ARTICLES

Relationship between environment, structure and efficiency in contingency theory: a systematic review of literature

Danny de Castro Soares¹
Alexandre Maduro-Abreu²

ABSTRACT

Contingency theory states that the structure of organizations must be flexible to external contingencies, especially to the dynamic environment. To verify if the current research still analyzes this assumption, the article develops a systematic review of literature on the relationship between structure, environment and efficiency within the context of contingency theory. We used the protocol predicted by Cronin, Ryan and Coughlan (2008) with the bibliometry methodology of Cobo et al. (2011) using the software VosViewer. The results pointed out that a great part of the research that relates the environment and the structure is concentrated in the logistics area. He also pointed out that in recent studies dealing with contingency theory a more efficient structure is reactive to the external environment.

KEYWORDS: Contingency theory. Environmental. Performance.

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¹ Doutorando em Economia. Programa de Pós-Graduação em Economia. Universidade Católica de Brasília. Pesquisador no CPGIS/FACE/UnB, Brasília, (Brasil). Email - danny.castrosoares@gmail.com
² Doutor em Desenvolvimento Sustentável. Diretor do Centro de Pesquisa em Gestão, Inovação e Sustentabilidade - CPGIS/FACE/UnB, Brasília, (Brasil). Email – maduro@unb.br
Relação entre ambiente, estrutura e eficiência na teoria da contingência: uma revisão sistemática de literatura

RESUMO

A teoria da contingência afirma que a estrutura das organizações deve ser flexível a contingências externas, especialmente ao ambiente dinâmico. Para verificar se a pesquisa atual ainda utiliza esse pressuposto, o artigo desenvolve uma revisão sistemática da literatura sobre a relação entre estrutura, ambiente e eficiência dentro do contexto da teoria da contingência. Utilizamos o protocolo previsto por Cronin, Ryan e Coughlan (2008) com a metodologia bibliométrica de Cobo et al. (2011) usando o software VosViewer. Os resultados apontaram que grande parte das pesquisas que relacionam o meio ambiente e a estrutura estão concentradas na área de logística. Ele também apontou que, em estudos recentes sobre a teoria da contingência, uma estrutura mais eficiente é reativa ao ambiente externo.

PALAVRAS-CHAVE: Teoria da contingência. Ambiente. Performance.
INTRODUCTION

The relationship between structure and environment is directly related to performance. In recent years, organizations are located in increasingly dynamic environments and their adaptation to the environment has been the focus on studies of companies (HREBINIACK; JOYCE, 1985; GINSBERG; BUCHHOLTZ, 1990).

For more than 50 years, contingency theory (or contingency approach) has influenced the idea of organizational adjustment. This theory holds that efficient management is adaptative, depends on the characteristics of each circumstance of the company and how it must adapt to the environment and external contingencies.

However, it is questioned whether recent studies still observe this reactive position of the institutions towards the external environment. To do this, we used the literature review as an appropriate analysis model for the proposal and the questions that were presented throughout the construction of this article, considering the relevance of such studies for the sizing of production on a given theme (GUARNIERI, et al., 2015). The systematic review of the literature is not only a review of previous articles but a more rigorous and well defined review process, which follows replicable protocols, to identify, evaluate and synthesize the literature (THOMÉ; SCAVARDA; SCAVARDA, 2016).

In the area of administration, it is important to map research to understand the dynamics of studies in this area. This becomes more relevant when in an area as fragmented as administration (THOMÉ; SCAVARDA; SCAVARDA, 2016).

This research proposes to make a systematic review of the literature and bibliometrics of the relation between the environment, efficiency and structure of the organizations, according to the contingency theory. Thus, we will use the protocol of Cronin, Ryan and Coughlan (2008) for the systematic review combined with bibliometric technique from Cobo et al. (2011).

1 LITERATURE REVIEW

The earliest research on contingency theory came from Woodward (1958, 1965), Lawrence and Lorsch (1967), and Thompson (1976). They have begun to develop a concept that there is no better way to manage or organize an institution. In this sense, this theory is based on the premise that there is no model that adapts to all companies in all circumstances, because the changes occur in the systems due to the impact of certain types of occurrences (BURNS; STALKER, 1994).
Several articles have been published since the emergence of contingency theory in the 1950s and 1960s, ranging from empirical studies (BURNS; STALKER, 1994; DONALDSON, 2001; LAWRENCE; LORSCH, 1967) to the adjustment of organizational structures (DUNCAN, 1972; MILES; SNOW, 1978).

The contingency theory starts from a central point that the efficiency of the organization depends on the relation of the factors of contingency with its internal structure (BURNS; STALKER, 1994). Hanisch and Wald (2012) compile the evolution of this theory with the main contingencies and organizational configurations according to the contingency theory.

