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MARKET PERFORMANCE IN THE HIGH-TECH MARKET: A SYSTEMATIC REVIEW

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ABSTRACT

Objective: To analyze the scientific production related to the market performance in the high-tech market from 1997 to 2019.
Method: Bibliometrics and systematic review methodologies were used. The search process was performed in the Web of Science and SPELL databases and resulted in the selection of 23 articles within the defined scope, among 82 studies. The selected studies were analyzed through descriptive statistics, Descending Hierarchical Classification (DHC) and Corresponding Factor Analysis (CFA).
Results: The results point to recent interest in measuring performance in the high-tech market, especially in emerging markets such as Taiwan and China, with the use of multidimensional indicators of a financial and non-financial nature. Through the DHC and CFA analyses, we have been able to observe four Classes - 'Internal Abilities', 'Alliances', 'Downstream Focus' and 'Upstream Focus' – and these dominant areas indicate the interest associated with market performance in the high-tech market.
Originality/relevance: The study innovates by proposing a protocol to perform textual analysis of scientific articles with the aid of Iramuteq software, enabling the identification of different approaches of the studies and grouping by similarities.
Contributions: We propose an agenda for future studies based on the results and gaps about performance and indicators used by companies in the high-tech market. From the managerial point of view, it is noteworthy that the most used indicators in this market are sales, market share and new product performance.

INTRODUCTION

In recent decades, the high-tech market has seen notable growth. This market is characterized by a high degree of uncertainty in the technological and consumer market, competitive volatility, research and development (R&D), rapid obsolescence of products, the internationalization of operations and the presence of network externalities (Mohr, Sengupta & Slater, 2010), and it also presents companies with a greater tendency of being oriented towards engineering and a product focus, instead of a marketing aspects (Mohr & Shooshtari, 2003, Mohr *et al.*, 2010, Vandenbroucke, Knockaert, & Ucbasaran, 2016).

Considering the countless complexities that make up the high-tech market, studies point to a gap in marketing studies in this area (Patterson & Dawes, 1999, Mohr & Shooshtari, 2003, Mohr *et al.*, 2010, Troung, 2017).

From this point of view, there is growing importance in measuring the effects of marketing on company performance, pointing out that researchers focus on studies related to marketing metrics (Clark & Ambler, 2001). On the other hand, studies about organizational performance have used a variety of methods and indicators, both financial and non-financial indicators, associating the results of these indicators with multidimensionality and dynamism in organizational performance (Gama, 2011).

Given the speed technology has delivered to business, new challenges in performance measurement are being imposed, especially in the high-tech market, due to the volatility, speed and uncertainties associated with this type of industry

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(Chiesa & Frattini, 2011, Ma, Yang, Yoa, Fisher & Fang, 2012, Kou & Lee, 2014).

Among the diverse facets involved in measuring the performance of these companies are those associated with marketing, the market-share, sales, commercial and brand aspects, and this study examines all of them under the overall term 'market performance'.

Within this context, this study is oriented by the following research question: What has been addressed in terms of market performance in the high-tech market? Thus, the main objective of this study is to present a panorama of the studies related to the market performance of high-tech firms, presenting the results of a systematic and bibliometric review of studies realized both internationally and nationally (in Brazil) during the period from January 1997 to February 2019.

This work will be composed of sections dedicated to theoretical assumptions about market performance, the methodological procedures used and the criteria for selecting the scientific articles, and then the main results will be presented and discussed. Finally, we will offer our conclusions and propose an agenda for future research.

THEORETICAL REFERENCES

In terms of what addresses performance within the market context in the literature, we can cite commercial, marketing, market-share, business, sales and brand performance. These terms have often been used by authors when they refer to company performance with a market focus, both in financial terms and intangible assets, such as quality, perception, and satisfaction, among other things, without there being a single theoretical thread about the consolidated conception of each type of mentioned performance (Varadarajan, 1986, Venkatraman & Ramanujan, 1986, Szymanski, Troy & Bharadwaj, 1995, Clark & Ambler, 2001).

The importance of marketing, as well as the understanding of the measurement of how marketing activities can influence company performance has been the object of a wide range of studies during the past few decades (for example, Varadarajan, 1986, Aaker, 1996, Clark, 1999, Clark & Ambler, 2001, Ambler, Kokkinaki & Puntoni, 2004, O'Sullivan & Abela, 2007; Gao, 2010, and Gama, 2011). The attention demanded in terms of marketing and business performance activities is driven by the desire to increase sales, market orientation and determine who should be responsible for performance (Clark & Ambler, 2001).

Studies indicate that the "capacity to measure marketing performance has had a significant impact on company performance, the rate of return, share returns, and the stature of marketing within the company" (O'Sullivan & Abela, 2007, p. 79). Eusebio, Andreu and Belbeze (2006) consider *marketing performance* to be measures of marketing efficiency, or in other words, marketing performance is measured by a wide array of indicators as to which marketing activities have been effective. Gao (2010), using other studies, defines marketing performance as a multidimensional process, in which the efficiency and effectiveness of marketing activities is related to market objectives, such as revenues, growth and market-share. Even though there are various studies about marketing performance (Gao, 2010, Guissoni & Neves, 2013), there is no consensus about this concept (Gao, 2010, Wu, 2011) and various metrics and financial and non-financial indicators are used (Clark, 1999), because there is no consolidated measure of performance, that is, they vary in relation to their context and relevance (Ambler & Kokkinaki, 1997, Lau & Bruton, 2011, Gama, 2011).

