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Quantitative tool for market sector strategic analysis

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Abstract

Purpose – A competitive business strategy with a greater chance of success depends on an accurate quantitative analysis of business strategic factors prevailing in a company. The purpose of this paper is to conduct the latter to determine the level of competitiveness in a sector.
Design/methodology/approach – This study develops a tool based on literature classics and tested in the telecommunications industry to determine market segment competitiveness, market attractiveness and the relative ability of companies to generate profits.
Findings – The proposed tool allows managers to quantify each strategic factor and, thus, identify positive factors leading to a competitive advantage and weaknesses leading to vulnerability, which enables an improvement in daily strategic decision making.
Practical implications – Implementing the tool can enable managers to both quantify each strategic factor and improve strategic decision making.
Originality/value – This methodology employed here is novel. As such, this study provides new insights into how to compete in the telecommunications industry and discusses useful implications for academia, new entrepreneurs, buyers and suppliers.

Keywords Strategy, Strategic factors, Competitive positioning, Market attractiveness, Competition, Strategic analysis

Paper type Research paper

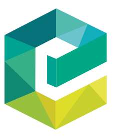
Introduction

Managers often define their market competition too narrowly, only taking into account direct competitors, as they often lack a more accurate holistic view (Singh *et al.*, 2008). In general, the competition for profit goes far beyond traditional opponents and, according to Porter (2009), there are five strategic factors that shape the nature of all competitive interactions: the threat of new entrants, power of customer trading, bargaining power of suppliers, threat of substitute products and rivalry among existing competitors. These external strategic factors determine the industry or market segment's competitive intensity, directly influence a market attractiveness and determine a firm's ability to generate profits (Lillis and Mike, 2013).

According to Kluyver and Pearce (2010), another six strategic factors should be evaluated in order to achieve more reliable results: international competition, current and potential customers in relation to market share, market positioning, concentration of activities, adoption of corporate strategies in the management of the supply chain and technological innovations, and factors that do not depend on the market such as social, political and legal arrangements.

Other strategic factors have also been emphasized in the literature. This study focuses on the business environment, business organization and management (Wang and Chang, 2008; Lee *et al.*, 2012), business manager leadership (Wang and Chang, 2008), the development of the technological innovation of products and processes (Camisón and Villar-Lopes, 2014), competitive positioning (Hooley *et al.*, 2011) and the management of the supply chain (Samuel *et al.*, 2011).

The management of such strategic forces directly relates to business performance; thus, thinking in terms of strategic factors, such as internal power, external power, bargaining power, competitor rivalry, rivalry of substitute products, competitive positioning, management of the supply chain and technological innovation, is essential (Kluyver and Pearce, 2010).



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A structured methodology, based on the analysis of broad strategic factors, is needed (Singh *et al.*, 2008). Any change in the competitive strategic forces identified through market analysis requires the reassessment of the entire business (Zaccarelli, 2012). In this context, a quantitative framework may help identify the primary strategic factors for management (Morgan, 2012).

According to Singh *et al.* (2008), there are not enough holistic approaches to analyze a business sector and enable a strategic assessment to guarantee continuous improvement. Additionally, managers face a lack of quantitative methods to measure the competition factors that can affect their strategic evaluation in a positive or critical manner.

This study attempts to fill this gap. The objective of this study is to provide a quantitative methodology to analyze the common strategic factors in business today and use this assessment to determine the level of industry competitiveness and attractiveness.

We use a reference guide for the "quality of the methodology of a business" as stated by Zaccarelli (2012, p. 101). This method relies on the ordering of the competitive forces discussed by Porter (2009) with a quantitative and representative analysis of the particularities of a given time, using a grade from 1, for very easy, to 5, for very difficult.

Four strategic factors presented by Kluyver and Pearce (2010) as essential to the effective development of industry analysis are also included in the model: international competition, market positioning, adoption of corporate strategies in the supply chain and technological innovations.

Methodology

To meet its general and specific objectives, this study relied on a literature review and exploratory field research.

One of the aims of this study is to emphasize the analysis of the current competition strategies and develop a methodology to quantify the classics strategies. To this end, the bibliographic research is an essential tool.

This research aimed to improve and advance knowledge and create an analysis model of competitive strategies. A preliminary quantitative method was developed to identify each strategic factor. The investigation will result in a final quantitative table of a business in the target sector.

Zaccarelli's (2012) "methodology for evaluating the quality of a sector," based on the competitive forces described by Porter (2009), also proposes a methodology to quantitatively assess strategic factors. However, Kluyver and Pearce (2010) emphasize the need to analyze more strategic factors, such as the international competition and demographics, current and potential customers, positioning, corporate strategies in supply chain management and the effective development of industry analysis.

The target of the field research is the telecommunications industry in Brazil, specifically, the largest companies in the sector: Vivo, Oi, Embratel, Claro and Ericsson.

This sector is very competitive and is characterized by significant economic and financial movement. Currently, the five largest companies in the sector are Vivo, Oi, TIM, Claro, Embratel and Brasil Telecom, which account for 98 percent of the market and compete strategically for the fast-growing mobile phone and internet segment, while the market for fixed telephony has significantly shrunk (Agostini, 2011).

From the year 2000 onwards, the telecommunications sector has attracted hundreds of billions of investment in Reais to improve coverage and reduce costs (Costa, 2009).

We collected information on this sector through a survey on a total of eight respondents, who occupy the following positions:

- two executive managers of corporate business (Oi);
- a commercial director (Oi);

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- a regional business director (Vivo);
- a regional business manager (Vivo);
- a corporate business manager (Embratel);
- a business manager (Claro); and
- an operations manager (Ericsson Telecommunications).