An external environment (uncertain most of the time) is one of the main contingencies in which the organization should react (THOMPSON, 1976). We can understand the external environment of the organization as the set of factors that influence (or can influence) the operation of the organizational system (LAWRENCE; LORSCH, 1967).

In a broad form it includes, for example, technological, political, economic, legal, demographic, cultural conditions, among others. However, it also understands the environment closest to the organizational activity made up of suppliers, customers and regulators (MINTZBERG, 1979; LAWRENCE; LORSCH, 1967).

However, predicting the relationship between the organizational structure and the environment is quite difficult. The variances of strategy and company structure are the result of demands and tend to be specific to each. This lack of generalization makes it impossible, in the precepts of contingency theory, that organizations use the same strategy to solve environmental demands, and therefore they tend to be company-specific to meet the mix of emerging environmental fluctuations (DUNCAN, 1972; MILES; SNOW, 1978; VENKATRAMAN, 1989).

In this aspect, the concept of organizational structure adaptive to the external environment arises. Organizational models that are more organic and flexible to environmental contingencies show better results in performance and efficiency levels (LAWRENCE; LORSCH, 1967).

2 METHODOLOGY

The article was developed through a systematic review of the literature on the relationship between structure, environment and efficiency within the context of contingency theory. The choice of this revision model is due primarily to the fact that, unlike the
traditional literature review, the objective of a systematic review is to provide as complete a list as possible of all published studies related to a particular subject using explicit and rigorous criteria (CRONIN; RYAN; COUGHLAN, 2008). The systematic review of the literature is not only a review of previous articles but a more rigorous and well defined review process, which follows replicable protocols, to identify, evaluate and synthesize the literature (THOMÉ; SCAVARDA; SCAVARDA, 2016).

Thus, this study used the systematic review procedure proposed by Cronin, Ryan and Coughlan (2008), used by Guarnieri et al. (2015) and Thomé, Scavarda and Scavarda (2016). In addition, it was decided to perform a quantitative bibliometry according to Cobo et al. (2011) performing a co-citation analysis of documents and analysis of co-occurrence of words.

The criteria presented by Cronin, Ryan, & Coughlan (2008) were used in this paper as follows:

(a) Formulation of the research question: what is the relationship between environment, structure and efficiency, according to Contingency Theory?

(b) Establishment of inclusion and exclusion criteria: the criteria used to filter the selected texts involve bases to be selected, period, types of articles, keywords and Boolean operators (GUARNIERI et al., 2015). The database used was Scopus, because it was multidisciplinary and added the search of several journals. The keywords, with their boolean operators, were "Contingency theory" AND "efficiency" OR "performance". They were searched in abstract, title and keywords. The selected period was from 2008 until 2017. Afterwards, he selected only the area of "Business, Management and Accounting".

(c) Literature selection and access: overall search results returned 254 results. According to the inclusion and exclusion criteria mentioned in the previous topic, 34 papers were excluded from the population, since they are publications related to congresses and events, research reports, theses or dissertations. In this phase, with 220 articles on the subject, bibliometry was performed according to Cobo et al. (2011).

(d) Evaluation of the quality of the literature included in the review: as a quality criterion, we chose to select only those published in journals with impact factors in Journal Citation Reports (JCR). This impact factor is used in other qualification methods of a literature review such as Pagani, Kovaleski and Resende (2015). Thus, there were 146 scientific articles that met the criteria. The abstract was read to select articles that addressed the relationship between structure, environment and efficiency according to contingency theory. After this selection, 25 surveys were analyzed.
(e) Analysis, synthesis and dissemination of results: finally, the articles were read and analyzed in detail.

3 RESULTS

Descriptive Statistics

In this step, the descriptive analyzes of the 220 articles selected according to the criteria previously described are carried out. It is observed that almost 25% of the researches are concentrated in American institutions. The UK also plays a relevant role in the Contingency Theory research.

Graph 1 – Authors’ countries

Font: elaborated by the authors from the research data.

The journals that had the most publications are from the logistics area - Journal of Operations Management; International Journal of Operations and Production Management; International Journal of Production Research.
Aiming to observe the main authors mentioned, and to identify the seminal researches of contingency theory and the relation between efficiency and environment, a logarithmic modulation was performed in the VosViewer software of the authors cited in the refineries that had more than 20 citations. We can see, as expected, the centrality of authors of the contingency theory who had more quotations: Venkatraman, N (118); Donaldson, L. (84); and Miller, D (125).