Another aspect is that the brand in its breadth of concept represents a company's potential differentiation from others, because it is a source of tangible and intangible returns, making it relevant to the measurement of performance. According to Ehrenberg, Uncles and Goodhardt (2004), a brand's sales are determined by measures in terms of how many customers purchase the brand and with what frequency, and how often they purchase other brands. Louro (2000) summarizes, based on other studies, that the conventional measures of brand performance are notoriety, association/differentiation, perceived quality/leadership, loyalty and market. Each of these measures is composed of different combinations of indicators depending on the context investigated, which can lead to a better explanation of the brand's performance.

Another focus of market performance in the high-tech area has been commercial performance, which translates into the commercial balance between countries, considering that there is an internationalization of a large portion of manufacturing in this sector, which can lead to fragmented activities, where more complicated steps technologically are developed in one part of the

world and others that require more labor are executed in other countries (Rauen & Furtado, 2014).

Thus, there are a wide array of metrics and indicators that are part of the list of items that need to be selected to measure marketing, market, sales, and/or brand performance, such as: market share, sales, return on investment (ROI), return on capital (ROC), return on equity (ROE), return on assets (ROA), number of new products, number of customers, reputation, customer satisfaction, profit, share values, market acceptance and brand equity (Varadarajan, 1986, Venkatraman & Ramanujan, 1986, McKee, Varadarajan & Pride, 1989, Aaker, 1996, Szymanski *et al.*, 1995, Ambler & Kokkinaki, 1997, O'Sullivan & Abela, 2007, Lew, Sinkovics & Kuivalainen, 2013).

However, according to Lau & Bruton's synthesis (2011, p. 375) "it may be problematic to measure company performance in ventures, especially those in the high-tech area". The authors suggest using several types of measures and cite as an example that it would be preferable to use a sales measure rather than profits for young technology companies, because sales may be more essential to their survival, and the development of new products is also a critical factor for high-tech companies (Lau &Bruton, 2011).

It also must be considered whether performance indicators can be classified as objective or subjective. The objective indicators are those that are obtained through objective and valid data, such as financial and company report data (secondary data). Due to the difficulty in accessing this data (Bruton & Rubanik, 2002), researchers have been testing and validating self-reported data as objective data. Subjective data (perceptions) are those whose information generally is collected based on scales (Dess & Robinson, 1984, Venkatraman & Ramanujam, 1987, Baker, Gibbons & Murphy, 1994, Perin & Sampaio, 1999). In the market area, researchers have also sought to test, compare and validate objective and subjective data, as well as creating models to measure company performance using subjective data and/or both objective and subjective. Nonetheless, they emphasize that there may be gaps between subjective measures and what does in fact occur, and demonstrate that there is no standard among possible indicators in different markets (Pelham & Wilson, 1996, Dawes, 1999, Harris, 2001, Wall *et al.,* 2004, Morgan, Vorhies & Mason, 2009, Santos & Brito, 2012, Chen *et al.*, 2017, Bayraktar, Hancerliogullari, Cetinguca & Calisir, 2016). This leads to new questioning: Which compositions of performance indicators are used to measure market performance in the high-tech market? What types of measures and what data sources are most often considered?

Based on the above, this study will consider commercial, marketing, market, sales and brand performance, which can be synthesized as a broader notion of 'market performance', making it possible to a greater range when it is intended to investigate the recent scenario of research on the subject in the context of the high technology market.

PROCEDURES AND METHODS

This study is qualitative and quantitative, using systematic review methodologies, which is a structured method for identifying relevant studies on a particular theme (Rother, 2007; Dybå & Dingsøyr, 2008); and bibliometrics that assists in the analysis of scientific production, making it possible to delineate an overview of the development and behavior of a knowledge area. (Araújo & Alvarenga, 2011; Vanti, 2002). We conducted a search of the academic production from January 1997 to February 2019, opting to use two databases: the *ISI Web of Science* – which consisted of searching its more than 12,000 indexed journals, and finding those classified with *Journal Citation Reports (JCR)* impact factors, as well as articles which are available in other databases, such as *ProQuest*, *Scopus* and *Wiley* (Pereira, Carvalho & Rotondaro, 2013); and *Spell* – which searches Brazilian journals in the areas of Administration, Accounting and Tourism.

The data collection was realized based on the *ISI Web of Science,* using the following keywords: "*brand performance* AND *high-tech**", "*brand-performance* AND *high-tech**", "*market*-performance* AND *high-tech**", "*sales-performance AND high-tech**", "*commercial-performance* AND *high-tech**" and in the SPELL database, we used the keywords: "desempenho de marca e alta tecnologia (brand performance and high-tech)", "desempenho de mercado e alta tecnologia (market performance and high-tech)", "desempenho de vendas e alta tecnologia (sales performance and high-tech)", "desempenho de marketing e alta tecnologia (marketing performance and high-tech)", "desempenho comercial e alta tecnologia (commercial performance and high-tech)". First, we considered theoretical-empirical studies that had some of these keywords in their text. A total of 82

articles were found, and of these 72 were published in international journals and 10 in national journals. Next we read the titles and abstracts of these studies with the intention of determining whether they were in line with the purpose of this study, which narrowed our list down to 38 articles. After reading these articles in their entirety, we winnowed our list down to the final 23 articles (of this total just one was national), which comprise our analysis sample, selecting them based on the following criteria: the research data came from the high-tech market and the measurement indicators were explicitly mentioned. Figure 1 represents a schematization of the procedures used to select our study sample.

