How To Measure Competitive Intensity?

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Abstract

In this research, we analyse the internal structure of competitive intensity on the basis of competitive dynamics. We propose a measure of competitive intensity based on two dimensions: strategic and tactical. This two-dimensional design makes it possible to gain a better understanding of the competitive battle, allowing managers to improve operations and the allocation of resources, according to both dimensions. It also provides a better understanding of the relationship between competitive intensity and other variables.

Keywords: Competitive intensity, Competitive dynamics, New product, Strategic decisions, Tactical decisions.

Introduction

A dynamic interpretation of competition is one of the recent trends in strategic management research (Chen and Miller, 2012). With this approach, competitive intensity is identified as a threat factor affecting the ability of firms to maintain a long-term competitive advantage (D'Aveni, 1994), and influencing the performance and success/failure of new products (Cooper, 1979; Cooper, 1984; Cooper and de Brentani, 1991; Cooper and Kleinschmidt, 1987; Cooper and Kleinschmidt, 1990; Gonzales-Benito *et al*., 2014; Lee and O'Connor, 2003; Muller, 2005; Song and Parry, 1997).

Despite the importance of competitive intensity, its internal structure has been neglected. Nevertheless, an improved knowledge of its workings provides for a better understanding of the competitive environment in a market, and leads to more appropriate management decisions (Ketchen*et al*., 2004). The present research attempts to fill this gap by studying the internal structure of competitive intensity, through the identification of its dimensions.

Competitive intensity allows the competition observed in any given market to be

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characterized. It corresponds to the degree of competition exerted by competitors in a market (Chen, 1996). Competitive battle in a market leads to two types of action: strategic and long-term actions involving major investments, which are generally designed to make an offer that is more attractive to buyers than that proposed by competitors (Abell, 1980; Ailawadi*et al*. 2001; Bowman and Gatignon, 1995; Chen and Lii, 2005; Chen *et al*., 1992; Lemmink and Kasper, 1994; Ramaswamy *et al*., 1994; Thompson, 1987; Urban and Hauser, 1993), and tactical actions leading to only minor modifications. This is a question of short-term investments, whose purpose is either to curb competitors' sales, or to temporarily boost a company’s own sales. Strategic actions, on the other hand, require a greater mobilization of resources and are accompanied by major changes in the company's strategic orientation (Thompson, 1987) and in the definition of its sphere of business (Abell, 1980). In the short term, these expenses often have a negative impact on profits, whereas their long-term impact can be extremely positive. This research suggests that competitive intensity has a two-dimensional nature, because it occurs at two different levels. However, the literature dealing with the operationalization of competitive intensity, through the observation of actions and responses in a market, reveals a rather one-dimensional posture and makes no distinction between strategic and tactical decisions (Cooper and Kleinschmidt, 1990; Gonzales-Benito *et al.*, 2014; Jaworski and Kohli, 1993; Lee and O’Connor, 2003; Pulendran*et al*., 2000). Nonetheless, strategic and tactical decisions do not have the same temporalities and consequences (Chen and Miller, 1994; Smith *et al*., 1991). According to Lee and O’Connor (2003), for example, a high level of competitive intensity corresponds to an intense battle over price, distribution or advertising. Pulendran*et al*. (2000) consider this same battle in terms of price and promotion. Finally, according to Muller (2002), although this author accepts that there is a correlation between competitive intensity and the degree of competition in a market, the instruments used by competitors are not specified.
The aim of this research is to study the internal structure of competitive intensity, and to explore the possibility of developing a two-dimensional structure. To do this, we firstly present the methods used to measure competitive intensity in previous research. We then expand the notion of competitive intensity using a qualitative study, and present our approach to the development of a measurement scale. Finally, we discuss the theoretical and managerial implications, as well as some thoughts about the limitations of this study.