Table 1 - Sources

| Source                                                      | qnt |
|-------------------------------------------------------------|-----|
| Journal of Operations Management                            | 10  |
| International Journal of Operations and Production Management| 10  |
| International Journal of Production Research                | 7   |
| International Journal of Production Economics               | 6   |
| Industrial Management and Data Systems                      | 6   |
| International Journal of Logistics Management               | 5   |
| Decision Sciences                                           | 5   |
| Strategic Management Journal                                | 4   |
| Management Decision                                        | 4   |
| Journal of International Marketing                          | 4   |
| Journal of Cleaner Production                               | 4   |
| Industrial Marketing Management                             | 4   |
| Organization Science                                        | 3   |
| Journal of Management and Governance                        | 3   |
| International Journal of Productivity and Performance Management| 3   |
| International Journal of Physical Distribution and Logistics Management | 3   |
| Global Business and Organizational Excellence               | 3   |

**Font:** elaborated by the authors from the research data.
Considering the purpose of the research to analyze the relationship between environment, structure and efficiency, according to the contingency theory, the analysis of the key words as proposed by Cobo et al. (2011). The data were worked on the SciMAT v1.1.04 software using the aggregation of similar words in the plural and by means of the maximum distance of Levenshtein, with parameter 3 and working individually the similar words.

Graph 3 presents data modeled in the VosViewer software with keywords that had more than 5 occurrences, where the relationship between environment, performance and contingency theory is observed in the central cluster. In peripherals, two major areas of study are inferred: logistics and innovation.
We chose to remove the term "Contingency Theory" from the analysis to see the relation of the other keywords and to test if even then the centrality of the performance and the environment takes place. In Graph 4 this analysis is performed. It is observed that the environment and performance remain central, as expected. However, logistics / supply chain also plays a central role while the cluster that deals with innovation remains peripheral.
When analyzing the network formed by the keywords of the surveys, it is observed that the performance appears with 101 occurrences. However, this fact was already expected due to the words inserted to select the articles. Right after the environment comes up with a relevant number of keywords that address the environment. As proposed by Thompson
an external environment, uncertain most of the time, appears as the main contingency in which the organization must react to improve its performance. This is observed in the network where the connection between environment and performance is central and close.

In the network, we also highlight studies that investigate logistics and the supply chain. In a recent systematic review of literature, conducted by Tachizawa and Wong et al. (2015), it was observed how contingency theory is widely applied in supply chain management.

4 DISCUSSION

In order to understand the relationship between the organization's environment, structure and efficiency, it was decided to segment the articles according to the main theme that was analyzed. Thus, the following areas of analysis were separated: marketing; innovation; Human Resources; logistics and others. Before, a consolidated analysis of the relationship between environment, structure and efficiency is carried out.

4.1 RELATIONSHIP BETWEEN ENVIRONMENT X STRUCTURE X EFFICIENCY

The central objective of the analysis was to observe how the organizational structure relates to the environment and how this relationship affects its efficiency. After the individual analysis of each article, it is possible to infer an overview of how the previous relationship occurs in the featured articles.

The first dimension analyzed refers to the organizational structure. In this aspect, the difficulty of identifying its concept in the analyzed studies stands out. This is due to the multidisciplinary nature of the research. Nevertheless, it was sought to identify if the organizational structure, facing environmental contingencies, should be standardized or flexible / adaptive and proactive or reactive to the external environment. According to the assumptions of the Contingency Theory (Woodward, 1958, 1965; Lawrence; Lorsch, 1967; Thompson, 1976), an adaptive and reactive structure presented better results. This conclusion was found in most articles analyzed. Exception occurred in Simangunsong, Hendry and Stevenson (2016) research - where the best results occurred with a proactive / environment-modifying action and Souchon et al. (2016) - who noted that marketing strategy decisions should not be so flexible.

The second aspect analyzed refers to the definition of efficiency. According to Megginson et al. (1998), efficiency presents itself as a fundamental concept in management,
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where it is related to minimizing costs by maximizing results. In the analyzed articles, it was observed that the relationship between environment and structure impacts a greater dimension of organizational performance that involves efficiency in a strict sense and a broader dimension that encompasses quality and customer satisfaction. The following table consolidates these results:

