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THE RELATIONS BETWEEN INNOVATION AND INTERNATIONALIZATION, AND BETWEEN INNOVATION AND BUSINESS PERFORMANCE: EVIDENCE FROM COMPANIES OPERATING IN BRAZIL

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To my parents with everlasting gratitude,

to all devoted professors, colleagues, and friends with respect.

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I would like to highlight my immense gratitude to my dear parents, who have understood my absence during never ending busy mornings, afternoons, and evenings. My personal sacrifice has become theirs and this is only possible when mutual love is present. Thank you my beloved family.

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"Innovation benefits consumers through the development of new and improved goods, services, and processes. An economy's capacity for invention and innovation helps drive its economic growth and the degree to which standards of living increase."

Roger W. Ferguson Jr.

ABSTRACT

Innovation and internationalization are quite often regarded as important strategies for companies to grow and succeed in the fast pacing market battlefield. Literature has deeply investigated these subjects, separately and together. However, papers on the relations of innovation capability and internationalization degree are still scarce and therefore, under researched. Moreover, although studies on the relations of the innovation capability of a company and business performance pop up quite frequently, they still lack conclusiveness. In order to deepen the understanding on those relations and unveil practical recommendations for managers, this study aimed at describing (1) the relations between innovation capability and internationalization degree and (2) the relations between innovation capability and business performance of companies operating in Brazil. Literature review encompasses concepts on innovation drivers, internationalization, and business performance as well as the relations of (1) innovation and internationalization, and (2) innovation and business performance. As innovation capability is not directly measureable, the conceptual model included a proposal of a construct of innovation capability as a weighted contribution of a set of innovation drivers. The conceptual model provided the foundations for the questionnaire and therefore, the whole field research, which included the delivery of questionnaires to students of graduate programs of three Business schools in Brazil. 528 questionnaires were filled out and they represented 386 different companies. Methodological procedures included a quantitative analysis that encompassed (1) descriptive statistics for demographics, (2) the non-parametric Wilcoxon test for mean comparison, (3) exploratory factor analysis for variable reduction, (3) cluster analysis to identify the association of importance and practice of drivers, and (4) multiple linear regression to identify descriptors of internationalization degree and business performance. Idea generation, people, leadership, and intellectual capital are considered the most important innovation drivers as opposed to funding and portfolio management. Regarding practice, although there was no evidence to distinguish most practiced drivers, structure, time, and reward system were considered the less practiced. When considering importance and practice at the same time, five clusters of drivers were depicted: (1) the most practiced, (2) the most important, (3) the least important, (4) the least practiced, and (5) not the most, not the least. Although drivers of cluster (2) are considered the most important, they are not the most practiced. As a result, in general terms, drivers pertaining to this cluster— people, intellectual capital, generation, conversion, and leadership—should be prioritized while implementing innovation initiatives. Next, while identifying descriptors, funding and diffusion drivers explain 10.6% and innovation capability explains 6.8% of internationalization degree. Findings on the identification of descriptors of business performance are more promising: diffusion, values, strategic alliances, and technologies drivers explain 41.8% of the business performance variability while innovation capability explains 28.1%. Although literature has highlighted the importance of all innovation drivers, the results of this study provide managers with a prioritization when implementing innovation initiatives within their companies, depending on whatever internationalization or business performance output are pursued.

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ACRONYMS AND ABBREVIATIONS

1G: First Generation Innovation Model
2G: Second Generation Innovation Model
3G: Third Generation Innovation Model
4G: Fourth Generation Innovation Model
5G: Fourth Generation Innovation Model
ANOVA: Analysis of Variance
AWU: Annual Work Unit
BNDES: Banco Nacional de Desenvolvimento Econômico e Social
CIM: Cyclic Innovation Model
EDA: Exploratory Data Analysis
EFA: Exploratory Factor Analysis
EMM: Emerging-Market Multinationals
FDI: Foreign Direct Investment
IBGE: Instituto Brasileiro de Geografia e Estatística
MLR: Multiple Linear Regression
MNE: Multinational Enterprises
RBV: Resource-Based View
R&D: Research and Development
SEBRAE: Serviço Brasileiro de Apoio às Micro e Pequenas Empresas
SEM: Structural Equation Modelling
SG: Specific Goals
SLR: Simple Linear Regression
SME: Small and Medium Enterprise
SIN: Systems Integration and Networking
SPSS: Statistical Package for Social Science

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1 INTRODUCTION

The increased pace of globalization and numerous socio-economic factors have changed how companies compete both locally and globally. As a result, companies can no longer afford to rely only on long-term plans as before because markets and industries are quite volatile and competitive. In this context, improvements and new strategies have to be adopted. It is believed that companies must constantly develop new products or services to be able to compete in this changing environment thus achieve above-the-average performance. One possible way for a company to meet this need is through embracing innovation in operational activities to achieve competitive edge (Asa et al., 2013).