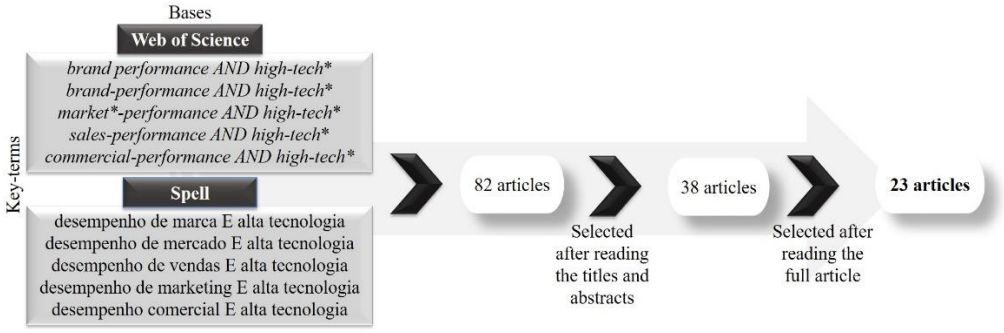

Figure 1. Protocol for selecting the study's articles

To proceed with the bibliometric review of the selected articles we used the 'Bibliometrix Package' from the R software which made it possible to characterize our sample. Then for the purpose of the study we propose a protocol for performing textual analysis utilizing the *IRAMUTEQ* 0.7 software (*Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*) (Ratinaud, 2014). To do this, it was necessary to construct a *corpus* (a group of texts that we intended to analyze) composed of the title, abstract and keywords of the selected studies. For better congruence of the results, we added to the *corpus* loads of the representativeness of these studies, that is, after systematically reading the articles, we identified the general terms and micro-themes and these were added to the *corpus* so that the semantic contexts formed would be more representative of the studies. We also considered descriptive variables: the geographic area of the study (countries/regions); the study's nature (qualitative, quantitative, or qualitative and quantitative); type study (cross-sectional, longitudinal or both together); and the type of performance indicator adopted in each study (objective, subjective or both together). The protocol of the *corpus* for analyzing the scientific articles can be verified in Figure 2.

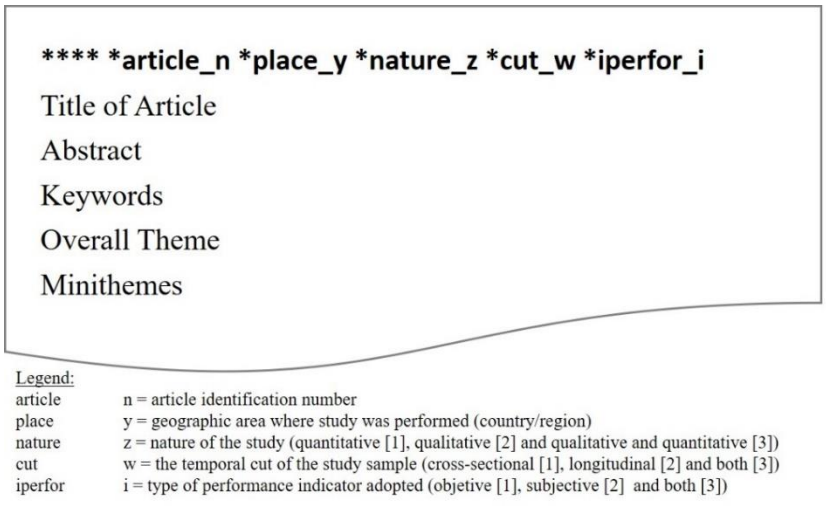

Figure 2. Protocol of the composition of the *corpus* for analyzing the scientific articles
Source: Prepared by the authors

After the verification and the validation of the *corpus,* we realized analyses of the word cloud, the Descending Hierarchical Classification (DHC) and the Corresponding Factor Analysis (CFA). The word cloud makes it possible to visualize the lexicography of the most representative words in the investigated *corpus*. Given that the market performance was being investigated for a specific sector, we considered it relevant to realize a DHC.

The DHC made it possible to realize a lexical analysis and a grouping of similar vocabulary within the corpus which was distinct from the text segments made from other groups through various tests of type X^2 (see Reinert, 1983,1990). The segment analysis of the text is presented through the DHC dendrogram, which makes it possible to verify the relationships between classes. In other words, this analysis makes it possible to know statistically the panorama of how the studies that make up the sample are similar or dissimilar from each other. Based on the classes formed by the DHC, the program *Iramuteq* realized the CFA, which permitted the representation of *clusters* in a cartesian plan formed by the most characteristic text segments for each class and the variables associated with each one of them, demonstrating the existing interrelationships (Camargo, 2005, Camargo & Justo, 2013). All of these analyses together made it possible to get a better understanding of what is being addressed in terms of market performance within the context of the high-tech market.

ANALYSIS AND DISCUSSION OF THE RESULTS

For a more congruent understanding of the results, Table 1 displays the 23 studies that make up the bibliometric study, the type of data collection used and the respective samples for each study. It should be emphasized that just one Brazilian study was part of our sample, revealing how little this area has been explored in national research.