Literature Review

Competitive intensity has been central to research on strategic groups (Porter, 1979; Caves and Porter, 1977; Cool and Dierickx, 1993; Peteraf, 1993) or multi-market competition (Amine and Bensebaa, 2005; Fuentelsaz and Gomez, 2006; Gimeno, 1999; Gimeno and Woo, 1999; Jaychandran*et al*., 1999). Although it is widely used in management sciences, with 1100 publications noted at the end of 2014 (Kwiecinski, 2017), very few authors have focused on defining this concept. According to Porter (1980, 2008), one of the founders of the structuralist conception of competition, competitive intensity is identified as one of the five forces determining the attractiveness of an industry and expressing the exchange of competitive movements[2]. Along similar lines, Auh and Menguc (2005) define competitive intensity as a situation where competition is fierce, due to the number of competitors and the lack of growth opportunities in the market. In contrast to this approach, Chen (1966) relies on a "behavioural" perspective in which competition is considered to be a set of decisions (Jacquemin, 1985; Foss and Mahnke, 1999; Le Roy, 2004; Porac*et al.*, 1995). In line with the works of D'Aveni (1994) and his concept of hyper-competition, Chen (1996) defines competitive intensity as the degree of aggressiveness and the speed of actions and responses taken by firms to compete in a market. Using individual competitive movements as a unit of analysis, it proposes to analyse the competitive battle as a chain of actions and reactions between companies or brands in a situation of competitive interdependence (Chen *et al.*, 1992). Finally, according to Muller (2002), competitive intensity reflects the number of companies competing in the market and the fierce competition they face in this market. This author takes into account, in the definition of competitive intensity, its partial nature, i.e. the fact that in some cases competitive intensity may not be relevant to all competitors in the market.

In this research we study the competition between brands in a given market. The competitive battle finds its origins in the fact that brands must share the market, and that with the aim of maximizing profits, each competitor tries to increase its sales. An increase in sales can have two origins: either the conquest of new consumers, or the conquest of consumers from other brands, leading to an increase in market share. Competitive intensity is thus a sign of the difficulty experienced by brands in increasing their sales, other than by increasing their market share. This conflict for market share can lead to two types of action: the conquest of superior positioning, or that of improved attractiveness resulting from positioning emphasis. We thus adopt the following operational definition for competitive intensity: competitive intensity is the degree to which competitors fight to improve their market share; it is expressed either by the search for superior (strategic) positioning, through the use of a more effective (tactical) supply support policy, or through a combination of both of these.

While it is rare to encounter a definition for competitive intensity, there is abundant management science literature dealing with its operationalization. In previous studies we have identified different approaches to measuring the degree of competitive intensity. They differ in several respects: the notion of competition (structuralist or behaviourist), the level of analysis (micro or macro), the dyadic (two competitors) or market-level (all competitors) approach, the unit of analysis (brands or businesses); and finally the analytical perspective (behaviour of consumers or competitors).

With the structuralist approach, competitive intensity is measured either by the number of competitors in a market, or through the use of different concentration ratios (Abramo*et al.*, 2012; Becker and Dietz, 2004; Caves *et al.*, 1984; Chen *et al.*, 2015; Fischer and Kamerschen, 2003; Giachetti and Dagnino, 2014; Jermias, 2006; Ju and Zhao, 2009; Lijesen*et al.*, 2002; Porter, 1980; Vroom and Gimeno, 2007; Scherer and Ross, 1990; Souare, 2013; Wu, 2012; Wu and Pangarkar, 2009). The most commonly

[2] Porter uses the term "rivalry".Although some researchers (Chen, 1996; Gimeno and Woo, 1999) use this term to express the degree of competitive battle between two competitorsonly, the terms rivalry and competitive intensity are used interchangeably.

used index is that of Herfindahl, calculated by summing the squares of the market shares of **n** competitors. The higher the value of this indicator, the more concentrated and less competitive the sector. In this approach, the actual behaviour of competitors is not taken into account (Le Roy, 2004). Measuring competitive intensity is equivalent to determining the structural factors that determine its degree (Oster, 1990; Porter, 1982). In the same vein, O'Cass and Ngo (2007) and O'Cass and Weerawardena (2010) measure competitive intensity using the five sectorial forces defined by Porter (Porter, 1991).