The data collection survey was developed to identify the most important strategic factors discussed in the literature. This included a questionnaire, comprising 19 questions and personal interviews. The questionnaires were sent and interviews conducted via the internet and involved open and closed questions.

Literature review

Competitive strategy concepts

Since 1980, "strategy" has become an independent academic discipline, which includes a vast and exponentially growing amount of literature. In general, many consider the mid-1960s as the beginning of this research stream, but research on military strategy began much earlier. Sun Tzu wrote *The Art of War* in the fourth century B.C. (Mintzberg *et al.*, 2010). However, this field has significantly evolved over the past five decades (Zaccarelli, 2012).

The evolution of organizational strategies has been significantly influenced by the works of Michael Porter, elaborated in three movements. The first is the theory of "strategic positioning," introduced by the publication of Competitive Strategic in 1980, with its famous model of competitive forces inspired by the industrial economy and immediately assimilated by the so-called "conception" and "planning" schools. The second is the publication of Competitive Advantage in 1985, which introduces one of the main pillars of Porterism, the notion of an "integrated value chain." The third movement refers to the publication of Competitive Advantage of Nations, in 1990, which is a generalization of the fundamental works on national development policies (Aktouf *et al.*, 2005).

Nurturing sound management practices based on strategic thinking is necessary for leading companies to avoid market retraction and sustain growth. A competitive strategy implies a plan to compete differently with the aim of winning market share. To this end, the resolution of a firm's strategic problems is combined with a creative process to find better ways to compete (Rajasekar and Raee, 2013).

To be competitive, companies need to establish strategies for local, regional and global markets. The larger the geographic range, the greater the need for competitive abilities (Martins and Laugeni, 2015) to address the dynamics of strategic maneuvering among competitors. A better competitive ability can be achieved through higher financial reserves as well as the creation of alliances to generate even more reserves, thereby increasing the firm's power of intervention, market management, decision making and action (Kluyver and Pearce, 2010). Within a market, the frequency, boldness and aggressiveness of strategic moves can accelerate the conditions for imbalance and constant change (D'Aveni *et al.*, 2010).

To understand competitive strategy concepts, it is essential to describe strategic management as "the process of organizational transformation toward the future, led and executed by the highest summit of the organization, with the involvement of management and employees in general" (Costa, 2009, p. 56).

Analysis of sector development strategies

Each organization should consider other businesses and that it is not perceived as exclusive by its customers; therefore, the strategic analysis of its market sector is crucial. A pioneer company may face an initial period of tranquility, with few competitors, but this period is

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generally short-lived. Many imitators will soon enter the market, especially if the business pioneer is successful. Thus, as competitors create movement in the market, although they may not threaten the pioneer's secure position, they may cause the development of new strategies (Costa, 2009).

To better understand a competitive industry, an important aspect of the analysis is to define with precision the boundaries of each competitor. These limits or boundaries relate to two dimensions: the first is the scope of the good or service; the second is the geographic radius of action. According to Rajasekar and Raee (2013), the definition of the limits of each competitor in the industry has a direct impact on the strategic analysis and underpins business strategies.

According to Ferrell (2009), a firm's strategy is its competitive plan to achieve the desired success, and Kluyver and Pearce (2010) see the pursuit of a competitive advantage as the positioning of the organization. The definition of a positioning strategy is related to a firm's competition level. Moreover, organizational success is fully connected to a firm's competitive advantage (Hooley *et al.*, 2011).

Ferrell (2009) also states that a company's competitive advantage is what it has to offer in relation to other competitors; in other words, offerings that provide advantages to clients and satisfaction to shareholders. The pursuit of a competitive advantage must necessarily be based on the analysis of the industry as part of the development of a firm's primary and secondary strategies.

Firms' strengths and weaknesses significantly change over time, especially in increasingly competitive market sectors, and this may compromise a firm's competitive advantage (Sirmon *et al.*, 2010). Each firm needs to investigate its competitors (Kotler and Armstrong, 2011) and continuously compare products and marketing strategies, analyzing any potential benefits and/or competitive disadvantages.

The logical process of a strategic analysis should address the composition of market structure, market conduct and market performance. The analysis should also address the conditions in which companies must adjust their strategies to the environment to achieve superior performance (Han *et al.*, 2012).

Porter's five forces model

Figure 1 shows the five strategic competitive forces introduced by Porter (2009). According to his analysis, no matter how different the sectors are, the underlying drivers of profitability are identical. To understand the competitiveness and profits of an industry, it is necessary to analyze its basic structure in terms of the five forces: the threats of new entrants, the bargaining power of customers, the bargaining power of suppliers, the threat of substitute products or services and the intensity of the rivalry among existing competitors.

The forces that exist in the competitive environment act to continuously reduce or increase the rate of return on invested capital (Cecconello and Ajzental, 2008). Porter's model captures the business perceptions of the competitive factors that create pressures on prices, costs, investment rates and other mandatory strategies necessary to compete in a given sector (Rajasekar and Raee, 2013).

The threat of new entrants in the market. According to Degen (2009), all apparently successful businesses attract new competitors; if there are no barriers to entry, businesses tend to lose profitability due to an increasing number of competitors. The lower the financial barriers to entering the market, the easier the entry of new competitors due to the little investment needed (Porter, 2009).