Table 1
Analyzed Scientific Production

Autores		Amostra	Autores		Amostra
Li & Atuahene-Gima (1999)	C	$114^{F}{}_{128p}$	Patel (2014)	L	305^{F}
Aaker & Jacobson (2001)	L	$9^{F}{}_{206f}$	Rauen & Furtado (2014)	L	16^{N}
Atuahene-Gima & Li (2002)	C	$150^{F}{}_{347s}$	Kou & Lee (2015)	C	242^{F}
Chang, Lin, & Sheu (2002)	C	87^{F}	Kou, Lee & Wei (2015)	C	$29^{F}{}_{237M}$
O'Sullivan & Abela (2007)	L	$312^{M}{}_{176f}$	Oh, Cho & Kim (2015)	L	2496^{F}
O'Sullivan, Abela & Hutchinson (2009)	L	$157^{M}{}_{128f}$	Wang, Chen, Yu & Hsiao (2015)	L	1086^{YF}
Chiesa & Frattini (2011)	C	8^{IL}	Vandenbroucke *et al.* (2016)	L	80^{F}
Wu (2011)	C	172^{F}	Moghaddam, Bosse & Provance (2016)	L	151^{F}
Lau & Bruton (2011)	C	150^{F}	Nguyen, Yu, Melewar &Gupta (2016)	C	182^{F}
Ma *et al.* (2012)	C	142^{F}	Wu & Lin (2016)	C	312^{R}
Lew *et al.* (2013)	C	110^{F}	Mukarram *et al.* (2018)	L	121^{F}
Fuertes-Callén & Cuéllar-Fernández (2014)	L	142^{F}			

Legend: F – firms; p – projects; M – managers; f – observations of financial data; IL – innovations launched; s – salesmen (157 from China + 190 from the USA); N – nations; YF – firm-year observations; R – respondents; C – cross-sectional study; L – longitudinal study.

Even though the examined period spans 22 years from 1997 to 2019, the first publication within our market performance focus on the high-tech area, according to our search criteria, only occurred in 1999, and the subsequent decade, from 2000 to 2009, occurred 5 publications, which is equal to 21.7% of all the articles analyzed. From 2010 to 2018, 17 articles (73.9%) are found in our sample, with the years 2015 and 2016 having four articles apiece. This

data suggests that attention has been given to the market performance of high-tech firms only recently.

Of our total sample, 21 studies are quantitative in nature, which represents 91.3% of the sample, one is qualitative in nature (4.3%) and one is both quantitative and qualitative (4.3%). Most of the studies use a cross-sectional sample (52.2%), its means that the data collected for analyses was for the most part collected by the survey method. Regression analysis is among the most used data analysis methods in our sample, and it represents in its diverse forms 56.7% of the studies. Other methods of analysis identified were structured equation modeling (23.3%), confirmatory factor analysis (10%), content analysis, mathematical equations and Cox's proportional risk model, with each of these methods having a 3.3% participation. Statistical analyses are present in 95.24% of the studied cases. The relative graphic representations of the quantity of publications per year and the nature of the studies, along with the time sample and the analysis methods used are displayed in Figure 3.

