
A STUDY CONCERNING OPEN INNOVATION AND ITS RELATION TO INNOVATION AND MARKET ORIENTATION

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ABSTRACT

Many global companies, which are proactive to continuous changes in the market so as to access complementary assets, satisfy customers, pursue growth and sustainable competitive advantage, are practicing open innovation, a new paradigm that uses techniques and tools for the development of an innovative collaboration network. Furthermore, there are studies suggesting that companies ought to be market-driven so innovation might be successful. Therefore, this research sought to contribute with the scientific body by addressing the new open innovation paradigm (Chesbrough, 2003) and the widespread strategy of market orientation in the field of innovation. To this effect, we sought to determine whether there is positive correlation between open innovation, innovation and market orientation based on Jaworski and Kohli's (1993) three pillars. The empirical study was conducted by means of a quantitative survey with the application of a questionnaire at different corporate functional levels. To treat data, we adopted the Spearman's statistical correlation method. Results linked to the theoretical framework demonstrated that innovation is related to market orientation, but this in turn has no significant relationship with open innovation. It was also verified that there is a deficiency in the generation and dissemination of intelligence, which

are fundamental for the correlation between market orientation and open innovation.

Key-words: Innovation. Open innovation. Market orientation.

UM ESTUDO SOBRE *OPEN INNOVATION* E SUA RELAÇÃO COM INOVAÇÃO E ORIENTAÇÃO PARA O MERCADO

RESUMO

Muitas empresas globais proativas às mudanças constantes do mercado, para acessar os ativos complementares, satisfazer os clientes, buscar o crescimento e vantagem competitiva sustentável, estão praticando a *open innovation*, um novo paradigma que utiliza técnicas e ferramentas para o desenvolvimento de uma rede de inovação colaborativa. Além disso, há estudos que sugerem que a empresa deve ser orientada ao mercado para a inovação ser bem-sucedida. Portanto, esta pesquisa procurou contribuir com o corpo científico abordando o novo paradigma de *open innovation* (Chesbrough, 2003) e a estratégia difundida de orientação para o mercado no âmbito da inovação. Dessa forma, buscou-se verificar se existe correlação positiva entre *open innovation*, inovação e orientação para o mercado com base nos três pilares de Jaworski e Kohli (1993). O estudo empírico foi desenvolvido mediante uma pesquisa quantitativa com aplicação de um questionário em diferentes níveis funcionais das empresas. Para o tratamento dos dados, adotou-se a técnica estatística de correlação de *Spearman*. Os resultados atrelados ao arcabouço teórico demonstraram que a inovação está relacionada com a orientação para o mercado, mas não há uma relação significativa deste com *open innovation*. Verificou-se também a existência de deficiência na geração e disseminação da inteligência, determinantes para a correlação entre orientação para o mercado e *open innovation*.

Palavras-chave: Inovação. *Open innovation*. Orientação para o mercado.

1 INTRODUCTION

Fasnacht (2009) states that the company's vision for the future is to always pursue innovation as a means of operating in a given market, which thus constitutes a means for it to gain sustainable competitive advantage and/or of seeking sustainable business growth. Having good ideas is not enough. The company must be able to convert them into products/services delivered to clients. Thus, to access physical and tacit resources, many companies are practicing open innovation by means of the use of techniques and tools for the development of a collaborative innovation network where there is an active flow at the porous frontiers between the company and the market for the transfer of resources. Hence, innovation management is a process that stimulates the application of knowledge. To this effect, there are many studies concerning corporate behaviour theories in as much as its behaviour in exploring innovation opportunities in pursuit of performance improvement is concerned (Tigre, 1998). Previous studies suggest that one of the strategies for the company to excel in innovation is to be market-oriented, an attribute that is vital to all economic activities (Renko, Casrud & Brännback, 2009). Other authors emphasize that this strategy presents a strong relation with corporate performance (Jaworski & Kohli, 1993; Kohli & Jaworski, 1990; Narver & Slater, 1990), in addition to being a relevant strategy for all types of market environments (Narver & Slater, 1990).

Nelson and Winter (1982) emphasize that companies take decisions based on their repository of knowledge (products, technologies, markets, amongst others) and in environment variations. Furthermore, it's worth noting that the evolutionist theory comprises the capability companies present to respond to the changing environment, which implies in their opening to the respective external environments, so that they might improve their ability to innovate (Tigre, 1998). Zollo and Winter (2002) further state that the development of dynamic capabilities as a result of organizational learning might collaborate with the management of strategic alliances and acquisitions, given that the company may form differentiated

capabilities in function of its experiences and learning. Nevertheless, the importance of satisfying customer demands so as to maintain and extend the market share and explore new markets must be mentioned, given that they are core to the survival of the company (Fasnacht, 2009).