There are many examples of large organizations entering certain market sectors and thereby creating a revolution in the competitive play, while leaving existing competitors in difficult positions. Michael (2011) describes the case of Apple and its sudden turnaround in the 1990s after the return of Steve Jobs. To achieve this, the company implemented a

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Figure 1.
Porter's five forces

Source: Adapted from Porter (2009)

new strategic management model focused on research and technology. These changes confirmed that a strategy of innovation and creativity are essential factors for organizational success. At the same time, the strategic actions of large organizations have often created real havoc, causing losses and even bankruptcy among the existing market players that were not prepared to withstand competition from a new entrant in the business (Kluyver and Pearce, 2010). History dictates that the only way to be prepared to increased completion is by being aware of all potential market threats and developing the ability and willingness to change.

When markets do not serve customers adequately, opportunities for new entrants increase. Competitors may use a deficiency in the market, left open by current participants, to their own advantage. As the number of market participants increases, the resulting growth of organizational complexity has a negative impact on organizational performance (Caldart and Oliveira, 2010).

Consumer bargaining power. Strategic negotiation skills are increasingly indispensable in the business world. Bargaining power represents the position of the negotiator in regards to the relative ability to influence the outcome (Thompson, 2009). According to Porter's second force, consumers can have more concentration in the negotiation, a different purchase option, and look for lower costs to switch suppliers.

Customers with bargaining power influence the level of business competitiveness. Customers tend to have more negotiation power in markets where there is little or no differentiation among vendors, clients are powerful in financial terms and in hold a stronger negotiating position than sellers, and many sellers are available to serve customers (Hooley *et al.*, 2011).

Suppliers' bargaining power. The bargaining power of suppliers can directly influence the competitiveness of a market, and powerful suppliers may charge more or less based on their current strategic intention (Briggs and Shore, 2007). The level of competition among

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suppliers also disrupts the business relationship between the customer and the supplier. When an industry is characterized by a low level of competition, suppliers tend to have greater bargaining power over customers (Han *et al.*, 2012). The strategic customers of powerful suppliers will have better options, and the weaker and less strategic customers will face higher prices. Suppliers transfer their costs and charge higher prices to the most vulnerable clients in the market (Porter, 2009).

Threat of substitute products and/or services. A competitive product can replace primary industry products directly or by offering the same value to the customer under better buying conditions (Cecconello and Ajzental, 2008). The competitive intensity among companies may increase if either the new entrants make use of already existing technology (copycats) or they improve on existing products in the market (innovations) (Hooley *et al.*, 2011).

When the threat of substitution is high, the profitability of the market sector suffers, and limitations to the sector's profit potential unfold as the increased competition causes greater pressure on prices (Porter, 2009).

Rivalry among current competitors. Porter's fifth force involves an industry's competitors' efforts to sustain and improve market share, profitability and image. Intense rivalry limits the profitability of the industry as a whole (Rajasekar and Raee, 2013).

In such a situation, organizations facing intense competition will be unable to compete effectively or survive in the market if they do not develop strategies to reduce costs. The real challenge implementing a low-cost strategy without affecting quality (Elgazzar *et al.*, 2012).

When the competition among existing vendors is balanced in terms of size and/or market share, the competition level is more intense (Hooley *et al.*, 2011). Economic conditions can also have a profound impact on strategy; for example, a generally low economic growth may induce the growth of one competitor at the expenses of another (Ferrell, 2009).

Kluyver and Pearce strategic factors

International competition. In today's world, fierce global competition is forcing companies to rethink their strategies; for example, it may be more strategic for a firm to manufacture a certain product nationally rather than import it or vice versa (Martins and Laugeni, 2015). Thus, these strategies will encompass the many reasons companies may market their products abroad, including: to pursue new growth opportunities; to obtain higher profit margins; to acquire new ideas about products, services, and ways of working; to generate better ways of serving strategic customers; to stay close to sources of supply; to obtain production information; to develop economies of scale in supplies, production, and marketing; to test them against international competition; and to invest in alliances (Cavusgil *et al.*, 2010).

Virtually all companies today are affected by market globalization. The maturity of many Western markets has, in some cases, forced the expansion of businesses seeking to recover their lost market share (Cavusgil *et al.*, 2010). In a global economy, companies in a given sector can become more competitive and productive through the implementation of strategies that include sophisticated investment in modern technologies (Greckhamer, 2010).

Market positioning: product placement as a strategic factor. The success of a company is directly related to its ability to meet and even exceed customer expectations for its products or services. However, customers' needs are different, and companies need to fulfill these needs, stressing the importance of considering the best strategic positioning to achieve the desired performance (Martins and Laugeni, 2015).

In terms of choosing the right market segment, deciding how to create differentiated value for the segment, and defining a competitive position, the strategic positioning of the product, the brand and/or the company are all essential factors. The subjective value of the product or service is what occupies consumers' minds (Kotler and Armstrong, 2011).

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Supply chain management as a strategic factor. Intense competition in global markets, coupled with the growth of products and services with short life cycles and higher customer expectations, force firms in the production sector to invest more and focus on managing their supply chains more effectively. Improved supply chain management through new strategies can reduce costs and improve service levels tied to organizational goals (Simchi-levi *et al.*, 2010).

Several companies have managed to successfully develop a competitive advantage and/or correct a disadvantageous situation through the strategic management of their supply chain (Barnes and Liao, 2012). Supply chain management seems to be the new frontier of business development (Simchi-levi *et al.*, 2010).

Technological innovation management as a strategic factor. Technology management has attracted an increasing amount of attention from academia and industry and has become a self-sustaining discipline (Cetindamara *et al.*, 2009).