| Research area | Performance definition | Authors | Dimension / Efficiency |
|---------------|------------------------|---------|------------------------|
| Marketing     | Profitability          | Chung, Wang and Huang (2012); Zeriti et al. (2014) | Limited |
|               | Sales                  | Chung, Wang and Huang (2012); Zeriti et al. (2014); Souchon et al. (2016) | Limited |
|               | “Marketing Capability” | Yu, Ramanathan and Nath (2017) | Wide |
| Innovation    | Profitability          | Verworn (2009); Tsai and Hsu (2014); Tsai and Yang (2013); Lau (2014); Kach et al. (2016); Das and Joshi (2012); Gupta and Batra (2016) | Limited |
|               | Sales                  | Verworn (2009); Tsai and Hsu (2014); Tsai and Yang (2013); Lau (2014); Kach et al. (2016); Das and Joshi (2012); Gupta and Batra (2016) | Limited |
|               | Satisfaction           | Lau (2014); Gupta and Batra (2016) | Wide |
| Human Resources| Profitability          | Cooper, Patel and Thatcher (2014); Hmieleski, Carr and Baron (2015) | Limited |
| Logistics     | Timeless               | Yu, Cadeaux and Song (2012); Hwang and Min (2013); Terjesen, Patel and Sanders (2012); Zhang, Linderman and Schroeder (2012); | Limited |
|               | Profitability          | Yu, Cadeaux and Song (2012); Hwang and Min (2013); Terjesen, Patel and Sanders (2012); Simangunsong, Hendry and Stevenson (2016); Patel (2011); Zhang, Linderman and Schroeder (2012); Hultman, Robson and Katsikeas (2009); Ng et al. (2015) | Limited |
|               | Quality                | Hwang and Min (2013); Terjesen, Patel and Sanders (2012); Zhang, Linderman and Schroeder (2012); Hultman, Robson and Katsikeas (2009); Ng et al. (2015) | Wide |
|               | Satisfaction           | Ng et al. (2015); Hultman, Robson and Katsikeas (2009) | Wide |
| Others        | Sales                  | Wang and Bao (2017); Pekovic and Rolland (2016) | Limited |
|               | Timeless               | Hammad, Jusoh and Oon (2010) | Limited |

Font: elaborated by the authors from the research data.

The environment was the third element analyzed and presented according to the assumptions of Thompson (1976) being an external contingency in which the organization should react. The factor of the unpredictability of the environment was emphasized in the studies of Souchon et al. (2016), Wang and Bao (2017), Hwang and Min (2013); Lau (2014);
Hammad, Jusoh and Oon (2010); Cooper, Patel and Thatcher (2014) and Hmieleski, Carr and Baron (2015). Others have not quoted whether the environment can be predictable. However, it was possible to infer that managerial decisions and practices need to be adapted to the environmental demands to obtain desired work behaviors and improve performance.

### Table 4 - Environment

| Research area        | Environment                                      | Authors                                                                                           |
|----------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Marketing            | Regulations / Legal Environment                  | Chung, Wang and Huang (2012); Zeriti et al. (2014); Yu, Ramanathan and Nath (2017)                |
|                      | Cultural conditions / Characteristics of consumers | Chung, Wang and Huang (2012); Zeriti et al. (2014); Souchon et al. (2016)                         |
|                      | Technological uncertainties                      | Zeriti et al. (2014)                                                                              |
|                      | Pressures of Stakeholderses                      | Yu, Ramanathan and Nath (2017)                                                                   |
|                      | Market dynamism                                  | Souchon et al. (2016)                                                                            |
| Innovation           | Competitive intensity                            | Tsai and Hsu (2014); Tsai and Yang (2013); Kach et al. (2016); Gupta and Batra (2016)            |
|                      | Market uncertainties                             | Verworn (2009); Das and Joshi (2012); Lau (2014); Gupta and Batra (2016)                         |
|                      | Technological uncertainties                      | Verworn (2009); Lau (2014)                                                                       |
| Human Resources      | Environmental dynamism                           | Cooper, Patel and Thatcher (2014); Hmieleski, Carr and Baron (2015)                              |
| Logistics            | Market uncertainties                             | Yu, Cadeaux and Song (2012); Hwang and Min (2013); Terjesen, Patel and Sanders (2012); Patel (2011); Zhang, Linderman and Schroeder (2012); Hultman, Robson and Katsikeas (2009); Ng et al. (2015) |
|                      | Technological uncertainties                      | Yu, Cadeaux and Song (2012); Hwang and Min (2013); Patel (2011); Hultman, Robson and Katsikeas (2009); |
|                      | Regulations / Legal Environment                  | Simangunsong, Hendry and Stevenson (2016); Ng et al. (2015)                                       |
|                      | Cultural conditions / Characteristics of consumers | Zhang, Linderman and Schroeder (2012); Hultman, Robson and Katsikeas (2009); Ng et al. (2015)   |
| Others               | Market uncertainties                             | Wang and Bao (2017); Pekovic and Rolland (2016)                                                  |
|                      | Environmental dynamism                           | Wang and Bao (2017); Pekovic and Rolland (2016); Hammad, Jusoh and Oon (2010)                   |
|                      | Technological uncertainties                      | Hammad, Jusoh and Oon (2010)                                                                     |
|                      | Regulations / Legal Environment                  | Hammad, Jusoh and Oon (2010)                                                                     |

Font: elaborated by the authors from the research data.