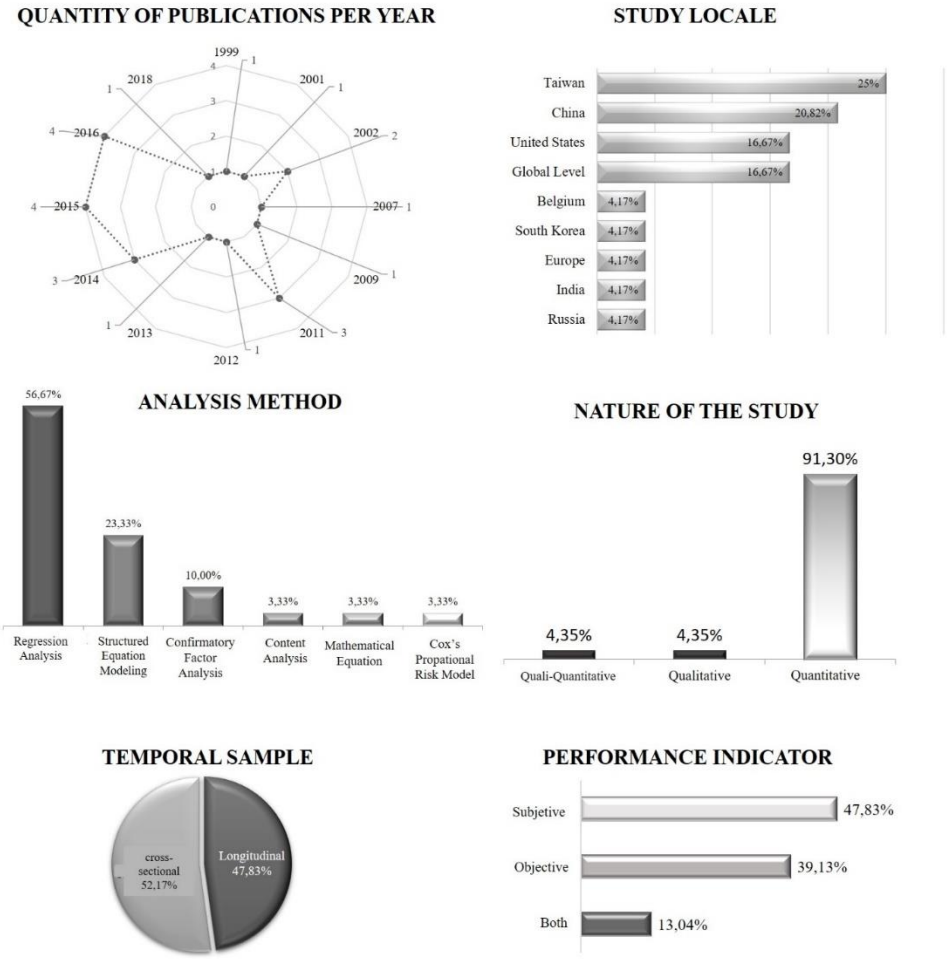

Figure 3. Characterization of the Studies

The geographic areas of the high-tech companies as well as their market performance are displayed in Figure 3 in which you can observe the concentration of studies in Asia, with Taiwan, China and South Korea representing 48% of the studies, followed by the global level (companies from countries in various continents) and the United States, whose representativeness of each one was 16% of the studies. It should be noted that Taiwan has distinguished itself on the global level as being one of the main manufacturers and strategic partners in the high-tech production market (Kou & Lee, 2015).

The measurement of market performance in the high-tech sector presents variations in terms of the composition of performance indicators used, as well as the authors' use of more than one dimension to classify them, as is displayed in Table 2. The variety and multidimensionality of the identified

performance indicators is aligned with the theoretical reports of Venkatraman and Ramanujan (1986), Bruton and Rubanik (2002), Gao (2010) and Gama (2011), with the preference in this market being to use various measures of performance (Lau & Bruton, 2011).

However, it was possible to identify that sales and market share and the preoccupation with measuring the performance of new products are used in 52.17%, 43.48% and 26.09% of the studies, respectively. Their relevance as indicators in the high-tech market corroborates the theoretical aspects emphasized by Lau and Bruton (2011), who regard these factors as critical to the survival of high-tech ventures.

There is a predominance in the use of subjective indicators to measure market performance, which represent 47.83% of the cases investigated, followed by objective indicators (39.13%), and both approaches with 13.04%. The incidence of measuring by indicators on a scale of "n" points occurrs in 12 studies (52.17%), having the same quantity of measuring through secondary sources of data, or 86.96% of the studies that use one or another or both of the cited data sources.

Table 2
Performance Indicators from the Perspective of Study Authors

Performance Classification	Authors	Composition of Performance Indicators	Measurement Type	Data Source
Benefit perceived by consumers and accepted by the market	Patel (2014)	Number of banking services perceived as being beneficial to customers. Number of users registered online on the transactional website.	Objective	SD
Commercialization of Innovation	Chiesa & Frattini (2011)	Volume of Sales. Attitude of first adopters (positive or negative) and success in adoption network.	Both	SD & HE
Performance	Wu (2011)	Number of patents, success rate of new products and innovation rate of new products, all relative to the biggest competitor, and the first to enter the market with a new application.	Subjective	SE
Commercial Performance	Rauen & Furtado (2014)	Commercial balance = exports over imports.	Objective	SD
Company Performance	O'Sullivan & Abela (2007)	Growth of sales, market share, rate of return, return over assets (ROA) and return over shares.	Both	SE & SD
	O'Sullivan *et al.* (2009)			
	Lau & Bruton (2011)	Sales performance (growth of sales and market share), new product performance (new products on the market and R&D expenses), efficient production performance (production capacity and efficiency).	Subjective	SE
	Oh *et al.* (2015)	Sales and operational profits.	Objective	SD
	Wang *et al*. (2015)	Return over assets (ROA), Return over equity (ROE) and Tobin's Q (Tobinq).	Objective	SD
	Mukarram, Saeed, Hammoudeh & Raziq (2018)	Measured by Tobin's Q (ratio between the market value and the company's total assets and their replacement value).	Objective	SD
Marketing Performance	Kou & Lee (2015)	Average growth of market share, average growth of sales and growth of average sale (US$).	Subjective	SE
	Kou *et al*. (2015)			
Market Performance	Lew *et al*. (2013)	Growth of sales, market share, number of new products, number of new customers, increase in reputation and overall performance.	Subjective	SE
	Fuertes-Callén & Cuéllar-Fernández (2014)	Number of new customers, number of renewed contracts and market share.	Objective	SD

	Moghaddam *et al.* (2016)	Firm valuation.	Objective	SD
	Nguyen *et al.* (2016)	Market growth, market share, profits, ROI and customer satisfaction.	Subjective	SE
	Vandenbroucke *et al.* (2016)	Time taken to launch the first product and number of products.	Objective	QD & SD
New Product Performance	Li & Atuahene-Gima (1999)	The dimension of market performance (internal satisfaction, product quality, sales volume, product acceptance, market share and profits). The dimension of punctuality in developing a product.	Subjective	SE
	Ma *et al*. (2012)	Innovation, speed of product's market entry (internal satisfaction with sales volume, product market performance and financial return).	Subjective	SE
	Kou & Lee (2015)	Sales volume, profits and customer satisfaction.	Subjective	SE
	Kou *et al*. (2015)			
Sales Performance	Atuahene-Gima & Li (2002)	Market share, sales volume, sales of new products and achieving sales targets.	Subjective	SE
Business Performance	Chang *et al.* (2002)	Rate of net profits and growth rate of sales.	Subjective	QD
Financial Performance	Aaker & Jacobson (2001)	Accounting return and Return over shares.	Objective	SD
Technological Performance	Vandenbroucke et al. (2016)	Time until first patent and number of patents.	Objective	QD & SD
Technological Intensity	Rauen & Furtado (2014)	R&D (R&D spending) / GPV (Gross Production Value)	Objective	SD
Perceived Value and Brand Loyalty	Wu & Lin (2016)	Brand loyalty = buying intentions, loyalty and brand commitment; Value perceived by the customer/Brand cost/benefit.	Subjective	SE