The management of technological innovation represents the company's oversight of its activities to selecting, developing and marketing new products in line with its organizational strategy. This may allow the company to be more competitive and achieve profitable growth in the long term (Linda *et al.*, 2011). Scholars focusing on innovation, such as Hitt *et al.* (2001), Hoskisson *et al.* (1999) and Priem *et al.* (2012), have debated whether technological innovations are driven by the technological advances themselves or rather by the strategies to differentiate a business from competitors and improve market demand.

Di Stefano *et al.* (2012) highlight the importance of entrepreneurship in the management of technological innovation and note that innovation and entrepreneurship are often developed in different fields. However, entrepreneurship and innovation are also closely linked. The process of creating new products, the production processes, the markets and strategic forms of organization are all primarily based on entrepreneurship. However, the very definition of entrepreneurship incorporates the idea of exploring opportunities in the environment through technological innovations to create wealth (Rozenfeld *et al.*, 2011). Organizations innovate in different ways, with new product design, production process updates and new ways of thinking about market management. Technological innovation also results from research (Cavusgil *et al.*, 2010).

New technology is the primary determinant of increased productivity today, directly affecting the growth rate of the economy. It also represents one of the biggest determinants of innovation and change in a market situation. Moreover, it may give a company a competitive advantage and become an indispensable condition for the survival of the company (Linda *et al.*, 2011).

In the competitive management of organizations, product development is increasingly considered to be a critical strategic factor due to the increasing internationalization of markets, increasing diversity and variety of products, and the reliance of profit margins on product life cycles (Rozenfeld *et al.*, 2011).

Through continuous technological advances, the possibility of entering a market early and achieving better results increases. Therefore, it is more important than ever before that the entire organizational structure supports market surveys, research and product development, with laboratories and pilot tests, willing to take risks. Typically, companies that work with organizational structures focused on new products have high sales goals (Costa, 2009).

The effective selection of new technology has a necessary condition, the proximity to the customer. Managers should know their customers and understand their needs and requirements very well. The technological strength of a company in the market at any given point in time will be larger than that of competitors if the company has protected its technological leadership in this way (Hooley *et al.*, 2011).

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Research shows that, when managing technological innovations, companies intensify alliances to access, acquire and leverage innovative project resources, where they can combine the use of resources and spread risks in substantial investments (Gnyawali and Park, 2011). A company faces three major challenges when considering technological innovation: the shortening life cycle of products due to rapid technological advancement and rapid change in consumer preferences; the convergence of various technologies; and the exponential growth in research and development (Gnyawali and Park, 2011).

Methodology to quantify strategic factors

In this section, we describe the methods used to create the final assessment of the level of competitiveness, attractiveness and relative ability to generate income in a particular industry segment.

Summary of the key competitive strategic factors

After examining the classical authors' works on strategy, and to facilitate the understanding of the literature review, Table I summarizes these elements in terms of prevailing strategy, main subject and year of publication.

Method for the preliminary measurement of each strategic factor

The preliminary quantification analysis method for each strategic factor is meant to yield greater accuracy in evaluating each competitive factor. The items in Tables II–XI represent each strategic factor discussed and are graded in a range from 1 to 5. These items evaluate various aspects of each factor and determine the final calculation of its median value.

Strategies	Authors	Main themes	Year
1. Power of new entrants	Porter	The higher the barrier to entry in a business, the less the competition	2009
2. Power to sell the business	Zaccarelli	The ease of selling a business indicates that the business potential is solid, and people want to enter the business	2012
3. Supplier bargaining power	Porter	The higher the supplier power, the smaller the number of exceptional conditions for the purchasing company	2009
4. Customer bargaining power	Zaccarelli	The better the customer negotiation power, the worse the vendor position	2012
5. Rivalry of identical products	Porter	The greater the number of identical products competing in the same market, the greater the competition intensity	2009
6. Rivalry of substitute products	Porter	The greater the number of substitute products, the greater the competition intensity	2009
7. Rivalry of international products	D'Aveni	The greater the international competition, the greater the market competition intensity	2010
8. Market positioning	Mintzberg *et al.*; Hooley *et al.*	The better the positioning of a firm's product, the less competition that product faces	2010 2011
9. Supply chain management	Bowersox *et al.*; Samuel *et al.*	The better the supply chain management strategy, the better the firm's competitiveness	2007 2011
10. Technological innovation	D'Aveni *et al.*	The higher the technological innovation capacity, the better the firm's profitability	2010

Table I. Main strategic factors

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Table II. Quantification of the entrance barrier factor

General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Investment	Porter (2009)	The higher the investment, the greater the difficulty for new competitors to enter, and, thus, the higher the score	
2. Strong brand	Zaccarelli (2012)	The ease of establishing a renowned brand facilitates entry into the market. The easier to establish a brand, the lower the score	
3. Bureaucratic standards for entry	Zaccarelli (2012)	The lighter the bureaucracy, the easier the entry of new competitors. The more bureaucratic it is, the higher the score	
4. Supplier change	Porter (2009)	The easier to change suppliers, the lower the score	
5. Specific environment	Zaccarelli (2012)	The more peculiar the environment, the more difficult it is to enter the business, and, thus, the higher the score. Example: entry in a high-tech industry is difficult, so there are fewer competitors	

Table III. Quantification of the exit barrier factor

General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Number of competitors	Porter (2009)	A higher number of competitors in a market sector may hinder its market potential and, thus, negatively influence the sales of a company. The lower the competition in the segment, the higher the score	
2. Investment recovery timeline	Zaccarelli (2012)	The longer it takes to recover investment in the company, the harder it is to sell or close up operations. The faster it is to recover company investments, the higher the score	
3. Financial difficulty in closing operations	Zaccarelli (2012)	The smaller the difficulty in assuming the costs to close the business, the higher the score	
4. Legal and social restrictions to close the company	Zaccarelli (2012)	The fewer the restrictions, the higher the score	
5. Business owner personal response	Zaccarelli (2012)	The greater the emotional constraints, the higher the score	

A grade of one means that the strategic factor has little intensity or even a possible strategic vulnerability for the business and a grade of five means that it represents the highest strategic factor intensity for the business; a factor that presents neither a competitive advantage nor disadvantage receives a grade of three.