4.2 REVIEWED ARTICLES
MARKETING

The four articles that study marketing concluded that the ideal structure should be adaptive to the environment, considering the external contingency factors. It should be emphasized only in Souchon et al. (2016). That this adaptive vision occurs only effectively in day-to-day marketing decisions, not taking place in strategic decisions. Most of the performance in the marketing area was measured with the effect on sales, profit or market size of the organization.

Chung, Wang and Huang (2012) analyzed the relationship of the environment and the marketing strategy in the decision structure of the organization. Mainly in the legal environment of countries, the research supports a contingent view in which external factors shape the marketing structure, where a strategy of adaptation is more efficient than standardization.

Similarly, Zeriti (2014) analyzed how the adaptive marketing strategy, against external environmental factors, affects the export performance of organizations. The authors conclude that the adaptive adaptation of the strategy to environmental factors improves the performance of exports.

Yu, Ramanathan and Nath (2017) analyzes how environmental pressures modify the performance of organizations, analyzing the moderating role of marketing in absorbing these contingencies. Thus, the author verifies that environmental factors shape the structure of the organization, however, marketing of the institution moderates this relationship where performance becomes greater when the organization has a high "marketing capability" - an integrative process in which a company uses its knowledge market, customer and supplier detection skills, and building relationships with all of its stakeholders.

In turn, Souchon et al. (2016) explores the benefits of spontaneity in international marketing decisions. Designed from the theory of contingency, the author points out the need to analyze and consider external environmental factors in the design of the marketing strategy. The author points out that "day-to-day" marketing decisions are more effective if carried out spontaneously. However, more strategic and complex decisions are not as productive if they are so flexible.
INNOVATION

Research on innovation - new product development and entrepreneurship - has highlighted better results in adaptive structures that react to external environmental factors (mainly related to the competitive intensity).

In light of the contingency theory, Verworn (2009) analyzed the fuzzy front end. He noted that environmental uncertainties, such as the degree of novelty of a new product on the market and technological uncertainties, suggest different management approaches, and the new product development team should adapt to external factors.

Tsai and Hsu (2014) concludes in a similar way to the previous study and found that managers should detect the market environment (external contingencies) and adapt their structure in the development of new products. However, he stressed that this relationship is not tight. It should be a process throughout the process of product design.

Kach et al. (2016) examined how four distinct forms of hostile environments (market decline, tightness, competition, and scarcity of resources) affect performance in product innovation and organizational performance. The authors conclude from the importance that future studies use this segmentation in the environment and highlight the market decline as a factor that is more related to the performance of the organization and should the organization adapt to better performance.

On the other hand, Lau (2014) analyzes how contingent factors influence the integration of suppliers and, with this, the development of a new product. Environmental uncertainty was defined as the degree of marketing and technology uncertainty in the development of a new product. The performance of the product was defined through consumer satisfaction; sales goals and product profitability. Among the contingent factors, the author points out that environmental uncertainty affects the integration of suppliers and, with this, the development of new products.

Unlike previous studies that addressed innovation in new product development, Tsai and Yang (2013) notes the effect of organizational innovation, in a broader sense, on business performance. It is based on contingency theory to develop a conceptual framework that investigates how the interaction between market turmoil and competitive intensity moderates the relationship between innovation and business performance. Their results show that the effect of innovation on business performance varies according to the different configurations of market turmoil and competitive intensity. Specifically, the performance effect of enterprise innovation is more positive under high market turmoil and high competitive intensity. In this
sense, as predicted in contingency theory, the organization must shape its structure of innovation for better performance against external environmental factors.

Das and Joshi (2012) presents as the external environment by influencing the innovation process in technology service companies and how this affects the organizational result. The author assumes that the innovation process leads to greater efficiency in organizations. In this sense, the external environment, measured by environmental hostility, is a major moderator of innovation in organizations, and institutions must adopt strategies to align with these environmental factors.

Gupta and Batra (2016) analyzes the relationship between entrepreneurial orientation (degree to which company strategy reflects entrepreneurial practices and behaviors) and organizational performance. Performance is analyzed in the dimension of efficiency (profitability, productivity) and effectiveness (achievement of objectives, customer satisfaction). When analyzing companies in India, the author finds that environmental contingencies (demand growth and competitive intensity) moderate the relationship of performance and entrepreneurial orientation. In that case, the organization must adapt to these factors for the best results.

HUMAN RESOURCES

Two studies analyzed observed the relationship of the external environment with the human resources of the organization and how this affects their respective performance. Both pointed to a better organizational performance, adapting the structure of human resources to dynamism and environmental uncertainty.