In a more recent behaviourist approach, which is at odds with the static approach, the core of competitive intensity lies in the interactional "dynamics". In this approach, market concentration is considered as one of the antecedents of competitive intensity. With this concept, which places interactions between competitors at the centre of the debate, intensity is measured more in terms of its consequences, such as change in margin (change in the cost/price ratio) (Feinberg, 1985; Gimeno and Woo, 1996), the number of competitors entering or exiting from the market (Baum and Corn, 1996), 1999; Barnett, 1993), or the transfer of market share between competitors (Li and Calantone, 1998). Other authors measure the degree of competitive intensity by its impact on consumer behaviour. The competitive intensity between two brands can thus be measured by studying transfers (Carpenter and Lehman, 1985; Grover and Srinivasan, 1987), inter-purchase periods (Fraser and Bradford, 1983; Grover and Rao, 1988), simultaneous brand considerations (Chandon and Strazzieri, 1986), revealed preferences (Merunka and Le Roy, 1991) or even penetration and duplication indexes (Dawes and Nenycz-Thiel, 2013). These authors study competition at the individual level (Shocker et al., 1990) and are more interested in the underlying reasons for competition than competition itself (Merunkaet al., 1999). "These measures help to understand the similarities and differences between brands that may explain competitive intensity measured elsewhere" (p. 11). Another research group focuses on the dyadic of action and response (Chen et al., 1992; Chen, 1996, Chen and Miller, 2012) and measures the degree of competitive battle through direct observation of the competitors' actions and responses. However, these measures remain limited to two competitors. Finally, another group measures competitive intensity at the market level by including all competitors. Some measures used by this group provide no information concerning the instruments used (Bosoet al., 2012, Mahapatra et al., 2012; Muller, 2002). Competitive intensity is considered by Muller (2002), for example, to be "strong" when the respondent indicates a highly competitive market, and "weak" when the respondent indicates a "moderately competitive market" or a "weakly competitive market". Other measures focus on the instruments used by all competitors in a market, through the use of various scales (Chan et al., 2012; Chen et al., 2015; Cooper and Kleinschmidt, 1990; Cui et al., 2005; Gonzales-Benito et al., 2014; Jaworski and Kohli, 1993; Lee and O'Connor, 2003; Leonidouet al., 2013; Navarro-Garcia et al., 2015; Pulendranet al., 2000; Tsai and Hsu, 2014; Tsaur and Wang, 2011). However, we believe that these scales measure market dynamics only partially, because they do not take into account all the instruments used in the competitive battle, and do not distinguish between strategic and tactical instruments. Table 1 summarizes all of these scales.

Reference	Measure used	Aim of the research
Bosoet al. (2012)	One dimension (3 items): 1. Our export markets are known for competition between companies. 2. There is substantial competition between competitors in our export markets. 3. There is intense competition between competitors in our export markets.	To study the impact of entrepreneurship and market orientation on the success of a new export product, under different levels of competitive intensity and financial capital.
Chen (1996)	Respondents are asked to indicate, in order of importance, from a list of 13 competitors, the five airlines with which the most intense rivalry is experienced.	To study the impact of multi-market competition and strategic similarity, on rivalry between two competitors.
Chen et al. (2015)	One dimension (3 items): 1. Promotional warfare is intense in our industry. 2. Every time a competitor does something, the others quickly do the same. 3. In our industry, price is the main component of the competitive conflict.	To study the moderating role of competitive intensity and entrepreneurship between the capacity of technological information and the performance of product innovation.
Cooper and Kleinschmidt (1990)	One dimension (3 items): 1. Number of competitors. 2. The intensity of competition. 3. The degree of price competition.	To determine the success factors for new products.
Gonzales-Benito et al. (2014)	One dimension (4 items): 1. Our competitors are very aggressive in pricing decisions 2. Our competitors are constantly proposing new products or improved products for our target. 3. Our competitors propose products / services that can easily be substituted. 4. Our competitors are larger.	To study the moderating role of environmental characteristics in the market-orientation / performance relationship.