The preliminary tool helps strategic managers identify the quantitative composition of each strategic factor; the values found depend on field research and are transferred to the final assessment table, which quantitatively determines the level of competitiveness, attractiveness, and, hence, the relative ability of the business to generate profits in a particular industry. The quantitative results of each factor support the analysis of the relevance of the factors and their weights.

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General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Large number of competitors in the same position	Hooley *et al.* (2011)	The higher the number of competitors in the same market share position, the lower the score	
2. Best current position in relation to competitors	Hooley *et al.* (2011)	The better the firm's position in relation to competitors, the higher the score	
3. High potential to advance its positioning	Hooley *et al.* (2011)	The better the ability of the firm to improve its competitive positioning, the higher the score	
4. Low number of competitors	Hooley *et al.* (2011)	The smaller the number of competitors in the same position, the higher the profit margins and, thus, the higher the score	
5. Growing market	Hooley *et al.* (2011)	The higher the growth in the market, the more opportunities for market positioning and, thus, the higher the score	
6. Protected technological leadership	Hooley *et al.* (2011)	The more protected the firm's technology is (e.g. patents), the higher the score	

Table IV. Quantification of the market positioning factor

General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Customer choice options	Zaccarelli (2012)	The fewer the vendors, the lower the customer power in vendor negotiations and the fewer the customer choices. The lower the number of customer choices, the higher the score	
2. Short product/sales life-cycles	Zaccarelli (2009)	Companies with products with short sales- or life-cycles have to negotiate quickly, which constrains the business. If the company is in the position of having to negotiate quickly, the score is lower	
3. Weak customer buying power	Porter (2009)	If the customer's power is weak in relation to the selling company because the customer buys too little and has no leverage to influence the exchange, the score is higher	
4. Strong competitors enabling customer bluffing	Porter (2009)	Strong competition in the market can facilitate customers' abilities to bluff in negotiations. The higher the probability of bluffing, the lower the score	
5. Costs of renegotiation	Zaccarelli (2012)	The higher the costs of renegotiating with the customer, the more expense for the business and, thus, the lower the score	

Table V. Quantification of the customer bargaining power factor

Table II summarizes the entry barriers as obstacles that entrepreneurs encounter in entering a certain business. The lower the difficulty of entering a particular business, the higher the level of competition, which reduces the attractiveness of the business (Porter, 2009).

Table III describes the exit barriers for entrepreneurs trying to sell their company and/or wind down activities. It is harder to sell a company in an industry with high competition, which makes the industry less attractive. Industries with lower competitiveness are generally more attractive because it is easier to sell a company (Porter, 2009).

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Table VI.
Quantification of the rivalry factor

General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Competition balance	Zaccarelli (2012)	The more balanced the competitors, the greater the competitive intensity, and the less attractive the industry segment. The more balanced the competition, the lower the score Observation: this may not be the case when the industry is an oligopoly or there is constant market growth, which enables all balanced competitors to grow. If so, disregard the question	
2. Stagnant market	Hooley *et al.* (2011)	Stagnant markets or slow growth tend to decrease competition. The higher the stagnation or the slower the growth, the lower the score	
3. Fixed costs	Zaccarelli (2012)	Higher fixed costs in relation to net income are a sign of increased competition in the sector. The higher the costs in relation to profits, the lower the score	
4. Differentiation	Zaccarelli (2012)	Little differentiation between competitors increases competition. The smaller the differentiation, the lower the score	
5. Idle company capacity	Hooley *et al.* (2011)	If the idle capacity of a business is large in relation to demand, the greater the pursuit of customers, and consequently, the greater the competition. The higher the idleness, the lower the score	

Table VII.
Quantification of the international rivalry factor

General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Natural and technological resources	Hooley *et al.* (2010)	Natural resources and technological advances are determinants of product development. If these features and enhancements are unique, the score is higher	
2. Delivery time	Hooley *et al.* (2010)	The longer the delivery times of rival international products, the higher the score	
3. Representatives and channel relationships	Cavusgil *et al.* (2010)	Success in international transactions depends on strong relationships with distribution channels and sales representatives. The better the relationships, the higher the score	
4. Number of competitors	Hooley *et al.* (2011)	The higher the number of international rivals competing with national companies, the more complicated it is to achieve goals. The greater the number of international competing products, the lower the score	
5. Tax regulations	Cavusgil *et al.* (2010)	Local tax regulations are factors that hinder negotiations and impact costs. The harder the tax regulations of the industry, the lower the score	
6. Guarantees	Cavusgil *et al.* (2010)	The greater the supply guarantees and development of rival international products, the lower the score	