Moreover, internationalization and innovation are often regarded as important growth strategies for companies to outperform competitors. In a highly competitive marketplace, although internationalization still remains an option for the successful company—however, more and more it is becoming a must—, there is no doubt about innovation as a means to seek for new and better products and services to precisely meet consumers' needs. The consequence is a positive business performance.

Traditionally strong in tailoring Western products to serve customer needs in their home markets, a small but growing number of companies from emerging markets now participate in original research, tapping into global innovation networks and benefiting from knowledge spillovers. But more focus on generating new ideas and organizational structures to enable innovation is needed to sustain long-term growth (Accenture, 2008).

1.1 Innovation and innovation capability

Over the last years, innovation has become an organizational goal for nearly all companies that fiercely compete in an increasingly globalized world. As a result, managers perceive innovation not only as a new business fashion, but as a real means by which companies will survive in the long term by exploring and exploiting blue oceans of uncontested market space because competing in overcrowded industries is a dead end to sustain high performance (Kim & Mauborgne, 2004). To this regard, the importance of innovation as a driver of performance and competitive advantage is deeply investigated in the literature (Shoham & Fieganbaum, 2002; Kanter, 1999; Roberts, 1999; Hitt et al., 1996; Banbury & Mitchell, 1995). Senge and Carstedt (2001) and McEvily et al. (2004) stress the importance of innovation as one of the primary means by which a firm can achieve sustainable growth. To this regard, Dougherty and Hardy (1996) and Utterback (1994) highlight the role of innovation as the mechanism by which organizations develop value through new products, processes, and systems that are needed to respond to challenging markets, technologies, and modes of competition. Likewise, Alvarez and Barney (2001) reveal that the importance of innovation is its direct link to competitiveness. Prahalad and Ramaswamy (2003) stress that the convergence of multiple discreet technologies and major changes in the competitive landscape are transforming the marketplace and, as a result, the potential for innovation is greater than ever. Therefore, failure to innovate is likely to reduce competitiveness, since innovation is the key to competitive advantage in a highly turbulent environment (Neely, & Hii, 1998).

O'Regan and Ghobadian (2005) enhances that existing studies on innovation focus largely on drivers of product development (Pavitt, 1990), such as creativity (Amabile et al., 1996), resources availability (Dougherty & Hardy, 1996), mergers, acquisitions, divestitures, downsizing, and cost reduction (Hitt et al., 1996), firm size (Acs, & Audretsch, 1988), and shorter product cycles using flexible manufacturing systems (Zenger, & Hesterly, 1997). According to Birkinshaw et al. (2008), scholars around the world have produced a vast body of academic research on innovation. Most of this research has focused on various aspects of innovation, such as technological innovation (Henderson & Clark, 1990; Utterback, 1994), process innovation (Pisano, 1996), service innovation (Gallouj, & Weinstein, 1997), strategic innovation (Hamel, 1998), and management innovation (Birkinshaw et al., 2008). Moreover, reviews indicate that the dominant perspective in the diffusion of innovation literature contains proinnovation biases which suggest that innovations and the diffusion of innovations will benefit adopters (Abrahamson, 1991).

Roberts (2007) posits innovation come in many forms: incremental or radical in degree; modifications of existing entities; development of entirely new entities; modification embodied in products, processes or services; oriented toward consumer, industrial or governmental use; based on various single or multiple technologies. As a result, there is a plethora of definitions and underlying subjects related to innovation. One of the subjects of particular interest relies on the drivers of innovation, as described next.

Innovation and innovation capability are similar tough different concepts. Asa et al. (2013) posit that it is essential to be aware of aspects that drive innovation for an organization in order to build innovation capability. Developing new innovation process consists of various intertwined variables that require its own set of capabilities. Competitive advantage could derive from this capability of a company to develop new products (Lawless, & Fischer, 1990). And this development of new products is attributable to accumulation of capabilities and therefore contributes to innovation outputs. In most circumstances, high performance companies would have stronger capabilities as compared to low performance firms (Yam et al., 2010). In this sense, Lall (1992) define innovation capability as the organizational skills and knowledge needed to effectively absorb, master and improve existing technologies, and to create new ones. Asa et al. (2013) define innovation capability as the attributes needed by a firm to support the innovation activity. These attributes provide a firm with the ability to quickly and successfully adopt new methods and processes, and develop and introduce new and improved products and services to compete more effectively in a rapidly changing environment. Lawson and Samson (2001) define innovation capability as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the company and its stakeholders. Fuchs, Mifflin, Miller, and Whitney (2000) propose innovation capability as a higher-order integration capability that is the ability to mold and manage multiple capabilities in the organization. Therefore, companies possessing the innovation capability have the ability to integrate key capabilities and resources to successfully stimulate innovation. The capacity to innovate is the ability of the company to adopt or implement new ideas, processes or products successfully and, as a result, firms with greater capacity to innovate are able to develop a competitive advantage and achieve higher levels of performance (Hurley, & Hult, 1998). Laswon and Samson (2001, p. 396) conclude that “the innovation capability construct has the potential to be developed to make a significant contribution furthering knowledge in the management of innovation.”