Previous research connects market orientation with process, product and management innovation (Galão, Frutos, Silva & Pacagnan, 2007; Vasquéz, Santos & Alvarez, 2001; Faleiro, 2001) and with performance (Agarwal, Erramilli & Dev, 2003).

Therefore, Galão et al. (2007) studied the relation between innovation and market orientation in industries of the clothing segment and confirmed a positive, yet weak, association between market orientation and innovation, indicating that market orientation behaviour leads to the conduction of innovation practices.

Vasquéz et al. (2001), on the other hand, observed that market orientation presents positive effects on innovation strategy. Agarwal et al. (2003) confirmed that market orientation stimulates innovation which in turn, improves performance. However, amongst researched studies concerning innovation and market orientation, none were found establishing a relation between the two constructs – market orientation and open innovation practices.

2 RESEARCH PROBLEM

Is there a significant relation between these three constructs: open innovation, market orientation and innovation?

3 OVERALL OBJECTIVE

Verify the existing relation between open innovation, market orientation and innovation in the Brazilian scenario.

3.1 SPECIFIC OBJECTIVES

- Identify if companies innovate.
- Identify if companies adopt open innovation by means of collaborative R&D partnerships.
- Identify if companies are market-oriented.
- Verify the existing correlations between the three constructs: open innovation, market orientation and innovation.

This study analysed the correlations between innovation, open innovation practices and market orientation strategies by means of a quantitative research applied at different functional levels of companies located in São Paulo.

Based on this general approach, the research was structured into five sections. The first part examined the theoretical framework pertaining to innovation, open innovation and market orientation strategies. The proposed hypothetical model to be empirically tested followed suit and finally, the results obtained were discussed and the limitations and implications for future research were identified. In the last section, final considerations were presented.

4 BIBLIOGRAPHICAL REVISION

4.1 INNOVATION

As years went by, the concept of innovation gained strength and with the globalization process, became part of the strategy of companies focused on economic performance and value creation. Schumpeter (1942) was the first to emphasize the fundamental relevance of innovation within the capitalist context and introduced the notion of “destructive creation” for the survival of companies. For the author, the innovation attribute was labelled onto new merchandize, new methods or new commercial opportunities.

According to Afuah (1998), innovation is the use of new knowledge to offer a new product or service that clients want and involves its invention and sale. Thus, innovation might reside in the formulation of the product, in packaging, in processes, in marketing techniques or in services rendered to the client and may represent the survival or leadership of a company and even alter a society's habits and behaviours.

There are many types of innovations and it may either be radical or incremental, of processes, products or services. Radical innovation is the construction of a completely new product/service, something that still does not exist and therefore requires large investments in research and development. Its chances of success are smaller but present a probability of greater rewards and this is why they provide competitiveness in the long term (Vasqu ez et al., 2001).

Incremental innovation corresponds to product improvements, requires less R&D effort and therefore is usually more common, presents smaller rewards and does not provide competitiveness in the long term (Vasqu ez et al., 2001).

Innovation, according to Fasnacht (2009), is a solution for the company's growth since organizations thought of as being innovative present a superior performance on the stock exchange market, with above average returns for shareholders and are perceived as conductors of corporate economic progress and survival.

According to the Oslo Manual (OCDE/FINEP, 2006) a company is perceived as innovative when it introduces new or improved products/processes to the market or segment it operates in.

Sbragia, Stal and Campan ario (2006) and Fasnacht (2009) emphasize that innovation is necessary for companies to become competitive so as to ensure their survival in the long term. The authors further state that the largest corporate challenge is to identify sources of innovation that truly produce significant returns. Thus innovation calls for the grasp on physical and tacit resources in addition to essential skills that

enable the innovation process, all of which involves costs, knowledge and time to obtain know how in addition to the need to promote and retain talent in the company. These authors emphasize that the sources of innovation may be internal and external to the company.

Thus, Chesbrough (2003), Sbragia et al. (2006) and Fasnacht (2009) propose a cooperation as an alternative to the difficulties some companies may face in pursuing innovation (mostly small companies), such as technological complexity, high costs, risks and pressure for results given expenses in R&D. According to Sbragia et al. (2006), such cooperation is necessary for the leveraging of resources, to share risks, conduct research and joint ventures. For Teece (1986), many companies fail to obtain economic returns on the innovation process because they forget imitators end up benefitting the most from innovation by increasing their profits and reducing R&D risks and costs, and for this reason, this author supports the importance of integration and collaboration in the innovation process.