SE – Scale Evaluation; HE – Historical Evaluation; QD – Data Obtained through Questionnaires; SD – Secondary Data

It was possible to verify the representativeness of the studies that have approaches in common through the word cloud method. The lexicographic formations of the words with the highest representativeness (Figure 4) are: 'firm, innovation, high-tech, market, product, effect and performance'. This result reveals that the study sample is emblematic within the proposed context of investigation.

Figure 4. Word Cloud

With the intention of presenting a panorama of the studies related to market performance in the high-tech market, we performed a DHC, considering each study as a unit of initial context (UIC). In this way, the *corpus* was composed of 23 UICs, which were the origin of 107 units of elementary context (UECs). The rate of UECs retained for analysis (which are explained by the results) was significant (78.5%), and they were considered to be significant variables in the analysis of active variables (lemmatized words) and descriptive variables with $X^2 \geq 3.84$ (p-value ≤ 0.05). Through the DHC statistical treatment, we obtained four classes of more similar text segments that correlated with the descriptive variables. It was possible to identify how the best studies were closer or further apart, even considering market performance within the investigated context (Figure 5). Based on the DHC, we realized a CFA which helped us, in a more dynamic manner, understand the most important relationships between the variables in a factor plan (Figure 6).

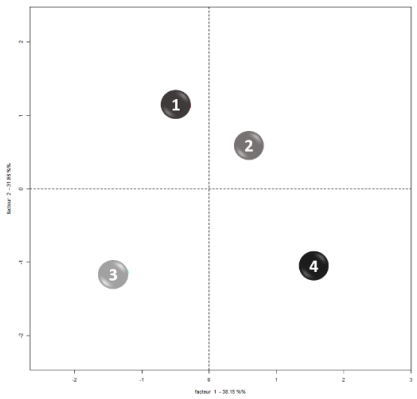

Figure 5: Location of the Classes in the Factor Plan

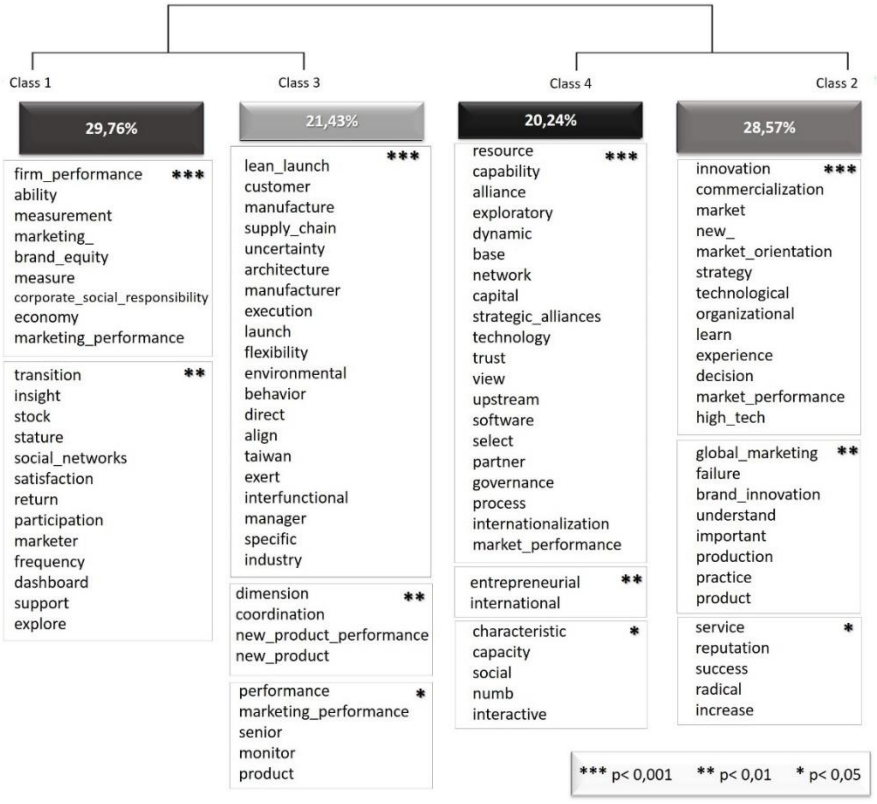

Figure 6: Dendrogram of the Investigated Sample

It should be noted that, due to the sample, some studies cannot be cited in the analyses, because they did not present a sufficient degree of significance in the statistical tests, given that the first plan considers the grouping of semantic contexts. The analysis of the modalities that best contribute to the formation of factor axes permitted the identification of distinct oppositions in relation to other subjects that were covered in these studies. It should be added that these oppositions should be understood as differences in focus within the studied context. Thus, the greatest attention should be given to the opposition of classes: 1 and 4; and 3 and 2.

