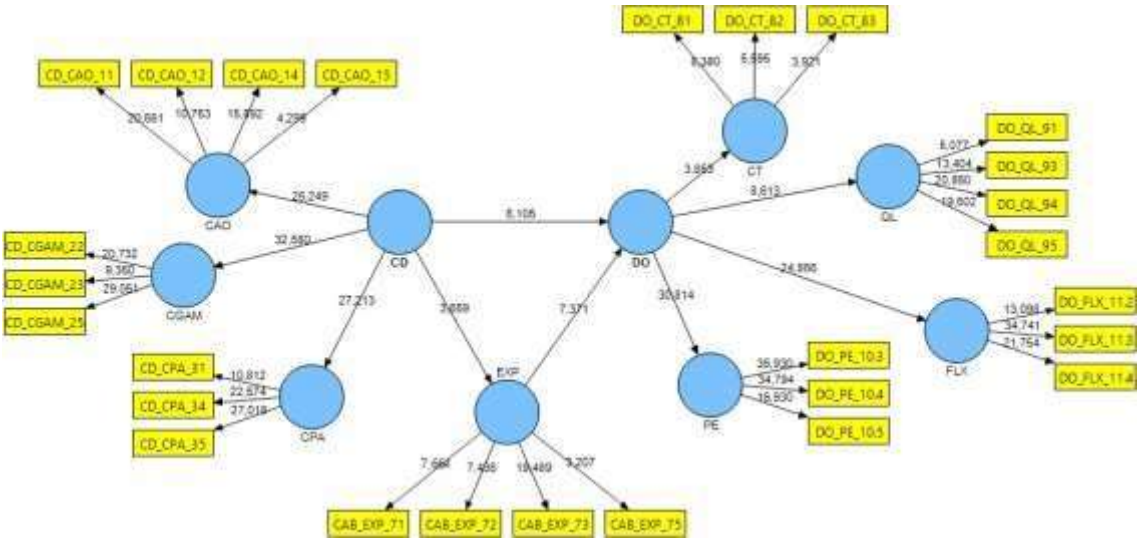
Source: authors.
Note 1: T-values estimated by bootstrap with 1000 resamples and option construct level change. Caption: CD = Dynamic Capabilities; DO = Operational Performance; CAB = Absorptive Capacity

4.5 Structural model evaluation - alternative model proposal

After verifying that the mediation of the absorptive capacity in the relationship between dynamic capabilities and operational performance was not significant, it was decided to carry out some tests directly considering the first order LVs of the potential dimensions and the realized one of these constructs. Thus, it was identified that the dimensions of the potential absorptive capacity (acquisition and assimilation), when running the bootstrap, did not show significance in their respective structural coefficients. In the absorptive capacity performed, the transformation dimension,

like the other dimensions, did not present significant structural coefficients. However, in the exploitation dimension, also belonging to the absorptive capacity performed, the coefficients were adequate and significant. Thus, for the purpose of the alternative model, only this dimension was considered, as discussed in the model shown in Figure 6.

Figure 6 - Model t-values with exploitation mediation



Source: authors.

Note 1: T-values estimated by bootstrap with 1000 resamples and option construct level change.

Note 2: CD and DO are 2nd order LVs. Therefore, its items are plots obtained based on the factorial scores calculated in the initial rounds. EXP is a 1st order LV referring to the dimension of the absorptive capacity performed.

Table 4 - Results of the structural model with exploitation mediation

Structural Relation	VIF	Structural Coefficient	Standard Error	t-value	p-value	$\Delta R^2 = \beta * r$	R^2	R^2 adjusted
CD -> DO	1,29	0,531	0,0869	6,104	0,00	39,4%	70,3%	69,5%
EXP -> DO	1,29	0,444	0,0603	7,370	0,00	30,9%		
CD -> EXP	1,00	0,476	0,1302	3,659	0,00	22,7%	22,7%	21,5%

Source: authors.

Note 1: T-values estimated by bootstrap with 1000 resamples and option construct level change. Caption: CD = Dynamic Capabilities; DO = Operational Performance; EXP = Exploitation

In Table 4, after the tests were carried out with all first order LVs of knowledge absorptive capacity, 'exploitation' was the only LV that presented itself as significant. Thus, in the relationship between dynamic capabilities and operational performance, it was found that there was significance (0.531; p <0.005). In the same way that the relationship between the exploitation dimension and operational performance was significant (0.444; p <0.005). The total effect was 0.742 and the indirect effect was 0.211. Therefore, the mediation relationship of this dimension was confirmed. Regarding the relationship between dynamic capabilities and exploitation, there was significance (0.476; p <0.05) in the structural coefficient of these dimensions. It is also noteworthy that the VIF value was also adequate for testing this alternative model.

Do From the point of view of criterion validity, when we consider the relationship between dynamic capabilities and absorptive capacity, it was noticed that there is a high association between these LVs. This corroborates the studies of Jansen, Van den Bosch and Volberda (2006), as well as adapting the theorizing of Zahra and George (2002). Also, with regard to criterion validity, in the relationship between dynamic capabilities and operational performance, there was also a high association between these LVs, in line with the research by González-Benito (2005). However, when

observing the relationship between absorptive capacity and operational performance, it was identified that there were no statistical subsidies to confirm the hypothesis between these LVs.