4.2 OPEN INNOVATION

The manner how companies generate new ideas and market them varies according to their philosophy. A new approach concerning innovation that has been a matter of discussion is known as open innovation. This approach was proposed by Chesbrough (2003), who, in the XXth. Century, identified that companies that control the success of innovation present a philosophy based on the closed innovation model, i.e., they generate their own ideas, develop, sell and distribute their new products/services. According to the author, these closed, based on control companies, end up losing business opportunities since innovation takes time and calls for the full grasp of technologies, in addition to expenses for conduction purposes, and therefore miss the opportunity to access a vast amount of knowledge and skills. Thus he proposed a new and more efficient approach for companies to practice innovation. This new model was called open innovation and deals with the search and acquisition of knowledge for R&D processes in addition to its sale, by means of partnerships.

Therefore, Chesbrough (2003) defines open innovation as a paradigm for companies that seek technological advances by means of adopting internal and external paths to the market.

Rigby and Zook (2002), in their article about open-market innovation, discuss the open innovation prerogative by considering external sources mechanisms for improvement in speed, costs and quality of innovations. For Rigby and Zook (2002), Chesbrough (2003) and Laursen and Salter (2005), this is an approach that utilises tools and transfers mechanisms of physical and tacit resources by means of collaborative networks such as licenses, joint ventures and strategic alliances, known as collaborative innovation networks.

This is how companies that utilize the open innovation model import and export ideas to the market so as to generate value. To this effect, companies establish cooperation with research institutions, universities, suppliers, clients and even with their competitors for the technological development of their products/services (Rigby & Zook, 2002; Chesbrough, 2003). Often this involves partnerships with start up companies, covenants with universities and licensing agreements. In this case, the idea can be produced outside corporate laboratories and bought for commercialization purposes – or inversely, might be produced internally at corporate labs and sold to be commercialized by other companies (Chesbrough, 2003). In this case, innovation easily shifts from a current market to another new one. Thus integration with clients is a valuable strategy for cost improvement, quality and innovation speed to market (Rigby & Zook, 2002; Chesbrough, 2003).

With this new approach, a growing number of companies values the market and increases the import and export of ideas which in turn improves the speed, cost and quality of the innovation, in addition to its core business. Open innovation, by means of alliances, also enables the sharing of risks, access to complementary skills and the implementation of synergies between external ideas and knowledge combined with in-company R&D (Gassmann, 2006).

As to open innovation advantages, Rigby and Zook (2002) emphasize the benefits of financing, generating and marketing innovation, such as:

1) multiplication of innovation opportunities by means of the importation of new ideas, extending the availability of different types of expertise which enables the improvement of innovation costs, speed and quality;

2) earn money and retain employee talent by exporting ideas, promoting royalty earnings and the externalization of collaborator ideas, which stimulates creativity and ensures motivation and talent retention;

3) measure the real value of innovation and verify if the investment in innovation is justified by the export of innovation, i.e., verify if the product/service is really worthwhile;

4) identify strengths and weaknesses so as to present transparency in that which is truly done best, its core business, which must result in economic advantages, i.e., present lower costs and/or greater quality than that of competitors.

Other benefits include the improvement in the flow of in-company information and of its reputation as a sound innovation partnership (Rigby & Zook, 2002; Chesbrough, 2003).

Companies that adopt open innovation reap benefits in turbulent market situations whereby unforeseen changes call for rapid innovations and this is used as a given to explore multiple product strategies (Rigby & Zook, 2002; Chesbrough, 2003).

Fasnacht (2009), in his open innovation study in financial services emphasizes that the closed paradigm change is vital to the survival of companies since turbulent markets or those experiencing growth require flexible and open business models. These models integrate in an improved manner the needs of clients and strengthen corporate trust in their business clients and partners by means of narrower and more trustworthy relations.

However Chesbrough (2003) and Gasmann (2006) emphasize that open innovation practices must not be considered mandatory for every company and every innovator. Gassman (2006) further mentions that some companies, such as nuclear and military industries, must remain in the closed model to safeguard intellectual property. One must therefore emphasize that companies are not to change paradigm since there is a continuum between closed and open innovation, and the strategic choice is often defined by the market conditions in which companies operate (Rigby & Zook, 2002; Chesbrough, 2003). Considering market condition prerogatives, open innovation practices are thought to be favourable (Rigby & Zook, 2002) when the intensity of innovation in the environment is high, investment for innovation is low, the need for cumulative innovations is high, applicability between companies or industries is high and market volatility is also high.