Cooper, Patel and Thatcher (2014) analyzed how the external environment moderates the effects of informational failures (division of teams in companies) on the performance of the company in top management teams. The authors conclude that environmental dynamism (instability and unpredictability) and environmental complexity (measured by the concentration of competitors) influence the informational failures of top management and, therefore, organizational performance. The best organization, according to the author, would be to adapt the human resources team to these environmental factors.

Hmieleski, Carr and Baron (2015) investigates the relationships of the intangible resources of founding CEOs with the performance of their firms in industrial environments that are stable (slow and predictable changes) versus dynamics (rapid changes and unpredictable). Regarding the relation of the environment and contingency theory, the results
highlighted the importance of the adjustment between the organizational resources and the characteristics of the industries in which they try to develop and expand their companies.

LOGISTICS

The largest number of studies selected analyzed the relationship of environment and structure within the supply chain and logistics. Yu, Cadeaux and Song (2012) analyzes the flexibility - defined in terms of the ability to change or react to the environment - of distribution within the supply chain. It addresses the fact that a better performance, in terms of efficiency (time and cost reduction) and efficiency (product suitability), is due to the flexibility of distribution in the face of environmental contingencies.

Hwang and Min (2013) analyzes whether the external environment can interfere with the adoption and results of the Enterprise Resource Planning framework in supply chain management. ERP is a corporate tool capable of controlling all the information of a company, integrating and managing data, resources and processes, increasing its decision-making power and, consequently, the efficiency of the organization. Although the authors conclude that the external environment has little influence on ERP adoption, it significantly influences the results and the implementation of this management model, and organizations that adopt this management model adapt to external contingencies.

Terjesen, Patel and Sanders (2012) analyzes the performance in the integration of the supply chain with suppliers, buyers and customers. The author finds support for a contingency perspective because the adjustment is especially critical at higher levels of environmental uncertainty. In this case, the necessary structure is to integrate and adapt the supply chain to external environments.

Patel (2011) analyzes the duality between the flexibilization and standardization of the structures of manufacturing organizations of emerging firms in the face of an uncertain environment. Environmental uncertainty is analyzed in the set of three uncertainties: demand, competitive and technical.

The authors conclude that the standardization structure, in the face of environmental uncertainty, results in lower organizational performance. On the contrary, the flexible manufacturing structure leads to better performance.

Zhang, Linderman and Schroeder (2012) investigates how environmental uncertainty influences Quality Management and manufacturing performance. Environmental uncertainty is analyzed in three dimensions: consumer need (changing demand), product change and
competition. Regarding the organizational structure, the author analyzes which structure is more efficient in the face of environmental contingencies that affect quality management: a mechanist (more rigid) and a more organic (flexible) one. The author concludes that the effectiveness of quality management (which impacts on organizational performance) depends on the interaction between the structure and the environmental uncertainties. In this way, a more flexible and adaptive structure to the environment presented a greater performance in the administration of the quality in high environmental uncertainties.

Also analyzing quality management, Ng et al. (2015) verifies that to optimize organizational performance, manufacturing, in uncertain environments, Total Quality Management (TQM) must be implemented in whole or in part. The author conceptualizes environmental uncertainties such as volatility and lack of predictability in the external environment in which companies compete. The results show that the same TQM structure is not ideal in volatile and stable environments. In uncertain environments, applying TQM in manufacturing presents better results since it is adapted to the uncertainties encountered.

Hultman, Robson and Katsikeas (2009) analyzes that the strategy of adaptation to the different environmental conditions, in the export of products.

Based on the assumptions of the contingency theory, the authors point out that there is no single solution to the decision to adapt the export product strategy and that this will depend on each specific contingency. The adaptive strategy is related to a greater performance in the export of products, both quantitative and financial, both qualitative of reception of the products by the customers.

In contrast, Simangunsong, Hendry and Stevenson (2016) observed better results in a positive reaction - modifying the environment - than reactive - adapting to environmental contingencies. The author analyzes which strategies of efficient management in front of sources of uncertainty in the supply chain. Among the critical factors analyzed, the environmental uncertainty generated by the excesses of government regulations in the sector was analyzed. In this sense, the results of the case study point to an opposite result to that predicted in the contingency theory. The best performance occurred in the situation of proactivity of the organization in the change of environment. However, the change in the external environment would occur with factors, designated by the author, as anti-ethics, such as the Lobby with companies.
OTHERS

The other articles analyzed were not subdivided into previous categories because they dealt with quite specific subjects about their theme. In them, it was observed that the best performance would occur with the organizational structure adapting / reacting to external environmental factors.

