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DYNAMIC CAPABILITY, ENVIRONMENTAL UNCERTAINTY AND ORGANIZATIONAL PERFORMANCE: AN ANALYSIS OF MICRO AND SMALL-SIZED AGROINDUSTRIES IN SOUTHERN BRAZIL

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1. INTRODUCTION

Some organizations stand out from others, even in similar backgrounds. The understanding of how these organizations obtain such competitive advantage is a motivating subject of research in the field of strategy. The motivating subject of research in the strategy field is the understanding of how these organizations obtain a competitive advantage. In order to explain this inequality, the Resource-Based View theory (RBV) emphasizes the generation of competitive advantage through the strategic use of the organization's internal resources (Barney, 1991). The dynamic capabilities theory arises as an evolution of the RBV when inserting the organizational environment in its analysis, therefore, it seeks to explain the competitive advantage in turbulent environments (Barreto, 2010).

Productive dynamic capability is one of the specific capacities that emerged from the general theory of dynamic capabilities. Its purpose is the search for knowledge of the internal skills that are connected to production. Thus, the organization can forestall the adaptations of the productive processes, and consequently drive advantage over the market. A research tool validation on productive dynamic capability, created and validated by D'Avila and Silveira-Martins (2017), opens a gap in the literature for the propagation of studies that approach the theme.

However, it is necessary to extend beyond investigating in isolation the dynamic capabilities, it is necessary to analyze the relations with the external environment to the organization and with the organizational performance. Therefore, studies that support in understanding the relationship between productive dynamic capability and organizational performance, and how the dimensions of environmental uncertainty mediate this relationship, so these studies are a response to a better understanding of dynamic capabilities. Researches of this type are necessary to enlighten how a company adapts and how it stands out (Alves, Barbieux, Reichert, Tello-Gamarra & Zawaslak, 2017).

The agroindustry segment deals with difficulties and uncertainties that impact on its survival and performance. The agroindustries must constantly adapt to the laws that pass through the sector, as well as the seasonality and shelf-life of their raw material (Fernandes, 2014). For the reason, they are prone to develop their productive dynamic capability to maintain a favorable performance and competitive advantage over their competitors.

Small and medium-sized enterprises play a key role in economic development (Rojo, Ashil & Chadee, 2017). As well as agroindustries, which support the generating jobs and income to the families of their region, and also the maintenance of families in the field (Rossatto & Machado, 2017). This is evident in the announcement by the Advanced Studies Center in Applied Economics (CEPEA) (2018), of a growth in production and employment in the agroindustry sector since the second half of 2017.

Agribusiness is an important influencer of the Brazilian economy, agroindustries are responsible by part of this influence. Brazil had about 571,643 rural establishments with processing, 23.3% of them were located in the Brazilian southern region, behind only the Northeast region with 49% of establishments (Brazilian Institute of Geography and Statistics (IBGE), 2006).

According to Brazilian Institute of Geography and Statistics (IBGE, 2017) data, rural agroindustries in Brazil were responsible for the production of 152,694 liters of cane brandy, 27,760 tons of jams and jellies. The states that make up Brazilian southern are the Rio Grande do Sul, Santa Catarina and Paraná and it was responsible for the production of 96% of grape

wine (108,675 liters), 30% of canned vegetables (11,520t) and, by 26% of sausage production (9,467t), compared to national production according to IBGE (2017).

In view of the above, this research seeks to verify the hypothesis that the productive dynamic capability of small and micro-sized agroindustries has a positive effect on their performance and, when this association is mediated by the factors of environmental uncertainty - complexity and dynamism - there will be interference in correlation.

Based on the recommendations of Fischer, Gebauer, Gregory, Ren and Fleisch (2010), Silveira-Martins (2012), Freitas, and Salermo (2018) this research is made upon the need for discoveries about dynamic capabilities, for their better understanding such as new evidence on the relationship between dynamic capability and performance (Takahashi, Bulgacov & Giacomini, 2017). On the need for studies involving environmental influences in organizational analysis (Aragón-Correa & Sharma, 2003; Escobar, 2012; Shoham, Asseraf, Lev, & Fiegenbaum, 2017).

2 LITERATURE REVISION

2.1 Productive Dynamic Capability

The dynamic capabilities theory emerges from the gap left in the RBV theory, advances in considering the organizational environment in the achievement of competitive advantage inserting robustness to empirical research in the last decades (Ambrosini & Bowman, 2009; Eisenhardt & Martin, 2000; Wang & Ahmed, 2007).