Igartua, Garrigos and Hervas-Olivier (2010) agree with innovation management in as much as techniques and tools for the development of innovation collaborative networks, such as the open innovation strategy, are concerned. In an empirical study, the authors analysed the role of innovation management tools and organizational changes required to adapt collaborative innovation models and emphasized the variety of fields and tools involved in innovation management (Igartua et al., 2010) which includes innovation strategy, portfolio management, project management, organizational culture and leadership, Human Resources, external relations, the organizational structure profile, innovation processes, performance measures, marketing, resources, knowledge, intellectual property and technology management. Despite its relevance, innovation management tools are not fully explored by companies due to the lack of knowledge of their potential use. The authors conclude that the introduction of these techniques does not take place overnight or in an isolated manner, and that to this effect, planning and cooperation between partners is required.

Laursen and Salter (2005) noticed in the empirical study that companies that adopt the strategy of seeking knowledge externally – by

means of broad (number of external sources) and in-depth (how the company deeply utilizes the knowledge extracted from the various sources) research to access critical knowledge sources – tend to be more innovative. However there are uncertainties as to the rewards of engaging in these relationships which, when negative experiences occur, might lead the company to express aversion to taking risks in new ventures.

Despite the benefits that open innovation practices present, risks concerning the sharing of innovation with competitors must be taken into account since they involve intellectual property and patent rights. Thus, these risks must be managed.

Considering that to be successful innovation must meet customer demands and that open innovation provides value to customers and to the company as a whole (Fasnacht, 2009), in this study, the market orientation strategy, ground on customer satisfaction, is correlated with innovation in as much as market intelligence management, its dissemination and its capacity to reply to customers, is concerned.

4.3 MARKET ORIENTATION STRATEGY

Previous studies suggest that one of the strategies for the company to excel in innovation is market orientation which is very important for all economic activities (Renko et al., 2009) since it can be considered a distinct and additional source of sustainable competitive advantage (Kohli & Jaworski, 1990).

Kohli and Jaworski (1990) outlined the domain of the market orientation construct as of marketing literature which comprises cultural and behavioural phenomena at corporate level. Thus, they proposed a scale to measure market orientation known as *Markor*, which comprises three market orientation pillars – generation of intelligence (decision support systems), dissemination of intelligence between company departments and responsiveness (the ability a company has to rapidly respond to customer needs). Thus, the company's focus is on information and behaviour.

Market orientation thus is defined as the manner in which the organization generates market intelligence pertaining to the true and future needs of clients and finally, its capacity to rapidly respond to the needs of this market (Kohli & Jaworski, 1990). To this effect, companies need to be structured to promptly respond to the needs of their clients and mostly, have closer connections with their markets to identify their future needs.

Normally, market orientation is more closely related to performance in turbulent as opposed to stable, markets (Jaworski & Kohli, 1993). Companies that are market-oriented develop more innovative products (Slater & Narver, 1996).

As previously mentioned, market orientation behaviours are related to innovation practices (Galão et al., 2007; Agarwal et al., 2003; Vasquéz et al., 2001; Faleiro, 2001), however one must note that despite market orientation being a sustainable competitive advantage, there are barriers which might impact decision making when this strategy is adopted.

4.3.1 Market orientation barriers

One of the barriers to market orientation according to Jaworski and Kohli (1993), is the level of risk taken on by managers and the willingness to accept failures that new products/services may present. The authors emphasize that inter-department conflict and the absence of formality and rules for the implementation of market orientation are some of the factors that impact market orientation. Other authors also contribute with the outlining of functional barriers to market orientation in as much as the flow of information (Slater & Narver, 1995), excess of information at managerial levels, management conflicts and political motivation (Harris & Piercy, 1999) and also market overlooking, is concerned, a situation whereby the company focuses on the product or service it offers without having a clear understanding of the market (Day, 2001).

5 HYPOTHESIS

In this study the intent is not to fully explore the subject matter or test the level of innovation at market-oriented companies or the level of innovation of companies that practice open innovation. Rather, the intent is to identify if there is a relation between open innovation practices and market orientation strategies.

As of the assumption that companies are willing to innovate, that those more market-oriented are willing to develop more innovative products and that, in pursuit of innovation, they practice collaborative relations with external partners, as illustrated in Figure 1, one might formulate the following hypothesis:

- **H1a/b:** There is a positive correlation between innovation/open innovation and market orientation.
- **H2a/b:** There is a positive correlation between innovation/open innovation and the generation of intelligence.
- **H3a/b:** There is a positive correlation between innovation/open innovation and dissemination of intelligence.
- **H4a/b:** There is a positive correlation between open innovation and responsiveness.
- **H5:** There is a positive correlation between innovation and open innovation.