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General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Many suppliers and few buyers	Zaccarelli (2012)	If many vendors offer similar conditions to a small number of competing buyers, the score is higher	
2. Supplier payment terms	Zaccarelli (2012)	If the supplier payment terms are short and it is hard to close a deal, the company negotiation power is low. The lower the company power, the lower the score	
3. Supplier delivery time	Zaccarelli (2012)	If the supplier sells to the company's rivals and has short delivery terms, the score is lower	
4. Company's power	Porter (2009)	If the company's purchasing power is large in relation to the supplier, the company is in a better leverage position. If the company power is high, the score is higher	
5. Negotiation costs	Porter (2009)	The higher the transaction costs in negotiations, the greater the cost to gain an advantage over suppliers. The greater the costs, the lower the score	
6. Partnership with suppliers	Kluyver and Pearce (2010)	If the company has privileged partnerships with strategic suppliers that are better than those of the competitors, the company is in a better position. The larger the company privileges in partnerships with its strategic suppliers, the higher the score	
7. Negotiation bluffing	Zaccarelli (2012)	If the company is more able to bluff in supplier negotiations, the score is higher	

Table VIII. Quantification of the supplier bargaining power factor

General description	Author and year	Detailed description of linkages to strategic factor	Quantification (1–5)
1. Stock costs	Calixto *et al.* (2011)	The lower the stock costs compared to competitors, the better the contribution margin. The lower the costs of stock, the higher the score	
2. Delivery time of suppliers	Kluyver and Pearce (2010)	The shorter the supplier delivery times, and in the exact amount needed by the company in relation to its competitors, the higher the score	
3. Transportation costs	Calixto *et al.* (2011)	Transportation costs can represent a competitive edge over competitors. The lower the transportation costs, the higher the score	
4. Transportation management	Calixto *et al.* (2011)	The efficiency in transportation management in relation to competitors often guarantees a competitive edge. The higher the efficiency, the higher the score	
5. Customer satisfaction	Hooley *et al.* (2011)	Customer satisfaction *vis-à-vis* the competitors represents a competitive advantage. The higher the customer satisfaction, the higher the score	

Table IX. Quantification of the supply chain management factor

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General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Time to development	Cetindamara *et al.* (2009)	The time for development and commercialization of the new product is shorter than that of competitors. The shorter the time, the higher the score	
2. Launch frequency of new products	Hooley *et al.* (2011)	The continuous launch of new products may create and maintain a market leadership position. The higher the frequency, the higher the score	
3. Innovations costs	Hooley *et al.* (2011)	Lower innovations costs compared to competitors may offer a competitive advantage. The lower the costs, the higher the score. Note: you can disregard this item in absence of this information; the information is hard to obtain, but needs to be evaluated	
4. Risk	Hooley *et al.* (2011)	The risk of the business grows with lower management capability. The lower the risk, the higher the score	
5. Innovation programs	Hooley *et al.* (2011)	Programs for development and innovation are planned and supported by top management over time. The better this structure in relation to competitors, the higher the score	
6. Market development	Kotler and Armstrong (2011)	If the company is able to meet market needs better than the competitors, the score is higher	
7. Relationship between strategy and engineering	Cetindamara *et al.* (2009)	If there is a strong organizational relationship between engineering innovation and company strategic management, the score is higher	

Table X. Quantification of the technological innovation factor

General description	Author and year	Link to strategic factor	Quantification (1–5)
1. Price	Porter (2009)	If the price of a replacement product offered by a rival is more appealing than the firm's main product, the firm's market share is negatively impacted. The more attractive the price of the replacement product, the lower the score	
2. Benefits	Zaccarelli (2012)	If the benefits of a substitute product offered by the competitors are more attractive, the firm will lose market share. The better the benefits of a substitute product, the lower the score	
3. Customer acceptance	Zaccarelli (2012)	The higher the customer acceptance of the switching costs to work with a substitute product, the higher the disadvantage for the firm. The higher the acceptance, the lower the score	
4. Reliability	Zaccarelli (2012)	The higher the reliability of the replacement product's functionality, the lower the score	
5. Customer satisfaction	Porter (2009)	The lower the customer satisfaction with the substitute product, the higher the score	

Table XI. Quantification of the product substitute factor

In Table IV, strategic market positioning refers to customer perceptions of the company and product position (Hassan and Craft, 2012). A better position creates a higher score, while a worse position or a higher difficulty in repositioning will result in a lower score.

Table V reports the measures of customer purchasing power vs those of the company. Customers with higher bargaining power can improve their price and conditions of purchase.

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In this case, the company is only in the position to accept, as the customer may very easily change providers. The lower the customer bargaining power, the lower the level of competitiveness, and, thus, the more attractive the business (Porter, 2009).

Table VI focuses on measuring the competition between companies in the market. The lower the competition, the higher the business attractiveness (Zaccarelli, 2009).

Table VII summarizes the items to measure competition between companies in the market at the international level. A lower competitive level will make the business more attractive (Porter, 2009). The lower the competitiveness of international products, the higher the final score.

The strategic factor in Table VIII is directly related to the power of suppliers. A vendor with a significant negotiation power tends to sell at higher prices and without special conditions, especially when negotiating with buyers who buy little, have little bargaining power, and, in this scenario, have serious strategic problems (Porter, 2009). The lower the bargaining power of suppliers, the higher the final value.

The items in Table IX report the management's organizational power in the supply chain in relation to competitors. A higher level of this factor will yield to a higher final value.

Table X reports items specific to sectors such as telecommunications, automotive and home appliances, which depend significantly on technological innovations and constant technological advances. Firms must understand their position in relation to competitors because companies that take longer to promote innovation will face greater competitive pressures (D'Aveni *et al.*, 2010). The higher the organizational power in the factor of technological innovation in relation to its competitors, the higher the final score.