The commonly used definition for dynamic capabilities was made by Teece, Pisano, and Shuen (1997), seen as the company's ability to integrate, construct, and reconfigure its internal and external competencies in changeful environments in order to drive competitive advantage.

Such capabilities can still be considered as the outcome of the sum of other company-specific capabilities and their routines (Andreeva & Chaika, 2006; Eisenhardt & Martin, 2000; Freitas & Salermo, 2018; Wang & Ahmed, 2007). The efficiency of organizations will depend on how they are able to combine their different capabilities (Alves et al., 2017).

Based on the studies on dynamic capabilities, D'Avila and Silveira-Martins (2017) validated a measurement scale for productive dynamic capability. The authors carried out their research with microbreweries in several regions of Brazil, where they identified eight productive capabilities: (a) use of automated equipment for production; (b) use of technological equipment for production; (c) skilled labor for production; (e) product diversity; (f) distribution; (g) optimized production; (h) control in the production process; (i) does not lose quality in any of the productive processes.

The productive dynamic capability is defined by D'Avila and Silveira-Martins (2017, p. 04), as the set of all internal capabilities of the organization linked to the productive system, from its beginning to the end, and the management of their forces is concise in response to environmental uncertainty.

Among the variables that make up this capability is the automation of production, the use of technological equipment for production, skilled labor, which result in optimized production, guaranteeing the quality of the products (Fleury, 1989), they come from the component that guarantees not to lose the quality in any production process.

The sort of products may be able to generate better economic performance for the company (Grant & Jammine, 1988). The distribution channels of this production must meet the customer demands, delivering the products or services with excellence, in the right place and at the right time. (Costa & Almeida, 2007). Meeting customer demands and positively impacting their brand and loyalty (Yoo, Donthu & Lee, 2000).

Process innovations linked to machinery and equipment refers to the introduction of new or improved production methods (Snyder, Witell, Gustafsson, Fombelle & Kristensson,

2016). These innovations influence the reduction of losses in the production cycle, the greater productivity and use of the product and the quality of products (Snyder et al., 2016).

The author Mundim et al. (2002) report that in order to be effective and efficient in production it is essential to have a qualified and multifunctional team, interacting in all production processes, developing products with the specifics required by the market. The availability of skilled labor may also increase the likelihood of successful implementation of innovative activities (Collins & Reutzel, 2017).

The control of the production process seeks to meet the requirements of production to the maximum extent possible, with a flow of information sharing between departments, with the objective of ensuring a more efficient production (Bonney, 2000). Based on these eight variables, the construct productive dynamic capability seeks to identify if the company is using its internal capabilities linked to the production to improve two strategies and consequently their performance.

2.2 Environmental Uncertainty

To remain visible and competitive, companies must continually adapt to the environment in which they are placed (Duncan, 1972). The perception of the environment is influenced by the uncertainty of the environmental organization context, which may affect its results (Boyd & Fulk, 1996; Dessel & Beard, 1984; Gardelin, Rossetto & Verdinelli, 2013; Priem, Love & Shaffer, 2002).

Environmental uncertainty is made up by the need of information on environmental factors and the lack of foreseeability of the outcome of a given event (Aldrich & Pfeffer, 1976; Duncan, 1972; Goll & Rosheed, 2005). According to Teece, Peteraf, and Leih (2016), the degree of uncertainty of organizations has increased as the economy becomes more advanced allowing the opening up new business opportunities everywhere.

Uncertainty is dependent on two factors, the dynamism and complexity of the environment (Cannon & St. John, 2007; Dess & Beard; 1984; Duncan, 1972). The environment dynamism is understood as the unforeseeability and the swift change of elements such as customer needs, technology, suppliers, competitors' field of performance, among others (Carvalho & Rossetto, 2014; Dess & Beard, 1984; Kovach, Hora, Manikas & Patel, 2015; Mikalef & Pateli, 2017; Neirotti & Raguseo, 2017).

The environment complexity can be considered as the diversity of factors, or information that influences the processes of decision-making (Dess & Beard, 1984; Duncan, 1972; Mikalef & Pateli, 2017). Increasing the number of these factors occurring in a given context may increase the difficulty of managers to understand their impact on their company (Harrington & Kendall, 2007).

2.3 Relationship between Hypotheses and Constructs

Dynamic capabilities enable organizations to outperform their competitors in the long run (Silveira-Martins & Zonatto, 2015; Wang & Ahmed, 2007; Wang, Senaratne & Rafiq, 2015). The literature presents the results of the relation of several specific dynamic capabilities with the performance (Qureshi, Aziz & Mian, 2017; Silveira, 2017; Wu, 2006).