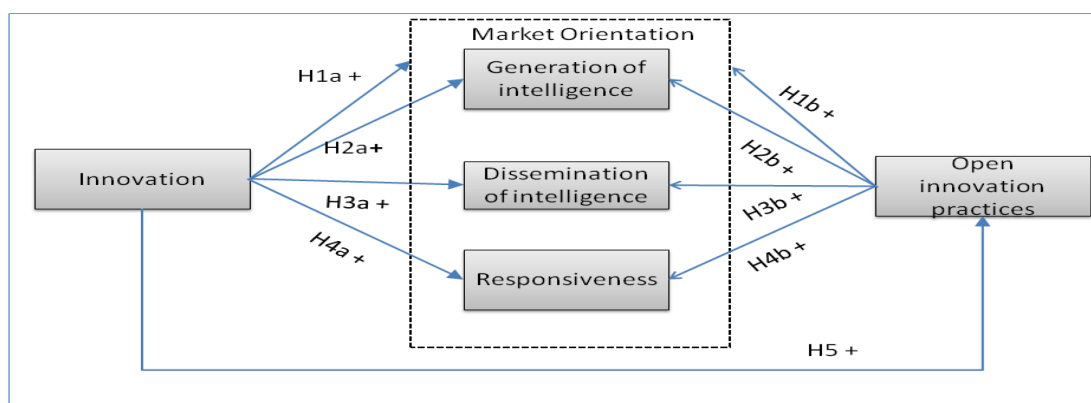


Figure 1: Hypothetical model

Source: Prepared by the authors.

6 METHODOLOGICAL PROCEDURES

This research has a quantitative character, which implies in the identification of the theoretical framework as a preliminary phase for the variable measuring process as a means to better comprehend the pillars of this study.

In the initial phase, a theoretical framework in alignment with the research problem was identified from which the affirmations for the constructs innovation and open innovation were extracted. Based on the theoretical reference, the Jaworski and Kohli (1993) *Markor* scale was chosen so as to evaluate the construct market orientation.

With views to empirically examining the correlations between innovation and the open innovation strategy, in both extremes and market orientation, a quantitative research was conducted by means of a structured questionnaire. A target audience was chosen as from which the variables at different functional levels of companies located in São Paulo were verified.

As of the theoretical reference, seven affirmations were developed for the innovation construct with views to verifying if the company invests in innovation, the segment's frequency of innovation, the intensity of launch and products/services improvements and the company's satisfaction with their innovation process, amongst others.

For the open innovation construct, eight affirmations were utilized to evaluate if the company uses collaborative relationship techniques for the development/improvement of products/services.

As to the market orientation construct, to adequate the study, an adaptation of Jaworski e Kohli's (1993) *Markor* scale and of the Markor adaption performed by Renko et al. (2009) was performed. In this research, taking on three market orientation pillars, focus lay in the generation of intelligence (incorporation of the ten *Markor* scale affirmations), in the dissemination of intelligence (incorporation of Renko et al. 2009 adaptation's nine affirmations) and responsiveness, or speed of reply

(incorporation of Renko's et al. (2009) three affirmations). In Chart 1 that follows, the affirmations utilized for the study are presented.

To evaluate the three constructs, a structured questionnaire was applied, duly forwarded by e-mail to the researched population, containing the affirmations relative to the three constructs evaluated. The company, in this case, is the unit of analysis. The e-mail explained the research objectives and requested support in contribution. The period of data collection ranged from the months of November 2010 to January 2011. In total, 200 e-mails were sent (170 individuals and 30 companies). Of the 30 companies, five returned the e-mail without the possibility of reply and the remaining 25 did not reply. A return of 30 valid questionnaires was obtained, which represents a 15% reply rate which, according to Malhotra (2001) and Hair, Black, Babin and Anseron (1998), might be considered a reasonable return rate. The study focused on the state of São Paulo and, from the sample's total, 21 are companies of the services segment, 5 from the industry segment and 4 from the commerce segment.

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|---|
| 1) INNOVATION |
| The need for innovation in products/services at my company is: |
| The investment in the development of new products/services at my company is: |
| The intensity of new products/services launch is: |
| The intensity of improvements in products/services is: |
| Satisfaction with the quality of innovation or with the frequency of products/services innovation at my company is: |
| The applicability of my company's products/services at other companies/industries is: |
| The frequency of innovation in the market in which my company operates is: |
| 2) OPEN INNOVATION – RELATIONSHIP NETWORKS National and international partnerships |
| IN THIS COMPANY |
| The existence of a local relationship with external partners for the development of new products/services is: |
| The importance of external partnerships for the development of new products/services is: |
| The level of dependence with external partners that contribute with the development of new |