Wang and Bao (2017) analyzes the strategy of operating high-performance alliance portfolios, verifying their effects on the performance of focal companies. Alliance portfolios are constantly analyzed from a resource-based perspective. However, in the light of contingency theory, the author analyzes the environment by the environmental dynamism that is the rate of change and the unpredictability of the change in the structure of an organization. Environmental uncertainty can play a moderating role in the effect of different sizes of alliance portfolios on performance. With the increase in environmental dynamics, companies can focus more resources on the management of current alliance portfolios, maintaining the relationship and strengthening trust. By maintaining existing size or reducing size to some extent, it benefits the performance of the focal companies. The environment modifies the structure of the portfolio alliances.

Pekovic and Rolland (2016) analyzes how external environmental factors influence the relationship of customer orientation and business performance. The author points out that external factors modify this relationship and that the best structure, given environmental contingencies, is a market-oriented orientation. In this case, the efficiency of the mediated effect on customer orientation can be improved if certain external conditions of the environment are installed.

Hammad, Jusoh and Oon (2010) analyzes the relationship between contextual factors, the accounting management system, and organizational outcomes in Egyptian hospitals. The external environment is composed, according to the author, by technological changes, economic structure, regulatory structure and environmental uncertainty. The latter, the most influential variable in "management information system design". The Accounting Administration System plays an intervening, mediation role, being shaped by external environmental factors and influencing organizational performance.

CONCLUSION

The debate about the relationship between the environment and the structure has been carried out in the current studies of performance and performance of organizations. In this
context, contingency theory states that the best organizational structure is reactive, that is, it adapts to the environment according to contingencies. This study carried out a systematic review of the literature to observe whether in recent studies this premise remains true.

Initially, the bibliometrics carried out pointed out that the environment is a key factor in the relationship between the organization and the environment, besides highlighting the relevance of studies that analyze logistics, supply chain and innovation.

When analyzing 25 selected articles with the previously defined parameters, it was initially observed that the performance of the organization is now strictly seen - only in the sense of efficiency - and now widely seen - encompassing concepts of efficiency, effectiveness and effectiveness. The environment, in the selected studies, is seen as the external environmental contingencies. In this sense, it varies in each study according to the data collected and analyzed empirically.

In turn, it was observed that the adaptive structure to the environment presented better performance in the articles analyzed. This factor is verified in the theory of contingency where organizations adapt to the environment according to external and internal factors to achieve their results. Only in one study such a premise was not observed.

Finally, this research contributes to the academic world by analyzing several studies that explore the relationship between environment, structure and efficiency within the context of contingency theory.

This research is limited to the method used. Therefore, some studies may have been excluded in the subjective analysis. Future research can be carried out to find the relationship between environment, efficiency and structure in other theories of resource, stakeholder and institutional dependence.

REFERENCES

ARI, G.; BUCHHOLTZ, A. Converting to For-Profit Status: Corporate Responsiveness to Radical Change. The Academy of Management Journal, v. 33, n. 3, p. 445–477, 1990.

BURNS, T.; STALKER, G. M. The Management of Innovation. Revised ed ed. [s.l.] Oxford University Press, 1994.

CHUNG, H. F. L.; WANG, C. L.; HUANG, P. -H. A contingency approach to international marketing strategy and decision-making structure among exporting firms. International Marketing Review, v. 29, n. 1, p. 54–87, 2012.
COBO, M. J.; HERRERA, F. Science Mapping Software Tools: Review, Analysis, and Cooperative Study Among Tools. Journal of the American Society for Information Science and Technology, v. 62, n. 7, p. 1382–1402, 2011.

COOPER, D.; PATEL, P. C.; THATCHER, S. M. B. It depends: Environmental context and the effects of faultlines on top management team performance. Organization Science, v. 25, n. 2, p. 633–652, 2014.

CRONIN, P.; RYAN, F.; COUGHLAN, M. Undertaking a literature review: a step-by-step approach. British Journal of Nursing, v. 17, n. 1, p. 38–43, 2008.

DAS, S. R.; JOSHI, M. P. Process innovativeness and firm performance in technology service firms: The effect of external and internal contingencies. IEEE Transactions on Engineering Management, v. 59, n. 3, p. 401–414, 2012.

DONALDSON, L. The contingency theory of organizations. [s.l.] Thousand Oaks, CA: Sage., 2001.

DUNCAN, R. B. Characteristics of organizational environments and perceived environmental uncertainty. Administrative Science Quarterly, v. 17, n. 3, p. 313–327, 1972.

GUARNIERI, P. et al. The challenge of selecting and evaluating third-party reverse logistics providers in a multicriteria perspective: a Brazilian case. Journal of Cleaner Production, v. 96, n. 1, p. 209–219, 2015.

GUPTA, V. K.; BATRA, S. Entrepreneurial orientation and firm performance in Indian SMEs: Universal and contingency perspectives. International Small Business Journal, v. 34, n. 5, p. 660–682, 2016.