In the study carried by Hernández-Perlines, Moreno-Garcia and Yáñez-Araque (2017), the dynamic absorptive capability step in the relation between performance and entrepreneurial orientation. According to Mikalef and Pateli (2017), in their study, found that the relation between dynamic IT capabilities and organizational performance steps in by organizational agility. From the reports, the research verified the relation between the performance and productive dynamic capability of agroindustries: H_1: Results show a positive correlation between performance and productive dynamic capability in rural agroindustries.

It is necessary to take into account that environmental uncertainty can affect the strategy formulation, thus interfering in the manager decision-making, who need to adopt measures to overcoming environmental turbulence (Smart & Vertinsky, 1984). However, it is possible to influence the performance of organizations (Gardelin et al., 2013; Lumpkin & Dess, 1996; Milliken, 1987; Priem et al., 2002).

Understanding environmental uncertainty belongs to the organization's manager (Silveira-Martins & Tavares, 2014). Such an understanding influences strategies adopted (Aldrich & Pfeffer, 1976; Aragón-Correa & Sharma, 2003; Carvalho & Rossetto, 2014). Success in perception is necessary to ensure superior performance in organizations (Boyd & Fulk, 1996; Priem et al., 2002; Silveira-Martins & Rossetto, 2018). In the light of Silveira (2017) has identified that the level of managers' perception of environmental uncertainty is proportional to the level of performance of the organization.

According to Schilke (2014) some suggests in his study that dynamic resources may be able to generate competitive advantage for the organization, according to the current level of environmental dynamism. Thus, environmental dynamism can increase the development, importance and use of dynamic capabilities, encouraging the use of dynamic resources in these contexts (Barbero, Ramos & Chiang, 2017; Frank, Güttel & Kessler, 2017).

Highly dynamic markets can affect with organizational performance, for example, in the innovation capability, efficiency and flexibility of production (Wu, 2006). In their study Akgün, Keskin and Byrne (2008) found that the relation between emotional ability and organizational performance was influenced by environmental dynamism. As the way in which managers understand environmental complexity may reflect on company performance (Boyd & Fulk, 1996).

The two factors that make up environmental uncertainty were analyzed separately, dynamism and complexity, in order to individually identify their influences. Following the scope and definition criteria set out it is sought to verify: H_{2a}: The environmental complexity step in between productive dynamic capability and organizational performance in the southern Brazil agroindustry.; H_{2b}: The environmental dynamism step in between productive dynamic capability and organizational performance in the southern Brazil agroindustries.

3. METHODOLOGY

As quantitative the research is characterized, it uses the research technique survey and non-probabilistic sample for convenience. The sample is made up of 138 agroindustries of micro-sized (131 agroindustries) and small-sized (7 agroindustries) of the states of Rio Grande do Sul (118 questionnaires), Santa Catarina (17 questionnaires) and Paraná (3 questionnaires). The sample size is in accordance with the sample standards reported by Hair, Black, Babin, Anderson, and Tathan (2009).

The instrument of data collection is made by the adaptation of an instrument developed by D'Avila and Silveira-Martins (2017). Instrument validated by Carvalho and Rossetto (2014), already used by other researchers such as Müller (2016) and Silveira (2017), was used to measure the perception of environmental uncertainty. We used scales of 1 (minimum agreement/perception) to 6 (maximum agreement/perception) points for both constructs where the interviewed should report about their agreement/perception regarding the affirmative.

The organizational performance construct was measured by adapting the instrument proposed by Gupta and Govidarajan (1984), already validated with the adaptations by Muniz Filho (2011), Silveira-Martins (2012), Silveira-Martins, Rossetto and Añaña (2014), Lizote and Verdinelli (2014, 2015), Müller (2016), Silveira (2017), Klinger (2018). Two parts make up the construct, one related to the importance of each item from the manager's viewpoint and the second related to the satisfaction of a given item in relation to its agroindustry the items were the same in both parts. Therefore, a scale of 1 (minor importance/satisfaction) was used to 6

(major importance/satisfaction) that the item represents. For the data analysis, these two values were multiplied, according to the equation proposed by Gupta and Govidarajan (1984).