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| products/services is: |
| The use of contracts in external partnership relations is: |
| Transparency in joint work with external partners is: |
| The level of information sharing with external partners is: |
| The duration of our external partnerships is: |
| The quantity of partnerships for the development of products/services for my company is: |
| 3) MARKET ORIENTATION |
| IN THIS COMPANY |
| Generation of Intelligence |
| The frequency with which my company meets clients to know which products/services they desire in the future is: |
| The frequency with which employees directly interact with clients to learn how to better serve them is: |
| The frequency with which my company conducts market research is: |
| The frequency with which my company outsources market research is: |
| The speed with which my company detects customer or potential client preference for products/services is: |
| The frequency with which my company researches the client to evaluate the quality of our products/services is: |
| The frequency with which my company speaks to people who can influence our final clients purchases is: |
| The collection of market information by informal means is: |
| The quantity of information concerning our competitors which is independently generated by several individuals/departments of our company is: |
| The speed in detecting fundamental changes in the industry is: |
| The frequency with which our company revises the needs of our clients is:: |
| Dissemination of Intelligence |
| A frequência de conversas informais sobre as táticas e estratégias de nossos concorrentes é: |
| The frequency of inter-departmental meetings to discuss trends and market development is: |
| The frequency of meetings with other companies to discuss market trends and developments is: |
| The frequency with which the marketing department discusses the future needs of customers with |

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| other functional departments is: |
| The frequency with which my company circulates documents with information on our clients is: |
| When something important happens to our clients in our market, the speed with which the entire company learns about this is: |
| The frequency with which our company informs data concerning customer satisfaction in all corporate levels is: |
| The existence of communication between people of my company that are interested in the development of markets is: |
| When someone from my company discovers something of relevance concerning the market, the frequency with which he/she shares this information with others is: |
| Responsiveness |
| The frequency with which my company interacts with ruling institutions that determine industry standards is: |
| The comprehension of markets that drives efforts for the development of new products/services in my company is: |
| The frequency with which my company ignores the needs to change products/services for clients is: |

Chart 1: Basic affirmations for the study

Source: Prepared by authors with the adaptation of Jaworski and Kohli (1993) and of Renko et al. (2009).

The statistical SPSS software was used to analyse data. First, reliability was analysed by means of Cronbach’s Alpha coefficient using a 0,7 passing grade and subsequently, the analysis of correlations was conducted.

Innovation, open innovation and market orientation were measured utilizing a *Likert* type scale (5 concurrence points: Very Low(a)-Very High(a)). Subsequently, keeping the construct’s uni-dimensionability in mind, the added load was conducted to represent multiple aspects of a concept in a single measure (Hair et al., 1998).

To establish correlations with ordinal scales, *Spearman*’s statistical correlation technique, which uses classifications that vary from -1,0 to+1,0, calculated as of innovation, open innovation and market orientation

constructs added scores, was adopted (Generation of Information, Dissemination of Information and Responsiveness).

7 ANALYSIS OF RESULTS

7.1 RELIABILITY ANALYSIS OF THE SCALES

The innovation, open innovation constructs, the Cronbach's Alpha coefficient, as per that presented in Table 1, resulted in, respectively, 0,894 and 0,895, confirming that there is reliability (Malhotra, 2001; Hair et al., 1998). As to the market orientation construct, Cronbach's Alpha was evaluated between three elements – the generation of intelligence, dissemination of intelligence and responsiveness -, resulting in 0,778, 0,865 and 0,304, only confirming reliability for the generation of intelligence and dissemination, which is the focus of the study (Malhotra, 2001; Hair et al., 1998).

Table 1: Cronbach's Alpha coefficient and its measures

| Constructs and their dimensions | Cronbach's Alpha |
|---------------------------------|------------------|
| Innovation | 0,894 |
| Open Innovation | 0,895 |
| Market orientation | 0,892 |
| Generation of Intelligence | 0,778 |
| Dissemination of Intelligence | 0,865 |
| Responsiveness | 0,304 |

Source: Prepared by the authors.

7.2 ANALYSIS OF CORRELATIONS

As demonstrated in Table 2, it was observed that the **1st. hypothesis** was supported since there was a positive correlation between market orientation and innovation (0,629(**)). In this case, companies

concerned with the innovation of their products/services seek to understand the real needs of their customers thus the concern with generating market intelligence, followed by the dissemination of intelligence and responsiveness. All three market orientation dimensions prove to be strong for the conceptualization of the market orientation construct. This result is in alignment with the theory whereby market orientation stimulates innovation (Agarwal et al., 2003; Vasquéz et al., 2001).

Table 2: Correlation between innovation and market orientation

| | Generation of Intelligence | Dissemination of Intelligence | Responsiveness | Market orientation |
|-------------------|-----------------------------------|--------------------------------------|-----------------------|---------------------------|
| Innovation | 0,672(**) | 0,475(**) | 0,472(**) | 0,629(**) |

Source: Prepared by the authors.