Jaworski and Kohli (1993)	One dimension (6 items): 1. Competition is fierce in our industry. 2. The promotional war is intense in our industry. 3. Every time a competitor does something, the others quickly do the same. 4. In our industry, price is the main component of the competitive conflict. 5. We often hear about a new competitive manoeuvre. 6. Our competitors are relatively slow.	To determine the antecedents and consequences of market orientation.
Lee and O'Connor (2003)	One dimension (5 items): 1. The number of competitors. 2. The intensity of price competition 3. Competitive intensity in the industry 4. The intensity of the main competitors' distribution system. 5. The intensity of the main competitors' advertising.	To study the moderating role of product novelty in the communication of new products.
Li and Calantone (1998)	One dimension (4 items): This product's market: 1. Is predictable / not predictable 2. Is not competitive / highly competitive 3. Market shares are stable / volatile 4. Has few / many new competitors	To study the impact of market knowledge skills on the advantage of new products.
Luschand Laczniak (1987)	One dimension (3 items): 1. Businesses will spend a higher proportion of each dollar on marketing, due to increased competition. 2. Companies in our industry will fight aggressively to maintain their market share. 3. Competition will be more intense.	To study the evolution of the concept of marketing, competitive intensity and organisational performance.
Molina-Castillo et al. (2011)	One dimension (3 items): 1. Competitive intensity on the market is intense. 2. Businesses will aggressively fight to maintain their market share. 3. Companies have increased their marketing expenses due to competitive pressures.	To study the impact of operating and skills exploration strategies on the performance of new products.

Muller (2002)	Only one item: Respondents are asked to indicate whether the market is very competitive, moderately competitive, or not very competitive. Competitive intensity is "strong" when the respondent indicates a highly competitive market, and "weak" when he/she indicates a "moderately competitive market" or an "uncompetitive market".	To study the influence of a competitive reaction on the performance of new products and the moderating role of market characteristics.
Pulendranet al. (2000)	One dimension (5 items): 1. Competition in our industry is fierce. 2. There is an intense promotional war in our industry. 3. Every time a competitor does something, the others quickly do the same. 4. In our industry, price is the main component of the competitive conflict. 5. We often hear about a new competitive manoeuvre.	To determine the antecedents and consequences of market orientation.
Song and Parry (1997)	One dimension (3 items): 1. Potential consumers of this product were very loyal to the products of competitors in this market. 2. There is a competitor who dominates the market (with a very high market share). 3. Potential consumers for this product were very satisfied with the competitors' products.	To determine the success factors for new products.
Tsai and Hsu (2014)	One dimension (3 items): 1. Promotional conflict is fierce in our industry. 2. Every time a competitor does something, the others quickly do the same. 3. We often hear about a new competitive manoeuvre.	To study the moderating variables between transverse collaboration in a business and the performance of new products.
Tsaur and Wang (2011)	One dimension (3 items): 1. The number of competitors in your category, within the alliance. 2. The extent of price competition in price competition, within the alliance. It should be noted however that this scale measures competitive intensity, using both structural variables, such as the number of competitors, as well as behavioural variables.	To study the role of reciprocity and competitive intensity in the relationship between personal characteristics and the performance of alliance strategies in Taiwan's travel industry.

Table 1: Scales for the measurement of competitive intensity in the literature

Despite the significance of this research, the measures generated by these studies nevertheless appear incomplete to us. Although the literature review suggests that competitive battle leads to two types of action, strategic and tactical, can the competitive intensity characterising this conflict have a two-dimensional structure? And if this were confirmed, how should it be measured? These are the questions we try to answer in the following section.

AProposal ForThe Measurement Of Competitive Intensity

The scale we propose is built on the basis of the Churchill paradigm (1979), updated by Gerbing and Anderson in 1988. We proceed in two steps: the first is the creation of a scale with the specification of the constructed domain and the creation of a sample of items; the second concerns its refinement and validation. Although the Churchill paradigm has been criticized (Rossiter, 2002), it is still relevant because it offers precise and simple rules for the construction of reliable measurement scales (Mansouri *et al.*, 2008). However, we have taken into account the remarks and developments formulated by Rossiter (2002, 2005), in an effort to improve this procedure, by systematically comparing each item with the definitions of the construct.

Specifications ForThe Domain Of The Construct

In this step, we follow Churchill's recommendations (1979) through a dual approach: theoretical, by studying the literature and researching existing measures, and empirical, by carrying out qualitative exploratory studies (individual or group interviews) with the dual objective of providing a definition of the construct to be measured, and identifying any internal dimensions of this construct.