The measurements reported in Table XI relate to the availability of substitute products that compete in the market. The greater the number of replacement products, the higher the level of competition, and, thus, the lower the business attractiveness (Porter, 2009). Fewer competing substitute products will result in a lower final score.

Quantitative analysis to determine competitiveness level, industry attractiveness and ability to generate profits

This section discusses the final findings from the preliminary framework for each factor reported in Table XII. It assesses the sector's competitiveness level for each strategic factor.

It is possible to transfer the primary table values for the final proposal using (X) or (N°) to the next column that represents the intensity of the competitive advantage of a strategic factor.

The final evaluations in Table XII use a scale ranging from 1 to 5, where one represents lower attractiveness and five represents higher attractiveness for any strategic factor. A score of three indicates an organization whose competitiveness and attractiveness is neither benefited nor harmed by a factor.

The criterion for the Lighthouse or Board panel (as in Table I) uses green, yellowand red indicators to create attention (Kaplan and Norton, 2006).

The Lighthouse criteria apply only after obtaining the results for each strategic factor. The last column reports the headlight color to improve readability.

These data also provide information on the scores to set the competitive attractiveness level of each factor and the relative ability to generate profits. The control board factors flagged in red in Table XII should be seen as vulnerabilities of a business.

Results and discussion

This section describes the results of the field research conducted on strategic managers of the major Brazilian telecommunications companies.

The subjects of the survey are the largest companies in the sector: Vivo, Oi, Embratel, Claro and Ericsson.

There were a total of eight respondents, seven males and one female.

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N	Strategic factors Types:	More attractive 5	4	Average 3	Less attractive 2	1	Attention Factors Competitive advantage	Control Board Criteria:
1	Entry barriers							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙
2	Exit barriers							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙
3	Market positioning							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙
4	Customer Purchasing power							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙
5	Rivalry national products							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙
6	International product rivalry							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙
7	Supplier Power							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙
8	Management of supply chain							4 and 5..... ( ) ⊙
								3 .... ( ) ⊙
								1 and 2 .... ( ) ⊙

(*continued*)

Table XII.
Determination of competitiveness level, attractiveness, and profit generation

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9	Technological innovation	4 and 5..... ( ) O 3 .... ( ) O 1 and 2 .... ( ) O
10	Substitute product	4 and 5..... ( ) O 3 .... ( ) O 1 and 2 .... ( ) O

Result of total points:	Free space below for observations about the business particularities:
Total Points:	....
– Great attractiveness: 42–50 points.	....
– Good attractiveness: 34–41 points	....
– Median: 26 to 33 points	....
– Regular Attractiveness: 18–25 points	....
– Little attractiveness: 10–17 points	....
Mark with an X according to total points above:	....
	....
– Great attractiveness: ....( )	....
– Good attractiveness: .... ( )	....
– Medium: .... ( )	....
– Regular Attractiveness: …..... ( )	....
– Little attractive: .... ( )	

Table XII.

Analyzing "entry barriers" is similar to analyzing the threats of new entrants in the business. According to Porter (2009), understanding the level of entry barriers is essential to assess the limits of the sector's profit potential.

The results show a final average of four on a scale from 1 to 5, a good attractiveness, indicating a relatively small threat from new entrants and a potential to make a profit (Table XIII). The results show a certain difficulty for new entrants into the business; consequently, this reduces the possibilities for new competitors to obtain a portion of the sector's profit.

The "Exit Barrier" factor has a final average of two on a scale from 1 to 5, indicating a high difficulty in selling or closing a company. These results are not desirable for the industry, which is further dampened by legal and social restrictions on the closing or sale of the business and the long time taken to recover the initial investment.

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Table XIII.
Results for the entrance barrier factor

Strategic factor	Vivo (1 a 5)	Oi (1 a 5)	Embratel (1 a 5)	Claro (1 a 5)	Approximate average result
1. Entry barriers	5	4	5	3	4
2. Exit barriers	1	2	3	1	2
3. Market positioning	4	4	4	4	4
4. Customer negotiation power	2	4	2	3	3
5. Rivalry of equal products	3	2	3	4	3
6. International product rivalry	3	3	3	4	3
7. Supplier bargaining power	3	4	3	2	3
8. Supply chain management	3	4	3	3	3
9. Technological innovation	3	4	3	3	3
10. Substitute product	2	3	2	2	2

Analyzing "Market Positioning" alerts managers and entrepreneurs to the level of attractiveness in terms of market positioning. The positioning strategy is a way for firms to fight competition or to identify a position in a sector where there are fewer competitors (Porter, 2009). The results in the table related to "Market Positioning" show a final average of there on a scale from 1 to 5 and evidence that, in isolation, the business situation is favorable in terms of competitive positions from the management point of view. However, the item "Large number of competitors in the same positioning" is decreasing the final average and requires special attention.

The results for "Customer Negotiation Power" show a final average of three on a scale from 1 to 5, demonstrating that, in isolation, the business situation is at an average level. Customers have a relatively high number of options with regards to telecom operators, which leads to this mid-level result for the companies in terms of relative ability to generate profit. The situation for Vivo and Embratel is not favorable. These firms' clients are exerting a great characterized by aggressive offers.

The results related to "Rivalry of Equal Products" yielded a final average of three on a scale of one to five, indicating a regular result in terms of current rivalry. The average results for this strategic factor are negatively affected by the operators' costs.

For the "International Product Rivalry" strategic factor, the final result of three on a scale of one to five indicates an average level of attractiveness, if considered in isolation. Tax regulations had a low score, a sign that this item contributed to decreasing the overall result.