A pre-test was performed with three professionals from the area, prior to data collection to verify the questionnaire understanding. The questionnaire was applied after making the necessary adjustments in the instrument of collection. The data collection was performed with agroindustries managers in loco in agroindustries or at exhibitions totaling 96 questionnaires collected in this way. And via email totaling 42 questionnaires collected, out of a total of 267 questionnaires sent via email.

Although the instruments used have already been the subject of further research, we chose to verify the internal consistency of the entire scale using Cronbach's alpha measure. According to Hair et al. (2007), this is the most widely used measure and the minimum value accepted to confirm the reliability should be >0.6, which was confirmed for all constructs of this research, certifying the suitability of scale.

Following the recommendations of Hair et al. (2009) the following adjustment items were used to carry out the confirmatory factorial analysis; root means a square error of approximation (RMSEA≤0,100), Tucker-Lewis index (TLI≥0,900), which precedes the comparative adjustment index (CFI≥0,900). According to Hair et al. (2009), the expected values should not be considered absolute, they serve only as a horizon for the best model fit.

Considering that the chi-square test (x^2) is sensitive to sample size (Fan, Thompson & Wang, 1999; Hair, Anderson, Tatham & Black, 2007), for samples close to 100 it can cause deviations in results, and failure in other validations (Hair et al., 2007) In addition to the MPlus® software, it was pointed out that the x^2 values of database could not be considered as absolute.

The Microsoft Excel 2010 software MPlus® version 7 and AMOS 16.0 were used for tabulation, statistical analysis, and graphical data construction respectively.

4. DATA ANALYSIS

The individual factorial analysis of each model construct was performed in order to confirm the theory applied in each construct (HAIR et al., 2009). And finally, the confirmatory factor analysis for the complete model.

The analysis of productive dynamic capability constructs revealed CFI (0.748), TLI (0.647), with values outside the target standards (≥ 0.900), as well as the RMSEA (0.228) higher than expected (≤0,100). In order to test an optional model for the construct to identify a model that best fits the search. Simulations were performed disregarding the variables PCD1 (0.677), PCD2 (0.530), PCD3 (0.440), PCD4 (0.584), PCD5 (0.653).

In the optional model the variables coefficients were statistically significant in addition to increasing their loads, PCD6 (from 0.711 to 0.756, p-value= 0.000 <α = 0.05), PCD7 (from 0.726 to 0.848, p-value= 0.000 <α = 0.05), PCD8 (from 0.635 to 0.711, p-value= 0.000 <α = 0.05). As well as the CFI (1,000≥0,900), TLI (1,000≥0,900) and RMSEA (0,000≤0,100) indicators presents a good fit for the construct.

Although the CFI and TLI rates of the optional model have maximum quality values, it is not considered to be transgressors (Hair et al. 2009). Thus, the optional model provides the best option for carrying out the research, although it presents RMSEA rates (0.000) in expected patterns (≤0,100).

The environmental complexity construct revealed that the confirmatory analysis has some adequate indicators CFI (1,000≥0,900), TLI (0.999≥0.900), RMSEA (0.012≤0.100), but simulations were performed to test a model that best fits the research. However, the coefficients of the variables were analyzed to reduce the variables of lower coefficient (Hair et al., 2009), to test an optional model.

To the optional variable the model COM3 (0.475) was disregarded, because it has provided a factorial load lower than another variable, the optional model provided rates with better adjustment than the initial model CFI (1,000≥0,900), TLI (1,000≥0,900) and RMSEA (0.000≤0.10). The considered variables behave in a hasty manner in the optional model COM1 (0,705, p-value= 0.000 <α = 0.05), COM2 (0.680, p-value= 0.000 <α = 0.05) and COM4 (0.631, p-value= 0.000 <α = 0.05). It was provided by analysis.

The coefficients of the indicators were analyzed, p-values, divergence, and error in order to identify possible abnormalities in variables that made the maximum adjustment, so that this event has occurred. No disparities were identified with the literature, however, the optional model will be used for the environmental complexity construct, since it presents a better adjustment.

The environmental dynamism constructs analysis shown a CFI indicator (0.916≥0.900), but TLI (0.860) lower than expected (≥0,900). Also, the RMSEA rates (0.153) was higher than expected (≤0,100). Therefore, the analysis of the coefficients of each one variable that make up the dynamism construct was carried out with the purpose of performing simulations to the construction of an optional model that best fits the research.