In order to further develop the notion of competitive intensity and determine its internal structure, we base our approach on an exploratory qualitative study (Bardin, 1993, Wacheux, 1996). Our corpus is composed of texts corresponding to transcripts from a series of semi-directive interviews with 9 product managers. We interviewed product managers with market responsibilities in various sectors: telecommunications, information systems, public works, and ski equipment, in order to collect a variety of information (Table 2). Our corpus is homogeneous in terms of temporality, as the interviews were conducted over a two-month period.

Sector of activity	Company staff	Function
Energy management	5000 or more employees	Product manager
Energy management	5000 or more employees	Product manager
IT services	5000 or more employees	Product manager
Semi-conductors	1000 to 4999 employees	Product manager
IT services	200 to 499 employees	Product manager
Barcode traceability system	200 to 499 employees	Product manager
Ski equipment	0 to 49 employees	Product manager
Construction and public works	0 to 49 employees	Product manager
Construction and public works	0 to 49 employees	Product manager

Table 2: Sample from the qualitative study

The interview guide is structured around a central question: "How does competitive battle function in your market?" Follow-up actions made it possible to clarify the modalities of the battle. Interviews with product managers lasted one hour and a half, on average. Redundancy and crosschecking of responses during the last two interviews indicated a posteriori that there was thematic saturation at the end of the ninth interview (Allard-Poesi*et al*.,2004). After transcribing the interviews, manual thematic content analysis was carried out, firstly by dividing the corpus into recording units; these were grouped into categories to facilitate the development of our analysis grid. We then conducted a vertical analysis to study in depth each interview as well as a horizontal analysis to compare the different discourses. This technique is well suited to exploration in a poorly known field (Miles*et al*., 2014).
This content analysis made it possible to reveal the existence of two major themes. Regardless of their sector, the managers confirmed that competitive battle is indeed exerted at two different levels: strategic and tactical, with very different instruments for each level. Table 3 shows the main statements made during the interviews, for each theme.

Main responses to the question: "How does competitive battle function in your market?"

Theme 1 – The competitive battle in strategic terms

- *"we compete essentially in terms of new products"*
- *"the market we're in is a very competitive one. In this market all competitors are launching new products"*
- *"our competitors propose products that are very, very good and have technical capacity"*
- *"you can't always slash prices to gain market share. Many innovation programs have been developed in recent years, in an effort to improve the quality of our products. The competitive battle is being fought at this level"*

Theme 2 – The competitive battle in tactical terms

- *"it's a highly competitive market. We have to make promotional offers"*
- *"everyone is trying to be present in advertising campaigns, in magazines, websites, i.e. in marketing"*
- *"our competitors do not earn much with their products, rather with their after-sales services"*
- *"at every level: promotional offers, team management, in the shops, advertising is huge. The principle is to increase visibility, to maximize visibility in all communications media"*
- *"the competitive battle is exerted at the level of prices, speed of service, and quality"*
- *"indeed, we have products that are increasingly difficult to differentiate with respect to our competitors (because everyone is able to manufacture the same product), this is the reason for which we compete with prices, and with the offer of complementary services"*

Table 3: The main responses arising from individual interviews

The results derived from this qualitative exploratory analysis confirmed our belief that competitive intensity should be considered as two-dimensional. Measuring competitive intensity thus corresponds to measuring the intensity of the effort provided by competitors, in each of the two dimensions of this battle: strategic and tactical.

Creation OfThe Items Of The Competitive Intensity Scale

The items on our scale are based on the existing scales listed in Table 1 as well as the results of interviews with product managers. Indeed, although the existing scales are not perfectly adapted to our approach, some of their items are compatible. These items are presented in Table 4.

Items	Assigned dimension	Reference
publicity battle	*Tactical*	Lee and O'Connor (2003)
publicity battle at the level of sales promotion	*Tactical*	Jaworski and Kohli (1993); Pulendran, Speed, and Widing (2000)
publicity battle at the level of distribution	*Tactical*	Lee and O'Connor (2003)
price competition	*Tactical*	Jaworski and Kohli (1993); Lee and O'Connor (2003)

Table 4: Competitive intensity items found in the literature

The qualitative interviews allowed us to complete this list of items (Table 5). In the case of the items taken from Anglo-Saxon measures, these were translated from English into French, and then back translated, in order to check the quality of their translation. Then, for these items and for those taken from the exploratory interviews, content analysis was used to classify them into the different dimensions. Finally, a selection was made of the finally retained items, according to their dimension. Pre-testing of these items was done in two phases: 1) face-to-face interviews with three lecturers in management science, and face-to-face interviews with four managers. At the end of each phase, these items were modified while taking their comments into account. At the end of the second pre-test, and in the absence of additional remarks from the managers, the questionnaire was ready for release.