From the point of view of nomological validity, it was identified that in the complete model the LV dynamic capabilities adjusted as expected and outlined in the conceptual model. In this way, its relationship with LVs absorptive capacity and operational performance were relevant. However, when considering the LV absorptive capacity, the model was not shown to be adequate, since of the four dimensions (acquisition, assimilation, transformation and exploitation) that are components of this LV, only the exploitation was significant in the research model.

5. DISCUSSION OF THE RESULTS

Teece (2009) points out that the ability to take advantage of opportunities is related to the design of solutions for clients, the choices of company actions, the routines that assist in decision making and the routines as mechanisms of customer loyalty. The author warns that to provide solutions to customers it is necessary to incorporate elements that define the organization's business model.

As for the management of threats and changes, the data revealed that small distributors, in comparison with medium and large ones, presented inferior performances when it comes to acting together with suppliers and partners in managing the movement of fuels, the centralization of activities at integration of operational routines, adaptability to new procedures and task implementations. Medium and large distributors have greater control and monitoring of potential changes that can be implemented by regulatory bodies, as well as being more efficient in relation to the risks inherent in operating procedures and competition with other competitors.

With regard to the ability to perceive the environment, there was a predominance of medium and large distributors aimed at establishing solid commercial relationships with suppliers and partners regarding the improvement of operational fuel distribution routines. This can be seen in the signing of specific contracts in the restriction of operating units, exclusively for loading and unloading activities and the strategic performance of sales teams in the macro-regions of the state of Pernambuco.

Boyer and Lewis (2002) illustrate that competitive priorities are linked to the focus of the strategic positioning of market organizations. In this sense, Slack et al (2002) mentions that these priorities are linked to the operational capabilities of companies. In this way, operational performance, in terms of cost, quality, flexibility and delivery time, means that organizations that manage to have a balance in the management of these four capabilities tend to have a high degree of competitiveness.

Regarding the absorptive capacity, in its acquisition dimension, it was possible to ascertain in the first that fuel distributors seek to direct some investments to promote training programs, with the purpose of improving distribution routines, as well as making employees have technical mastery over business processes.

In the assimilation dimension, the presence of some characteristics was verified, such as the need to obtain knowledge immediately, possibilities of integration and standards that would facilitate learning. The fuel distributors, as they are inserted in an environment with a high flow of operations, demand that their employees be able to assimilate as efficiently as possible all the details that involve the distribution routines.

The transformation dimension revealed that the greatest difficulty in reflecting the acquired and assimilated knowledge is concentrated in small distributors, since they are not able to more effectively recognize external knowledge to add value in operations and are unable to transform this knowledge to adapt quickly market requirements. Zahra and George (2002) point out that the transformation process refers to the ability of organizations to develop and adapt their routines and processes to facilitate the integration of knowledge already learned. Thus, this ability allows organizations to recognize new ways of adapting to new knowledge arising from environmental demands.

In the exploitation dimension, the distributors presented some characteristics, such as the plastering of routines and the adequacy of activities. In relation to the plastering of routines, loading

and unloading is the main routine within the fuel distribution activity. This routine is characterized by being standardized and common to all organizations inserted in the Suape / PE Industrial Complex.

6. CONCLUSIONS

The main objective of this research was to analyze the influence of dynamic capabilities, mediated by the knowledge absorptive capacity and the result of the operational performance of the fuel distribution bases in the Suape/PE Port Industrial Complex. To achieve this central objective, three more specific objectives were formulated which sought to describe and understand the characteristics of the predominant dynamic capabilities in the routines selected for study, the characteristics of the absorptive capacity associated with the organizational routines and the operational performance indicators that are used to evaluate these routines.

Regarding the characteristics of the dynamic capabilities prevalent in the routines selected for this research, it was found that in the routine of customer service, distributors seek to insert elements that can add value in the distribution operation during the product negotiations. In other words, it was found that competition for price and term is intense and makes it possible for resellers who do not have ties with a certain brand to purchase products at any fuel distributor installed in the Suape/PE Complex.

Regarding the characteristics of the absorptive capacity associated with organizational routines, it was found that in relation to the acquisition dimension, investments are made by the distributors in training and personnel training. In addition, it was found that the use of manuals and standardizing instruments also helps in the execution of distribution routines. It was observed that the versatility of the functions is also a predominant characteristic in the distributors.

Regarding the operational performance indicators used to evaluate these routines, it was identified that in the cost dimension, distributors seek to define adequate costing margins by activity, align costs together with suppliers and customers, seek alternatives to reduce costs in operations and constantly control costs. fuel sales costs. In terms of quality, one of the main procedures that generate confidence in the relationship with resellers is the performance of tests that monitor the product's situation. Regarding flexibility, it was evidenced that the distributors facilitate payment terms, mainly for non-flagged resellers due to the possibility of them buying products from other companies. With reference to the delivery time, the distributors formulate their respective strategies according to the type of freight sold along with the possible routes. In this case, resellers who opt for FOB freight are responsible for the removal of the products, as well as for establishing the routes that are most convenient to them.

This research contributed from the academic point of view, with the investigation of the constructs dynamic capabilities, absorptive capacity and operational performance, analyzed from the perspective of organizational routines, as well as the use of absorptive capacity as a mediating variable allowed to discover that not all dimensions model are applied if we consider the characteristics of the environment in which the companies operate. As future recommendations, it is indicated to consider other distributors for new studies, to compare operational routines between distributors located in other complexes in Brazil and to promote studies in other areas of the fuel sector, such as in the production segment, in the resale segment and in the scope of consumers.

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