The results for "Supplier Bargaining Power" have a final mean of three, which indicates a medium level of supplier power in relation to the operators. On a scale from 1 to 5, this factor, in isolation, means that suppliers cannot put very strong pressure on negotiations with telecom operators, as this would reduce the attractiveness of their business. However, Claro seems associated with a greater pressure from suppliers in negotiations.

The "Supply Chain Management" results have a final average of three, indicating a medium power in the strategic management of the supply chain. Considering this factor in isolation, supply chain management does not seem to have a positive or negative influence on the competitiveness and attractiveness of the business. However, the operator Oi shows a good performance, which demonstrated the efficiency in its strategic supply chain management compared to other operators.

"Technological Innovation" yields a final result of three for the intensity of this strategic factor. Although the final result suggested average importance, based on the personal interviews, some managers affirmed that it is an extremely sensitive factor for the telecommunications sector. Thus, the time to develop innovations in relation to competitors may be a decisive competitive factor.

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For "Substitute Products," the final result is an average of two, indicating that regular operators' competition with substitutes was rather low, if we consider the substitute product factor alone. These firms face a high number of substitute products that impair the business attractiveness.

Summary results of the preliminary frames for each factor

Table XIV presents a general summary of telecom operators' strategic factors, which indicates several dangers and opportunities based on the surveys of all operators.

Operators should strengthen entrance barriers because they can reduce the entry of new competitors and optimize their competitive advantage. Exit barrier is a reason for concern because the results demonstrate the difficulty in winding up or sell a business. The presence of contracts to operate networks and telecommunication services is negatively affected by this factor since operators cannot leave a business with poor profitability. The good results for market positioning illustrate that this factor should be strengthened to optimize possible competitive advantages. However, the results on customer power require some attention. A high client bargaining power interferes by negatively affecting the prices of the firms' products and pitting competitors against each other. In addition, product rivalry should also be addressed because a high number of competing products will directly interfere with profitability. Firms should also consider the results for international product rivalry because international trade creates an increasingly globalized environment characterized by lower entry barriers, increased competition and greater opportunities for expansion. The availability of substitutes has lower scores, indicating a high number of substitute products competing for success that can ultimately limit the firm's potential returns.

Supplier power also has average scores, indicating that powerful vendors can squeeze the firm's profitability, which the firm cannot recover through cost reductions or raise the price of its product. The medium results for supply chain management also require attention because this factor has taken a prominent position in the organizational strategic scenario.

The mid-level results for technological innovation require firms' attention because the telecommunication sector needs to invest in network technology, which can be a competitive factor. However, firms must balance the relationship between technological innovation and company performance.

Conclusion

After examining the existing literature, we proposed a tool that can effectively quantify the level of market competitiveness, its attractiveness for a firm, and the relative ability of the firm to generate profits.

This assessment is a function of the importance placed on each strategic factor. The quantitative results for these factors, along with the field research, can give managers a better understanding of their business segments.

The periodic use of this quantification tool to analyze market segment competitiveness and relative ability to generate profits can provide important insights for market participants and new entrepreneurs. It may also help understand how an industry evolves over time, especially in terms of the strategic moves of competitors and changes in the environment. Furthermore, entrepreneurs can realize how the intensity of each strategic factor behaves and use this assessment to make better decisions for strategic action.

This study contributes to the literature by advancing the knowledge of quantified strategic analysis to enable more compelling decisions for entrepreneurs, practitioners and academics. It also helps to create a better understanding of how and why strategic actions may be implemented in practice.

Future studies can apply this tool not only to quantify the competition and attractiveness in a specific sector, but also to evaluate a business in a purchase or sale transaction.

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Table XIV. Determination of the level of the sector's attractiveness

N	Strategic factor / Types:	More attractive 5	4	Average 3	2	Less attractive 1	Lighthouse crierion: The correct color of the lighthouse: – Red (Danger 1 e 2) – Yellow (Attention 3) – Green (Very good 4 e 5)
1	Entry barriers			X			4 e 5......(X) ʘ
2	Exit barriers			X			1 e 2 . (X) ʘ
3	Market positioning			X			4 e 5.......(x) ʘ
4	Customer purchasing power			X			3 .... (X) ʘ
5	Rivalry national product			X			3 .... (x) ʘ
6	International product Rivalry			X			3 .... (x) ʘ
7	Supplier power			X			3 .... (x) ʘ
8	Management of supply chain			X			3 .... (x) ʘ
9	Technological innovation			X			3 .... (x) ʘ
10	Substitute product			X			3 .... (x) ʘ

(*continued*)

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Result of total points: 30

Total of points:

- Great attractiveness: 42 a 50 points.
- Good attractiveness: 34 a 41 points
- Medium: 26 a 33 points
- Regular Attractiveness: 18 a 25 points
- Little attractiveness: 10 a 17 points

Mark with and X according to total points above:

- Great attractiveness: ( )
- Good attractiveness: ( )
- Medium: (X)
- Regular Attractiveness: ( )
- Little attractiveness: ( )

Table XIV.

Our results show a medium level of competitiveness and attractiveness in the telecommunications industry. This may depend on several key factors. The positive strategic factor is the barrier to entry or the threat of new competitors, as it is hard to begin operations in this sector. However, several negative factors affect the final results: the average to good bargaining power of customers, as they have several substitute opportunities, the high number of competitors adopting similar strategy levels or decreasing the sector's attractiveness, and the extreme sensitivity of the sector to new technologies and, therefore, the need for constant investments to remain in business.

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