Items	Assigned dimension
Battle to improve the offer of complementary services	*Tactical*
Battle in terms of sales force	*Tactical*
Rhythm of the launch of new products	*Strategic*
Rate of product improvement	*Strategic*
Battle to improve the quality of products	*Strategic*
Battle to launch new products	*Strategic*

Table 5: Items of competitive intensity derived from the qualitative study

Table 6 presents the initial 10 items of the competitive intensity scale. These items describe the intensity and speed with which marketing instruments are used in competitive battle.

"You consider that: … "		
1. The rhythm of new products launched on the market was globally …	*Very fast* *Slow*	*Fast* *Very slow*
2. The rhythm of improvement to products on the market was globally …	*Very fast* *Slow*	*Fast* *Very slow*
3. The publicity battle was …	*Very intense* *Weak*	*Intense* *Inexistent*
4. The sales promotion battle was …	*Very intense* *Weak*	*Intense* *Inexistent*
5. The battle to improve the quality of products was …	*Very intense* *Weak*	*Intense* *Inexistent*
6. The battle to launch new products was …	*Very intense* *Weak*	*Intense* *Inexistent*
7. The battle in terms of distribution was …	*Very intense* *Weak*	*Intense* *Inexistent*
8. The price war was …	*Very intense* *Weak*	*Intense* *Inexistent*
9. The battle in terms of sales force (size, stimulation, canvassing, clients, …) was …	*Very intense* *Weak*	*Intense* *Inexistent*
10. The battle to improve the offer of complementary services was …	*Very intense* *Weak*	*Intense* *Inexistent*

Table 6: Initial items for the competitive intensity scale

In our approach, this scale includes two sub-dimensions: the actions related to the "strategic" dimension and the actions related to the "tactical" dimension. The former corresponds to items 1, 2, 5, 6 and 10, and the second to items 3, 4, 7, 8 and 9.

Data Collection

Three data collection methods were used: mailing, hand-delivery and online survey. Our target population included executives with a marketing function (i.e. product manager, marketing manager, sales manager, sales engineer).

In practice, 546 questionnaires were sent to managers working in the fields of electronics, the automotive industry and plastics. They were contacted in advance by telephone in order to increase their response rate (Yu and Cooper, 1983). Two weeks after the first contact, we again contacted the people concerned. Finally, 42 questionnaires were returned. At the same time, questionnaires were hand-delivered to members of the target group through trainees and apprentices from a business school. Out of 69 distributed questionnaires, 12 were returned. Finally, the questionnaire was placed online using the Sphinx software. On the basis of various diploma directories and files found on the Internet, 1745 persons were contacted. A total of 107 questionnaires were collected. Overall, these three procedures allowed us to collect 161 completed questionnaires. The use of three different data-collection methods made it possible to reduce the influence of the search method on the results obtained (Mitchell, 1985; Bagozzi and Yi, 1991; Williams and Brown, 1994). We eliminated 21 questionnaires, thus restricting our final data analysis to 140 questionnaires.

Refinement AndValidation Of The Scale

Testing of the structure of the two-dimensional scale of competitive intensity was carried out in two steps: an exploratory factorial analysis (EFA) first made it possible, thanks to the use of principal component analysis with Promax rotation, to refine the measure by successively eliminating all items that were not correctly assigned. Confirmatory factorial analysis (CFA) was then used to refine this structure. This second step was the object of a systematic bootstrap procedure, designed to minimize the risk arising from non-compliance with the multi-normality hypothesis.

Results

Table 7 shows the structure resulting from the exploratory factorial analysis.