Note: * Correlation is significant at $p < 0,01$ level

In the analysis of innovation correlations with market orientation dimensions, one notices that the greatest concern lies in the generation of intelligence since the **2nd. hypothesis** – correlation between innovation and generation of intelligence – was supported (coefficient of 0,672(**)). That is, companies seek to collect information from their external environment (clients) to ground the decision support system innovating products/services. The **3rd. hypothesis** – correlation between innovation and dissemination of intelligence – was supported (coefficient of 0,475 (**)), indicating that companies seek to conduct inter-departmental dissemination of the intelligence. The **4th. hypothesis** – correlation between innovation and responsiveness – was also supported with a coefficient of 0,472(**), which indicates that companies present the ability to respond to the needs imposed by the external environment such as ruling institutions.

Hypothesis 1b – correlation between open innovation and market orientation –, as illustrated in Table 3, was supported. However, it is not significant since it presented a **0,046** correlation coefficient. With this

result, one verifies that there still are companies which are closed to innovation, a fact that, as emphasized by theories, depends on the conditions of the market in which they operate (Fasnacht, 2009; Chesbrough, 2003; Rigby & Zook, 2002). Therefore there is the need to analyse the market in which these companies are inserted to verify if they are within turbulent or stable markets and then evaluate if it is favourable to use open innovation practices or not.

Table 3: Correlation between open innovation and market orientation

| | Generation of Intelligence | Dissemination of Intelligence | Responsiveness | Market orientation |
|------------------------|-----------------------------------|--------------------------------------|-----------------------|---------------------------|
| Open innovation | -0,049 | -0,104 | 0,222 | 0,046 |

Source: Prepared by the authors.

Note: *Correlation is significant at $p < 0,01$ level.

Hypothesis 2b – correlation between open innovation and the generation of intelligence – was not supported since it presented a negative coefficient of **(-0,049)**. **Hypothesis 3b** – correlation between open innovation and dissemination of intelligence – likewise was not supported since it presented a negative coefficient of **(-0,104)**. Both these hypothesis – 2b (Generation of Intelligence) and 3b (Dissemination of Intelligence) – were determinant to the performance of hypothesis 1b results and demonstrated that there is a gap to be closed by these companies in as much as generation and dissemination of information is concerned.

Hypothesis 4b – correlation between open innovation and responsiveness – was supported since it presented a **0,222** correlation coefficient. In this case, companies are concerned with replying to conditions imposed by the external environment but not, however, with the implementation of external sources for the development of products/services. Such implementation implies in higher risks and the

consideration that there are certain barriers that impair companies from being market-oriented (Harris & Piercy, 1999; Slater & Narver, 1995; Jaworski & Kohli, 1993; Day, 2001; Van de Ven, 1986). These barriers can directly impact the generation of intelligence and its dissemination which in turn impact the market orientation strategy as a whole, and thus, the implementation of the innovation.

To verify if companies that innovate are practicing open innovation, **hypothesis 5** was tested – correlation between innovation and open innovation practices -, illustrated in Table 4. It was observed that this hypothesis was supported since the result demonstrates that there is a positive correlation, yet not significant, with open innovation (correlation coefficient of 0,191).

Table 4: Correlation between innovation, open innovation and market orientation

| | Innovation | Open innovation | Market orientation |
|-------------------|------------|-----------------|--------------------|
| Innovation | - | 0,191 | 0,629(**) |

Source: Prepared by the authors.

Note: *Correlation is significant at $p < 0,01$ level.

As to verifying if market-oriented companies are utilising open innovation practices, based on the correlation coefficient obtained between open innovation and market orientation (0,046), one might state that they practice few partnerships and agreements with their stakeholders in the products/services development/improvement process. This result confirms that companies are innovating given that they are market-oriented however, they do not seek to open frontiers to the process of developing/improving their products/services, particularly in as much as the generation of intelligence and its dissemination is concerned. That is, practiced innovation, as observed from the negative results concerning the correlations between open innovation and the Generation of Intelligence

and Dissemination of Intelligence, according to Chesbrough (2003), traditionally is closed to the external environment.

To visualize the results of the hypothesis, Figure 2 illustrates the values obtained with the analysis of correlations.