When disregarding the variables DIN2 (0.541) and DIN6 (0.643), with lower coefficients it was noticed that in the absence of them the optional model provides better results. The optional model provides the variables DIN1 (0,444, p-value= 0.000 <α = 0.05), DIN3 (0.572, p-value= 0.000 <α = 0.05), DIN4 (0.729, p-value= 0.000 <α = 0.05) and DIN5 (0.694, p-value= 0.000 <α = 0.05), statistically significant. The optional model provides reliable indicators CFI (0.992≥0.900), TLI (0.975≥0.900), as well as RMSEA (0.071≤0.100). The optional model will be used for this reason to explain the environmental dynamism in the research.

The organizational performance constructs provided satisfactory results, with CFI indicators (0.940≥0.900), TLI (0.900≥0.900) and RMSEA (0.073≤0.100) fixed, so it was decided not to carry out simulations to this construct.

To the analysis of general model were used the optional models to the construct's productive dynamic capability and environmental uncertainty and to the organizational performance construct the model initially proposed.

The rates found in the general model initially proposed to comply with the expected values. As CFI (0.927≥0.900), TLI (0.912≥0.900) and RMSEA (0.084≤0.10), the overall model was considered reliable and fixed to the research. Figure 1 presents the general model, with loads of each variable, used in this research.

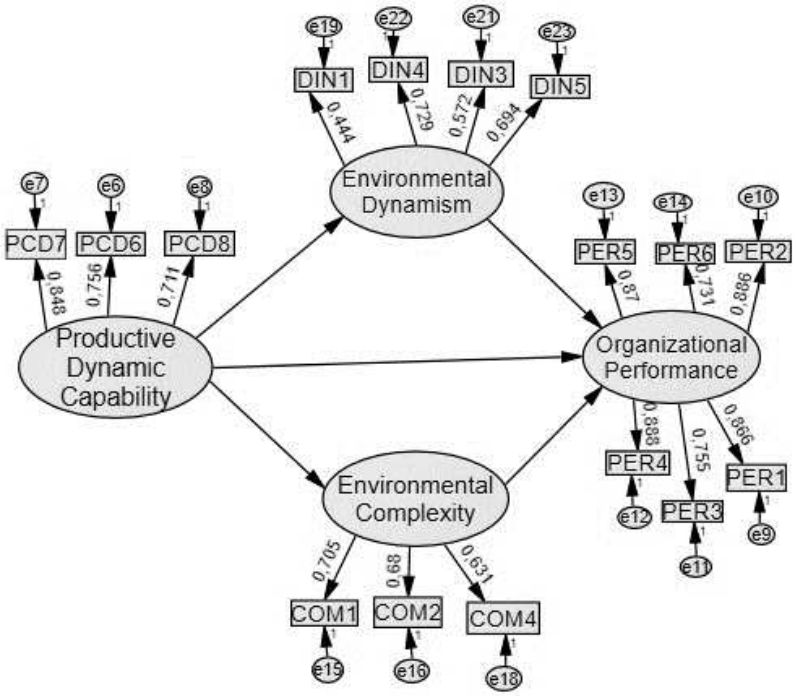

Figure 1 - General research model

The general model is considered fit to the research, being used to the hypotheses and correlation of the construct's tests.

4.1 Analysis of hypothesis tests

From the hypothesis test, we begin the discussion of the result, since the empirical evidence also requires theoretical validation to the measured model (Hair et al., 2009) Table 1 has the purpose of presenting the results of hypotheses, with their coefficient, significance and association level.

Table 1
Hypothesis testing

Hypothesis	Coefficient	*p-value*	Association	Result
H_1:	0.375	0.000	Positive	Confirmed
H_{2a}	0.000	1.000	Mediation	Confirmed
H_{2b}	0.000	1.000	Mediation	Confirmed

From the analysis, it was possible to confirm H_1, in other words, there is a positive and significant correlation (0.375) between the productive dynamic capability and the agroindustries surveyed performance (p-value= 0.000 <α = 0.05).

Barney (1991), points out in family businesses the involvement in management is a unique resource, thus, generating competitive advantage. Such a statement is relevant because 81% of the sample is made up of family agroindustries. In order to the competitive advantage to occur, it is necessary for an organization to develop new capabilities and use existing capacities while maintaining a synergy between the two (Teece et al., 1997).

In Desarbo, Benedetto, Song, and Sinha (2005) perspectives of one way of guaranteeing organizational performance in uncertain environments are to use all the dimensions of strategy capability. Among them, according to the author, the technological capability related to the efficient production process, cost reduction, development of new products, the management

capability related to the logistics systems and quality control. These dimensions and variables correspond to the productive dynamic capability variables.