	Tactical	**Strategic**
58. Publicity battle	*0.822*	
59. The battle in terms of sales force	*0.901*	
62. The battle in terms of distribution	*0.833*	
48. The rhythm of new products launched on the market was globally		*0.923*
49. The rhythm of improvement of products on the market was globally		*0.919*
61. The battle to launch new products was		*0.581*
% variance (before rotation)	*53*	*19.4*
% variance (after rotation)	*51.87*	*48.13*
Internal consistency (coefficient α)	*0.81*	*0.79*

Table 7: Structure derived from exploratory factorial analysis

The two updated factors effectively correspond to the two dimensions of the scale. However, it was necessary to delete some items in both dimensions. Thus, terms related to price and sales force have disappeared from the "tactical" dimension. At the same time, the items related to the intensity of the battle to improve the quality of products and services were eliminated. The internal coherence is very good in both dimensions (0.70 for the strategic dimension and 0.81 for the tactical dimension). Finally, as the correlation between these two dimensions is found to be 0.45, they are close, but not identical. This two-dimensional structure was thus subjected to confirmatory factor analysis, and the two-dimensional model developed from this analysis was specified. The coefficients used to fit the model to the data are listed in Table 8. As shown in the table, these indexes are sound and justify further analysis.

χ2 (ddl, p)	χ2/ddl	Γ (min – max)	Γ fitted (min – max)	RMSEA (min - max)
17.41 (8, 0.026)	2.18	0.979 (0.944 – 0.998)	0.946 (0.853 – 0.996)	0.09 (0.025 – 0.15)

Table 8: Fit indicesfor the structure of the competitive intensity scale

Table 9 shows the results of the structure obtained from the confirmatory analysis

	Tactical	**Strategic**
58. Publicity battle	*0.798*	
59. The battle in terms of sales force	*0.822*	
62. The battle in terms of distribution	*0.642*	
48. The rhythm of new products launched on the market was globally		*0.764*
49. The rhythm of improvement of products on the market was globally		*0.850*
61. The battle to launch new products was		*0.696*
Convergent validity (ρ_{vc})	*0.53*	*0.60*
Internal consistency (coefficient ρ)	*0.80*	*0.81*

Table 9: Structure derived from confirmatory factor analysis

The factorial structure obtained confirms the good quality of the measurement. The convergent validity of the "tactical" dimension is good (pvc=0.57). It should be noted, however, that item 62 has an insufficient factorial weight. It was nevertheless retained, because it provides dimension-specific information, and this does not prevent the attainment of a good convergent validity coefficient (Fornell and Larcker, 1981). The convergent validity of the "strategic" dimension is also good (pvc=0.60). The factorial weight of item 61 is only just acceptable. These two dimensions have good internal coherence: 0.80 for the "tactical" dimension and 0.81 for the "strategic" dimension.

Finally, the computed correlation is 0.53. This coefficient is high, and indicates a high level of multi-colinearity between the two dimensions, thus suggesting a continuum between tactical and strategic decisions.
From an initial set of 10 items, we retained only six. Table 10 lists the items that were discarded.

Battle to improve the quality of products
Battle to improve the offer of complementary services
Battle in terms of sales force
Price war

Table 10: Items eliminated from the initial competitive intensity scale

The discarded items can be regrouped into two subsets:
- The first two items correspond to the "strategic" dimensions of the competitive battle. These items focus on the intensity of the battle to improve the quality of products and services;
- The last two items correspond to the "tactical" dimension and focus on the intensity of the battle at the level of a firm's sales force and services.

Finally, the "strategic" dimension of competitive intensity captures the intensity of the battle to launch new products as well as the speed of product launch and development. The "tactical" dimension measures the intensity of the competitive battle in terms of advertising, promotion and distribution.

Discussion

Despite the frequent use and importance of competitive intensity, this concept is rarely studied as such. No studies have looked at its internal structure. The present research proposes a two-dimensional conception of competitive intensity that observes competitive actions in the market. This two-dimensional design resulted in a proposal to measure competitive intensity. Unlike previous scales that consider competitive intensity to be one-dimensional, and do not distinguish between strategic and tactical decisions, we propose a more complete measure of competitive intensity along these two dimensions.