In relation to "Class 1 – Internal abilities," we can perceive that it is the largest in terms of representativeness (29.76%) and is in the quadrant opposite Class 4. It is best represented by studies by Li and Atuahene-Gima (1999)***, Aaker and Jacobson (2001)*, O'Sullivan and Abela (2007) ***, O'Sullivan *et al.* (2009)***, Lau and Bruton (2011)***, and Wang *et al.* (2015)***, qualitative and quantitative studies, realized in China and Russia ***(100%) and Europe*(62.5%). The focus is centered on investigating causal relationships between performance and other variables. The investigated performances, according to the authors, were new products, market (Li & Atuahene-Gima, 1999), financial (Aaker & Jacbson, 2001) and firm (O'Sullivan & Abela, 2007, O'Sullivan *et al.,* 2009, Lau & Bruton, 2011, Wang *et al.*, 2015). These studies tend to investigate the obtained performance in relation to other internal measurements, such as, for example, the punctuality of product development, production capacity, project formalization, departmental power, CEO satisfaction, the generation of marketing reports, strategic orientation, corporate development and social responsibility.

"Class 4 - Alliances" is the smallest class (20.24%) and is best represented by the studies Ma *et al.* (2012)***, Lew *et al.* (2013)***, and Moghaddam *et al.* (2016)***, studies with a longitudinal time sample** (36.11%) and a global geographic area of study **(47.06%). This group has a greater focus on market performance related to strategic alliances, dynamic capacity, the management of resources (strategic, technological and marketing), partner relationships and internationalization. In order words, its main focus is on the market and the expansion of business.

In the analysis of the factor opposition of Classes 1 and 4 in function of the lexicographic context that represents them, we may observe that Class 1 indicates studies whose focus on performance is centered around measurements that point to a greater internal focus. Meanwhile, Class 4 is mostly focused on the market, and specifically the expansion of business / internationalization.

"Class 2 – Downstream Focus" (28.57%) is best represented by the studies of Chiesa and Frattini (2011)***, Wu (2011)*, Fuertes-Callén and Cuéllar-Fernández (2014)***, Oh *et al.* (2015)***, Nguyen *et al.* (2016)***, and Vandenbroucke *et al.* (2016)*, which are qualitative studies ***(100%), and studies realized in South Korea***(100%) and in Belgium*(100%). This class has a significant focus on the market, more specifically 'market orientation' and 'market performance', and in 'innovation.' It is more associated with the marketing resources, marketing strategies, commercialization and the success/reputation of innovations/new products. These studies cover the high-tech market on both a broad level and more specific ones, such as startups and service industries, that directly and/or indirectly mention the final consumer to deal with performance. Some studies relate brands in a general way, directly (Nguyen *et al.*, 2016) and indirectly (Chiesa & Frattini, 2011), with the measuring of performance.

In terms of "Class 3 – Upstream Focus" which is in the quadrant opposite of Class 2, it constitutes 21.43% of the sample, and is best represented by the studies Chang *et al.* (2002)***, Kou and Lee (2015)***, Kou *et al.* (2015)***, studies realized in Taiwan*** (70,83%), with a cross-sectional sample *** (37,5%) and all the studies in this class are characterized by adopting subjective performance indicators**. This *cluster* groups together studies oriented towards the manufacturing and supply chain industries, the preoccupation with environmental uncertainties in the high-tech market, as well as a focus on partnerships and customers. There is one study (Chang *et al.*, 2002) which relates flexibility in manufacturing with business and sales performance, while other studies (Kou & Lee, 2015, Kou *et al.*, 2015) relate *lean launches* (agile, low cost releases) which aggregate value for the performance of new products and marketing.

In the analysis of the factor opposition of Class 2 and Class 3, due to the lexicography that they represent, we can observe in Class 2 that performance is more related to the final consumer

market, while Class 3 points out the studies whose focus is on performance, centered on measurements related to production.

Despite the fact that it was not possible to identify a pattern in the types of classification of the indicators used in the high-tech market, there was a greater use of certain terms, such as "company performance" within "Internal abilities," the term "market performance" within the classes "Alliance" and "Downstream Focus" and the term "new product performance" in the class "Upstream Focus," which may indicate a tendency towards consensus in the type of classification used for performance with focuses of interest.

FINAL CONSIDERATIONS

This study seeks to contribute to the academic production of this market performance field, with a special focus on the high-tech market, covering studies between 1997 and 2019. It should be emphasized that this study is not intended to be exhaustive in terms of the literature that is associated with this subject for the investigated time frame, due to the restriction of the journals indexed in the *Web of Science* database, and examining those which have impact factors in the *Journal Citation Reports (JCR)* and the Brazilian database *Spell*.

Our investigation has made it possible to identify, based on the utilized keywords, that just one study, published in a journal indexed by the national database *Spell* matches our proposed area of study, which thus reveals a gap in studies of this area in Brazil. These results enable us to observe a recent interest in the development of studies devoted to the measuring of performance in high-tech companies, with an emphasis on emerging countries such as Taiwan and China, which are of great importance to the international market; and for the multidimensional use of indicators to measure the market performance of companies, as well as thematic focuses associated with marketing used in the analysis of this market.

We did not identify a consensus among authors in terms of the classification, types and dimensions relative to market performance, with there being a myriad of financial indicators (such as sales volume, share value, ROE and ROA, etc.) and non-financial indicators (market participation, satisfaction with product quality, customer satisfaction, production and innovation process efficiency, and successful partnerships, etc.), in which a greater frequency of the measurement of indicators linked to sales, market share, and new product performance, signals the importance of these factors in the high-tech market.