This result support with other results from research carried with other types of specific dynamic capabilities and performance. The research carried out in Escobar's thesis (2012), for example, where the author identified positive results to the relation between dynamic absorption capability and dynamic innovation capability with performance. In other words, how bigger acquired knowledge and organizational innovation, how bigger the performance tends to be.

As found and reported by Escobar (2012), in this study, how bigger the organization's dynamic capability to acquire and reconfigure its resources and skills related to production such as product diversification, investment in distribution, quality in production, acquisition of automated and technological equipment, performance tends to go along that proportion. Since efficiency in the production process causes costs to be reduced for the organization, and finally increases its competitiveness (Day, 1994).

The outcomes point that agroindustries are capable of producing their products with their production capability, investing in diversity, quality, and technology to anticipate customer needs and innovate to maintain their differential.

According to the authors Rojo, Stevenson, Montes, and Perez-Arostegui (2018), they have identified that companies can achieve higher levels of flexibility in the supply chain through specific dynamic capabilities. As is the case in this study which has identified that companies can achieve superior performance through productive dynamic capability

On the other hand, the results of H_1 contradicts the results of the authors Mikalef and Pateli (2017) in their study of 274 companies, where dynamic capabilities have an indirect effect on the organization's performance. According to the authors, they contribute by reconfiguring the companies' market and operational capabilities and, therefore, the impact on its performance.

Regarding environmental uncertainty, both dimensions were considered as mediators of the supposed relation. Where H_{2a} is confirmed, the environmental complexity mediates the relation between productive dynamic capability and performance (0.000), mediation is considered significant (p-value= 1,000> $\alpha = 0.05$).

When the environments are considered of low uncertainty the information perceived by managers will be less likely to be noticed by competitors, thus the company guarantees a certain exclusivity for decision making (Boyd & Fulk, 1996). The authors Aragón-Correa and Sharma (2003), points out that the manager's perception about the environmental uncertainty levels can motive the organization to develop dynamic capabilities based on the strategies taken in relation to the obtained perception.

Organizational performance can be influenced by the manager's perception of environmental complexity, as they may retreat as to investments and changes due to the number of information they find (Aragón-Correa & Sharma, 2003). In small companies, this capability must be highlighted so that the ventures remain active and upward (Silveira-Martins & Rossetto, 2018).

Thus, Silveira-Martins and Tavares (2014) point out that the manager's perception of the environment has a relation between mercantile dynamic capability and performance. This influence is verified in this study, where complexity and dynamism measure the relation between productive dynamic capability and performance.

Where H_{2b} is confirmed, the environmental dynamism mediates the relation between productive dynamic capability and performance (0.000), where it was found significant in the mediation (p-value= 1,000> $\alpha = 0.05$).

Once the manager realizes the uncertainty of the environment, they use the reconfiguration capability to take advantage of the new opportunities that arise with the uncertainty. This appointment meets what Teece (2007) has stated, that dynamic capabilities

are related to the organization's competence to identify and shape opportunities and threats, to maintain competitiveness.

Barrales-Molina, Bustinza, and Gutiérrez-Gutiérrez (2012), in their research with 200 CEOs of Spanish companies, found that only the organizations that managers perceived the organizational environment as dynamic, developed the dynamic capabilities.

The theorists Silveira-Martins and Tavares (2014), and Silveira-Martins and Rossetto (2018), points that organizations are inserted in uncertain environments, which may affect in some way their performance, justifying the manager's need to interpret the environment with the greatest possible success, in order to understand the experiences that the organization spent during its trajectory.

The result of H_{2b} corroborates with Schilke (2014) that dynamic capabilities have a lesser relation to competitive advantage in environments with poor dynamism. In other words, when the dynamism is perceived by managers as poor or moderate, dynamic capabilities will not contribute to the performance of companies as expected, as they may deprive of reconfiguring and creating new resources, being at a disadvantage related to competitors.

The environment unpredictability ultimately affects the foreseeability of production in relation to future demands of expected production patterns (Kovach et al. 2015). However, managers are open to the doubts cause by the environmental uncertainty, regarding market requests, failure risk in the production process. According to Wang (2016), when family businesses are inserted in turbulent environments there will be a need for them to develop the capability to interpret the environment to follow the changes. Dynamic environments increase the need to change companies, mobilizing them to use their dynamic resources and affecting the need for change (Barbero et al., 2017).