HAMMAD, S. A.; JUSOH, R.; OON, E. Y. N. Management accounting system for hospitals: A research framework. Industrial Management and Data Systems, v. 110, n. 5, p. 762–784, 2010.

HANISCH, B.; WALD, A. A bibliometric view on the use of contingency theory in project management research. Project Management Journal, v. 43, n. 3, p. 4–23, 2012.

HMIELESKI, K. M.; CARR, J. C.; BARON, R. A. Integrating Discovery and Creation Perspectives of Entrepreneurial Action: The Relative Roles of Founding CEO Human Capital, Social Capital, and Psychological Capital in Contexts of Risk Versus Uncertainty. Strategic Entrepreneurship Journal, v. 9, n. 4, p. 289–312, 2015.

HREBINIAK, L. G.; JOYCE, W. F. Organizationaltion: Strategic Choice and Environmental Determinism. Administrative Science Quarterly, v. 30, n. 3, p. 336–349, 1985.

HULTMAN, M.; ROBSON, M. J.; KATSIKEAS, C. S. Export product strategy fit and performance: An empirical investigation. Journal of International Marketing, v. 17, n. 4, p. 1–23, 2009.
HWANG, W.; MIN, H. Assessing the impact of ERP on supplier performance. *Industrial Management & Data Systems*, v. 113, n. 7, p. 1025–1047, 2013.

KACH, A. *et al.* Maneuvering through Hostile Environments: How Firms Leverage Product and Process Innovativeness. *Decision Sciences*, v. 47, n. 5, p. 907–956, 2016.

LAU, A. K. W. Influence of contingent factors on the perceived level of supplier integration: A contingency perspective. *Journal of Engineering and Technology Management - JET-M*, v. 33, p. 210–242, 2014.

LAWRENCE, P. R.; LORSCH, J. W. *Organization and environment: Managing differentiation and integration.* Boston, MA: Harvard Business Press., 1967.

MEGGINSON, L. C. ;; MOSLEY, D. C. ;; PIETRI JUNIOR, P. H. *Administração – conceitos e aplicações.* 4. ed. São Paulo: Saraiva, 1998.

MILES, R. E.; SNOW, C. C. *Organizational strategy, structure and process.* [s.l.] New York: McGraw-Hill, 1978.

MINTZBERG, H. *The structuring of organizations.* Englewood Cliffs. [s.l.] NJ: Prentice-Hall., 1979.

NG, S. C. H. *et al.* TQM and environmental uncertainty levels: Profiles, fit, and firm performance. *International Journal of Production Research*, v. 53, n. 14, p. 4266–4286, 2015.

PAGANI, R. N.; KOVALESKI, J. L.; RESENDE, L. M. Methodi Ordinatio: a proposed methodology to select and rank relevant scientific papers encompassing the impact factor, number of citation, and year of publication. *Scientometrics*, v. 105, n. 3, p. 2109–2135, 2015.

PEKOVIC, S.; ROLLAND, S. Customer orientation and firm’s business performance: A moderated mediation model of environmental customer innovation and contextual factors. *European Journal of Marketing*, v. 50, n. 12, p. 2162–2191, 2016.

SIMANGUNSONG, E.; HENDRY, L. C.; STEVENSON, M. Managing supply chain uncertainty with emerging ethical issues. *International Journal of Operations and Production Management*, v. 36, n. 10, p. 1272–1307, 2016.

SOUCHON, A. L. *et al.* Spontaneity and international marketing performance. *International Marketing Review*, v. 33, n. 5, p. 671–690, 2016.

TACHIZAWA, E. M.; WONG, C. Y. Towards a theory of multi-tier sustainable supply chains : a systematic literature review. *Supply Chain Management: An International Journal*, v. 19, n. 5/6, p. 643–663, 2014.

TERJESEN, S.; PATEL, P. C.; SANDERS, N. R. Managing Differentiation-Integration Duality in Supply Chain Integration. *Decision Sciences*, v. 43, n. 2, p. 303–339, 2012.
THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.

---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.

---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.

---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

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---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

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---

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---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.

---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.

---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.

---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.

---

THOMÉ, A. M. T.; SCAVARDA, L. F.; SCAVARDA, A. J. The Management of Operations Conducting systematic literature review in operations management. *Production Planning & Control*, v. 27, n. 5, p. 408–420, 2016.

THOMPSON, J. D. *Selling: a managerial and behavioral science analysis*. [s.l.] New York: McGraw-Hill, 1973.
ZHANG, D.; LINDERMANN, K.; SCHROEDER, R. G. The moderating role of contextual factors on quality management practices. *Journal of Operations Management*, v. 30, n. 1–2, p. 12–23, 2012.