The proposed textual analysis protocol proved to be valid, considering that the DHC and CFA analyses resulted in the formation of four Classes – 'Internal Abilities', 'Alliances', 'Downstream Focus' and 'Upstream Focus' – which respectively deal with: measuring the relationship between internal marketing activities and company performance; the management of partnerships and business expansion resources and internationalization; market orientation and product innovation focused on the end consumer; and finally the aggregation of valor in the supply chain through production efficiency. The correlated data reiterates the potential of new studies of market performance, specifically those within the context of the high-tech market, and offers material for managers seeking more robust measurements of performance.

We may observe, based on the analyzed studies, the consistent potential of the continuity of studies in this area due to the small number of studies found that deal with market performance, mainly in the national market (Brazil). More specifically, we have observed a gap in the investigation of brand performance in this market. Even some of the few studies that we have found that deal with brands and performance do not mention brand performance. It is suggested that future studies should investigate brand performance in the high-tech market, as well as the construction of stronger brands and brand innovation within this market, given that these studies indicate that there is greater emphasis placed on the product. Another gap refers to the identification of the best and most efficient indicators to measure market performance in high-tech companies, and it is suggested that new studies should be made in this area, that is, which indicators have been used by the most successful high-tech companies? We also suggest that future studies should broaden the quantitative basis of their searches (ex. Latin American databases), using the snowball method to identify a wider array of studies on this subject in future literature reviews.

Moreover, despite the limitations of the present study, the inferred results ratify the potential for new studies related to market performance, specifically

within the context of the high-tech market, in the sense of contributing to a more robust theoretical network to promote the furthering of the addressed theoretical-empirical knowledge, as well as broadening the possibilities for future generalizations of results.

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DESEMPENHO MERCADOLÓGICO NO MERCADO DE ALTA TECNOLOGIA: UMA REVISÃO SISTEMÁTICA

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RESUMO

Objetivo: Analisar a produção científica relativa ao desempenho mercadológico no mercado de alta tecnologia no período de 1997 a 2019.
Método: Foram utilizadas as metodologias de bibliometria e revisão sistemática. O processo de busca foi realizado nas bases Web of Science e SPELL e resultou na seleção de 23 artigos dentro do escopo definido, dentre 82 estudos. Os estudos selecionados foram analisados por meio de estatística descritiva, Classificação Hierárquica Descendente (CHD) e Análise Fatorial de Correspondência (AFC).
Principais resultados: Os resultados apontam um recente interesse sobre a mensuração de desempenho no mercado de alta tecnologia, sobretudo nos mercados emergentes como Taiwan e China, com o uso de indicadores multidimensionais, financeiros e não financeiro. Por meio das análises de CHD e AFC observou-se a formação de quatro Classes – 'Habilidades internas', 'Alianças', 'Foco a jusante' e 'Foco a montante' – cujas temáticas predominantes explicitam os focos de interesse associados ao desempenho mercadológico no mercado de alta tecnologia.
Relevância/originalidade: O estudo inova ao propor um protocolo para realizar análises textuais de artigos científicos com auxílio do software Iramuteq, possibilitando a identificação dos diferentes enfoques dos estudos e agrupamento por semelhanças.
Contribuições: É proposta uma agenda de estudos futuros em função dos resultados e de lacunas sobre desempenho e indicadores utilizados pelas empresas no mercado de alta tecnologia. Sob o prisma gerencial, destaca-se que os indicadores mais utilizados nesse mercado são as vendas, a participação de mercado e o desempenho de novos produtos.

PRECARIZACIÓN DEL TRABAJO Y MIGRACIÓN: UNA REVISIÓN DE LA LITERATURA INTERNACIONAL

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RESUMEN

Objetivo: Analizar la producción científica relacionada con el desempeño del mercado en el mercado de alta tecnología de 1997 a 2019.
Método: Las metodologías Bibliometría y revisión sistemática se utilizaron. El proceso de búsqueda se realizó en las bases de datos Web of Science y SPELL y resultó en la selección de 23 artículos dentro del alcance definido, entre 82 estudios. Los estudios seleccionados se analizaron mediante estadística descriptiva, clasificación jerárquica descendente (CHD) y análisis de factores de correspondencia (AFC).
Resultados principales: Los resultados apuntan al interés reciente en medir el desempeño en el mercado de alta tecnología, especialmente en mercados emergentes como Taiwán y China, utilizando indicadores multidimensionales, financieros y no financieros. A través de los análisis CHD y AFC, se formaron cuatro clases – 'Habilidades internas', 'Alianzas', 'Enfoque descendente' y 'Enfoque ascendente' – cuyos temas predominantes explican el foco de interés asociado con el desempeño del mercado en el mercado de alta tecnología.
Relevancia/Originalidad: El estudio innova al proponer un protocolo para realizar análisis textuales de artículos científicos con la ayuda del software Iramuteq, que permite la identificación de diferentes enfoques de los estudios y agrupación por similitudes.
Contribuciones: Se propone una agenda de estudios futuros basada en los resultados y las brechas en el desempeño y los indicadores utilizados por las empresas en el mercado de alta tecnología. Desde el punto de vista gerencial, es notable que los indicadores más utilizados en este mercado son las ventas, la participación en el mercado y el rendimiento de los nuevos productos.

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