The Wang (2016) studies with family companies found a positive relation between environmental dynamism, innovation, and adaptive dynamic capabilities meets with the authors results Rojo et al. (2018), in a study carried out with 302 Spanish manufacturing companies using structural equation modeling. The authors Rojo et al. (2018) confirm that the greater the environment dynamism, how greater the development of dynamic capabilities, such as the absorptive capability, and consequently the greater flexibility of supply chain.

The environmental turbulence can impact in the enterprise, requiring organizations to be flexible to the changes that occur in its environment (Qureshi et al., 2017). How small businesses deal with the environmental impacts will depend on their adaptability and their dynamic capabilities, so companies perceive the environment in different ways (Battisti & Deakins, 2017). Thus, depending on the manager's perception of the dynamism and complexity of the environment level, the rural agroindustrial project may decline or even be effectively opened.

5. FINAL REMARKS

The foregoing study has attempted to verify the correlation between the productive dynamic capability and the performance in southern Brazil agroindustries, and also if the environmental uncertainty mediates such relation. Based on such suggestions as D'Avila and Silveira-Martins (2017), to investigate productive dynamic capability with other constructs seeking to theoretically advance. According to the needs to be set forth by Fischer et al. (2010), Lavandoski, Silva, Vargas-Sánches and Pinto (2017). Helping in growth by quantitative empirical research on dynamic capabilities.

In addition to investigating the mediation of environmental uncertainty in this type of relationship following the suggestion of Gardelin, Rossetto, and Verdinelli (2013). In order to meet the research aim, measurement models were analyzed for each of the constructs to later perform the modeling of structural equations correlating the variables simultaneously.

Optional measurement models were created to verify the best data fit, such models were considered feasible to hold and continue the research for the construct's productive dynamic capability, environmental dynamism, and environmental complexity. Only the organizational performance construct presented the initial model with better statistical adjustments for the research sequence. It is noteworthy that the dimensions of environmental uncertainty, complexity and dynamism were measured separately for a better view on the effects of each dimension.

I could identify that the productive dynamic capability is associated with agroindustries performance. Thus, the largest manager's investment in productive dynamic capability — automated equipment, technology, skilled labor, production process control, production process quality, investment in distribution, product diversification — will promote a positive organizational performance.

During the research, I found another result that reveals that the uncertainty generated by the environmental variables affects the relation between the productive dynamic capability and the organizational agroindustries performance. Managers need to be aware of the changes that occur in the environment in which their organizations are inserted.

The managers must realize in an anticipated way the threats and opportunities, as well as efficiently interpret information passed through this environment. The agroindustries performance is subordinated to the productive dynamic capability level and is still dependent on the manager's perception of the levels of environmental uncertainty available in the environment.

Agroindustries must be considered to be in highly turbulent and complex environments, due to factors such as the climate which directly affects its production, as well as economic factors, access to credit, financing, restriction of distribution of products due to legislation that prevents of transporting their product to other states if they do not meet all the necessary requirements.

With the results found it can be pointed out that one of the ways that micro-sized and small-sized agroindustries have to overcome the complexity and the environmental dynamism is to develop and reconfigure its productive dynamic capability promoting the competitive advantage in the sector.

With the data research, it is possible to conclude on those variables that were excluded and also on those that followed after the confirmatory factorial analysis. In the variables case of productive dynamic capability excluded PCD1 (automated equipment), PCD2 (technological equipment), PCD3 (skilled labor), PCD4 (product diversity) and PCD5 (distribution). It can be assumed that the questions are run counter to the simple reality, and for this reason, when disregarded in the optional model it provided better fits in model view that was included.

A probable explanation is that 81% of the sample is made up by rural family agroindustries, and which have some distinctions from the other unfamiliar agroindustries, which may help to explain the final research model analyzed.

This fact explains why PCD1 and PCD2 are excluded, as family agroindustries have certain difficulties for the acquisition of automated and technological equipment. A factor that may have contributed to this result is the uncertainty of the decision maker regarding investing in this type of equipment, which can sometimes have a high cost that impacts the company's cash.

Regard to the exclusion of PCD3, the reason is supported by the fact that rural family farms only have family collaborators and do not hire external labor. The exclusion of PCD4 can be explained by considering that family rural agroindustries need to be regulated and comply with norms and laws for the marketing of its products in other states and county, which can sometimes affect the distribution by the entrepreneurs. This issue is also related to the agribusiness market competition with other food industries.