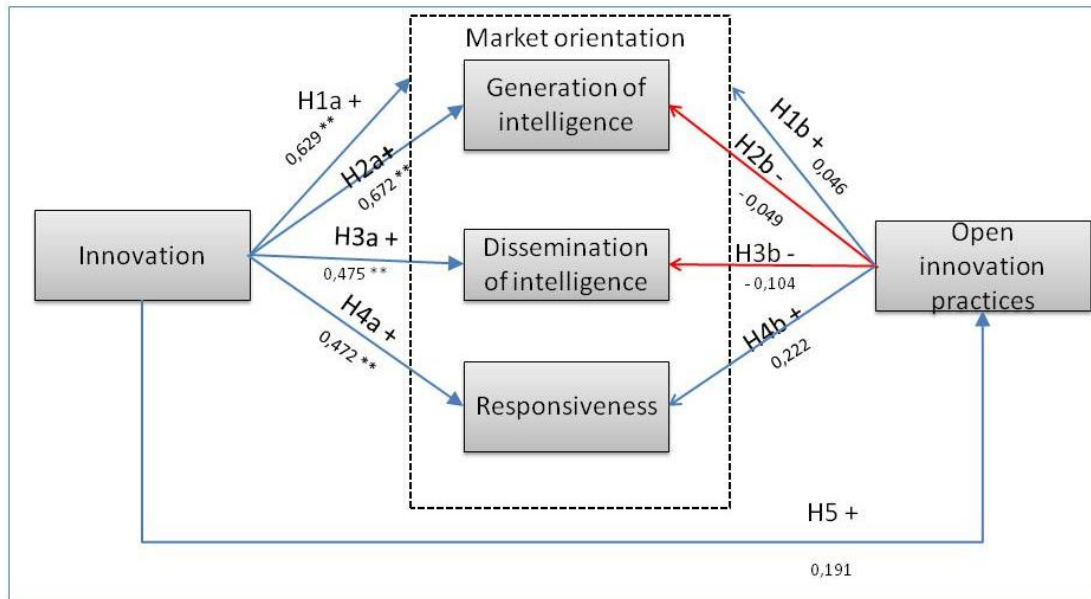


Figure 2: Results of the tests of hypothesis

Source: Prepared by the authors.

8 FINAL CONSIDERATIONS

It is worth reinforcing that companies that are concerned with innovation and with understanding and responding to the market have the option to adopt open innovation practices by means of implementing external sources for the development and improvement of products/services.

In this research, attempt was made to contribute with the scientific body by discussing the new open innovation paradigm and the widespread market orientation strategy in as much as innovation is concerned. To this effect, efforts were placed on verifying if there is positive correlation

between open innovation and market orientation based on Jaworski and Kohli's (1993) three pillars.

As observed from the results obtained, the hypothesis were partially supported, confirming that innovation is significantly related with market orientation which proves that in the pursuit of innovation, companies generate market intelligence, disseminate it and respond to the needs of clients. It was also verified however, that there is no significant relationship between open innovation and the market orientation strategy (two hypothesis of these constructs were not supported) which indicates that these companies practice few partnerships and agreements with their stakeholders for the process of development and improvement of their products/services. This mostly takes place because they present a deficiency in the generation and dissemination of intelligence, which confirms that companies are innovating because they are market-oriented but do not however seek to open frontiers to the products/services development/improvement process.

As previously discussed, existing barriers to market orientation must be taken into account (Day, 2001; Harris & Piercy, 1999; Slater & Narver, 1995; Jaworski & Kohli, 1993; Van de Ven, 1986) and the difficulties concerning the opening of the innovation process (Igartua et al., 2010; Gassman, 2006; Laursen & Salter, 2005). Furthermore, in Brazil there are some incentives for open innovation practices as of the passing of Innovation Law Nbr. 10.973/04 of 2004, which safeguards intellectual property rights, a fact that might stimulate the adoption of this strategy. However, this result is in alignment with Chesbrough's (2003) findings, which classifies these companies as practicing a closed innovation philosophy, that is, they generate their own ideas, develop, commercialize and distribute their new products/services and thus, end up losing business opportunities since innovation takes time and calls for the domain over technologies, in addition to expenses to be conducted and therefore miss addressing a large variety of knowledge and skills. According to these aspects, it would be of interest to attempt to comprehend the determinants

that foster the transfer process from a closed paradigm to one that is open to innovation.

Considering that strategic choice is often defined by the market conditions in which companies operate (Chesbrough, 2003; Rigby & Zook, 2002), there is the need to better analyse the market conditions in which these companies are inserted to evaluate if it is or not favourable to use open innovation. Therefore it is suggested that the study focus per market segment to individually analyse strategic choices. Another implication would be the use of another statistical technique to treat data and analyse it in a more detailed manner and thus identify the representation or predominance of each variable in the general context. Nevertheless, considering that the study is not prone to generalization, one must evaluate the representativeness of the sample acquired as a limiting factor, which implies in the need to extend the sample. Since the study only focused on companies located in the state of São Paulo, another implication would comprise extending the scope of the study so as to cover a larger geographical region.

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