Theoretical Implications

In theoretical terms, and in line with the dynamic perspective of competition, this two-dimensional conceptualization of competitive intensity helps to strengthen the concept of competitive intensity, and improve the understanding of how competitive battle is applied to the market. In terms of the two dimensions we have identified, some markets are exposed to what can be termed a fundamental battle between competitors, in which they try to dominate the others, using strategic instruments requiring considerable investments, such as innovation. In other markets, competitors defend their position through the use of tactical marketing instruments that have mainly short-terms effects. In still other markets, both instruments can be used.
This two-dimensional conceptualisation also seeks to assess the impact of the antecedents of competitive intensity. The antecedents of competitive intensity identified in the literature, such as strategic similarity, market concentration or

multi-market competition (Baum and Korn, 1996; Chen, 1996; Gimeno and Woo, 1996; Gimeno, 1999; Jayachandran *et* al., 1999; Peteraf, 1993; Ramaswamy *et al*., 1994) have a different influence, depending on the dimension of the competitive intensity (Bylykbashi*et al*., 2016). The strategic similarity between competitors thus has an influence on tactical actions only, and affects only the tactical dimension of the competitive intensity. On the other hand, it has no impact on the strategic dimension of the competitive intensity. This confirms the resource-advantage theory (Barney, 1991; Wernerfelt, 1984), according to which competition is a process of battle between competitors, whose objective is to achieve a comparative advantage in resources. This comparative advantage in resources then leads to a competitive advantage and to improved performance (Hunt and Morgan, 1995). Competitors with superior resources, skills and abilities can more easily develop new products, and maintain for a longer period of time the competitive advantage provided by these new products (Johnson *et al*., 2002). This two-dimensional view also provides a better understanding of the impact of competitive intensity on the products' launch strategy. Indeed, the two dimensions of competitive intensity have a distinctly different impact on launch strategy (Bylykbashi*et al*.; 2016).

Managerial Implications

At the managerial level, this allows managers to better understand the competitive environment, which can lead to more appropriate decisions. Any error in the assessment of the state of competitive intensity can result in a waste of resources. Competitor movements do indeed generate signals for managers (Chen *et al*., 1992, Smith and Grimm, 1991). The decision to react or not to a competitive event is based on the information available to the manager about the competitive environment, and how he or she will interpret it (Klemz and Gruca, 2001). By taking the duality within competitive intensity into account, managers can gain a better understanding of competitive battle and become more familiar with the instruments used, thus allowing them to improve operations and allocate their resources according to these two dimensions.

Limitations AndFuture Research

A first limitation is the conceptualization of the strategic dimension of competitive intensity. This dimension corresponds to an intense and fast-moving battle to launch new products on the market. However, new products vary depending on their degree of novelty. A new product can be either a real novelty (Hoeffler, 2003), or a simple extension of the product line. We have not distinguished between new products according to their degree of novelty. Further research could refine the strategic dimension of competitive intensity by distinguishing possible differences in degree of novelty.

Another limitation concerns the conceptualization of the tactical dimension, measured by the competitive conflict in terms of advertising, sales promotion and distribution. Nevertheless, in the case of some brands such as Dell or Amazon, distribution is at

the heart of their strategy.
In addition, for each variable in the mix, there are both strategic and tactical dimensions. Not only is it often difficult to separate them, but strategic and tactical decisions are also interdependent. Highly promoted premium brands can thus have high prices; similarly, medium-quality brands with strong advertising support can charge slightly more for their products (Faris and Rebstein, 1979); alternatively, the message in an advertising campaign can meet that of the sales team (Urban and Hauser, 1993).
Finally, while the consideration of (strategic and tactical) duality within the concept of competitive intensity appears to be relevant, the instruments included in each dimension may be different, depending on the type of market and product: B to B, B to C, sustainable or non-sustainable, technological or non-technological (Kotler, 2000). Other studies could analyse and determine the variables to be taken into account in each dimension.
One final limitation has to do with the validation process for the measurement scale. Although we have verified internal consistency, scale validation was performed with just one set of collected data. It is nevertheless recommended to separate these two procedures and to use two different samples for this purpose (Gerbing and Anderson, 198). It is also essential to assess the nomological validity and to retest this scale with a larger sample, since the indicators used in confirmatory analyses are sensitive to sample size (Hu and Bentler, 1998).

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