Regarding the variables that followed in the optional model, PCD6 (optimized production), PCD7 (control in the productive process), PCD8 (does not lose quality), it can be verified that the analyzed agroindustries seek strategies to maintain quality in the productive process and final product. The production process control helps companies to reduce production costs and avoid wastage. The agroindustries investment can be noticed in the products quality, in order to maintain its differential and guarantee a competitive advantage. By controlling their efforts, developing strategies and developing their productive dynamic capability to achieve its aims.

As to the environmental uncertainty variables with the exclusion of Com3 (information dispersion) and Din2 (competitors), it can be noticed that these agroindustries do not realize the competitors' existence in its segments. A possible explanation would be the fact that the rural family farms comply with a small part of the market, where there is no market competition, to the point of being noticed as a threat. Another explanation may be the fact that agroindustries have differentiated products, considered unique and with added value such as the territorial identity and cultural aspects present in the product, distinguishing them from the others.

With the questions about environmental uncertainty, considered in the final model, it is possible to perceive the difficulty in obtaining information for the decision-making of these agroindustries. Respondents identified difficulty in predicting market evolution (Com1), changes in the segment (Com4), customer needs (Din1), presenting the complex and dynamic environment that agroindustries are inserted.

The partners and suppliers change (Din3) can be explained by the poor production scale and due to this the difficulty highlighted by Fernandes (2004), in acquiring packaging in a small quantity. As in packaging, such difficulty includes other products used in production.

Another environmental uncertainty variable noticed by the respondents involves the change in the sector regulation (Din4), as explained by Fernandes (2014), agroindustries need to constantly adapt the laws that regulate them, causing uncertainty at the moment of decision-making. The researched process food agroindustries, which involves several regulations on good practices in manufacturing, processing, in addition to sanitary and environmental licensing, which may undergo constant changes.

By these thoughts, it becomes possible to understand the context of the agroindustries surveyed in addition to the statistical analyzes singly. This occurs when identifying possible reasons for the exclusion or maintenance of construct variables, which for certain reasons may distance from the reality of the object being searched. Finally, it can be concluded that the productive dynamic capability is correlated to the micro-sized and small-sized agroindustries of southern Brazil performance, and the environmental uncertainty mediates this relation.

This research contributes to the expansion and improvement of the studies regarding productive dynamic capability, organizational performance and environmental uncertainty. Providing new results and advancing in the literature through the findings and discussion.

As well as contributing to the management of rural agroindustries, it points that investment in productive dynamic capability, production line capabilities, including distribution, product diversification, and quality favors superior performance, but environmental uncertainties must be kept in mind that they will favor and not undermine this relation,

With the results, knowledge found it is possible for managers to initiate, or improve, the environment perception process in which the organization is inserted. It is suggested that the presence of a strategic process of environmental analysis will help in the advance and creation of new dynamic capabilities in order to improve the performance. Through this study the agroindustries managers' have empirical evidence of how the productive dynamic capability positively provide the organization performance, becoming fundamental for its companies.

5.1 Study limitations and recommendation to future research

One of these limitations pointed out in the study concerns the sample because if only a limited region is analyzed and the results found in this study cannot be generalized. Although such results are corroborated by the existing literature and confirmed through the statistical analyses performed, these should be considered only for the sample analyzed.

Although this study has responded to the proposed aim, suggestions for future research can be manifested. It is proposed to expand the study to other regions into Brazil and even from abroad with the possibility of comparisons between countries.

The theory about the productive dynamic capability has discoveries to be made yet, as for example, to verify the direct relation with environmental factors. And still, analyze the moderation of environmental factors in relation to productive dynamic capability and performance. Also, addressing environmental munificence in these relations of association, mediation and moderation.

Related to the research instrument on productive dynamic capability, analyze the possibility of exchange or changing the variable PCD3 (skilled labor), including the completion of training/courses, to be included in different contexts, as in the case of family agroindustries, validating the questionnaire.

New researches seeking to observe the agroindustry size, whether familiar or unfamiliar, the produced product type. Whether cooperated or not, whether owned by mono culture or poly culture, to verify the possibilities of these factors influence the theoretical relations proposed.

Other researches can be developed with the studied object, considering its importance to regional development. Research involving specific dynamic capabilities such as absorption will help to establish how the ideas and information dissemination occurs within micro and small-scale agroindustries. The mercantile dynamic capabilities to understand how this sector deals with specific competency of the adequacy of customers and the market needs.

Thereof, verifying the mediation of the entrepreneurial orientation in the relation between productive dynamic capability and performance can help to understand if the dimensions of the orientation influence this relation. As well as analyzing how the alliances' formation in the agroindustries sectors provide in the dynamic capabilities and the performance of the same ones.

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