Nevertheless, there is no common definition on what exactly constitute the innovation capability of a company. Christensen (1995), for example, describes innovation capability in terms of assets science research, process, product innovation, and esthetics design. While describing innovation capability, Chiesa et al. (1996) focus on concept generation, process innovation, product development, technology acquisition, leadership, resourcing, systems, and tools. The characteristics of an organization that facilitates and supports its innovation strategies are a kind of special assets or resources that include technology, product, process, knowledge, experience and organization (Guan & Ma, 2003). Yam et al. (2010) use a functional approach that unfold innovation capability into learning capability, R&D capability, resource allocation capability, manufacturing capability, marketing capability, organization capability, and strategic planning capability. What studies have in common are (1) the recognition of innovation capability as an important source to outperform competitors and (2) the lack of a clear definition on what drivers, dimensions, or factors constitute the concept of innovation capability. Therefore, there is still room to develop a comprehensive understanding on the definition of innovation capabilities as a function of smaller units: not because the subject is under researched but because of absence of a common and accepted definition.

This is evidence that: (1) light on innovation as an organization practice has been shed more actively within the last couple of decades by both practitioners and academics and (2) innovation can emerge in various ways, and, therefore, drivers for innovation and the concept of innovation capability itself need to be identified and explained.

On the one hand, innovation is considered a key component for corporate competitiveness. On the other hand, this is still difficult to determine what exactly drives innovation to take place. For the purpose of this study, innovation capability is depicted in terms of drivers that propel innovation. In this context, four hypotheses are depicted to be tested in this study:

- Hypothesis 1: Innovation drivers would be not equally important for a company to innovate;
- Hypothesis 2: Innovation capability would derive from innovation drivers;
- Hypothesis 3: Innovation drivers would be not equally practiced in companies; and
- Hypothesis 4: Innovation drivers would show similarities regarding importance and practice.

1.2 Innovation and internationalization

Internationalization has been a growth alternative for companies that allows them to reach new markets, gain scale and scope economies, increase firm security and profitability. In the last two decades, the globalization of economies, especially the emerging ones, has promoted a new competitive reality, which is more uncompromising, enabling the creation and implementation of previously unimaginable business models. Companies' initiatives regarding internationalization have boosted the growth rate of foreign direct investment—FDI. In the late 1980s, the average annual growth had the value of about US$100 billion, while the 2000s witnessed an average annual growth of approximately US$600 billion, which represent a six-fold increase. More than 30 per cent of the global FDI value is currently invested in emerging economies, what stimulates their economic advancements (Prioste, & Yokomizo, 2012).

The authors argue that, over time, the relationship between FDI, international trade and innovation has become more interdependent. Firms with notable international operations are the ones that are leading overseas investment, participating in international trade and engaging in innovation. The most significant developments in innovation, especially those related to high technology, come from such firms. This fact renders cutting edge supremacy of these firms in highly global competitive markets.

Nevertheless, it is not easy for such firms to outperform rivals in foreign countries. Internationalization requires companies (1) to possess competences which can be transferred overseas; (2) to develop competitive advantages in their home country which can be used abroad; (3) to create new advantages facilitating their operations in foreign markets (Vasconcellos, 2008a) where they face global and local competitors.

The internationalization of Brazilian firms is of critical importance for the advancements of the national economy. However, the country still lacks government policies, institutional support and initiatives that would facilitate the internationalization of Brazilian firms (Fleury, & Fleury, 2011). Consequently, the number of international Brazilian firms is relatively small and their internationalization depends mostly on the persistence and efforts of the firms themselves.

Hence, although internationalization is a path that firms and countries should follow to increase their global competitiveness, enabling the process via the continuous creation of country and firm competitive advantages is a challenge to most emerging markets firms and governments. This is especially the case in countries that need to compensate for many initial disadvantages (Child, & Rodrigues, 2005) associated with firm capabilities and competences, the liability of foreignness and a late entry into the international business arena.

Brazil is considered a late mover within the globalization process and its participation in international markets is still very limited (Fleury, & Fleury, 2007). Nevertheless, a sound economy and a huge and growing market have shifted Brazil's role in the international battlefield from a poor third world country to a promising player. Evidence of this phenomenon is a growing number of Brazilian companies endeavoring initiatives abroad.

Relating internationalization and innovation, a handful of Emerging-Market Multinationals—EMMs—have begun to move some of their Research and Development—R&D—capabilities overseas to access established innovation centers. These activities are often driven by the desire to absorb knowledge and gain access to new markets, talent and expertise (Accenture, 2008).

Kafouros (2008) suggests that because innovations of firms with lower degree of internationalization are not marketed in many countries, the significant costs associated with the development of new technologies outweigh the potential benefits.

Caves (1982) argues that organizations that expanded to other countries received high economic payoff for their innovations because they can offer their products to a large number of potential buyers. Likewise, Lu and Beamish (2004) showed that firms can exploit full value when they deploy their products in many countries because of economies of scale. Whilst domestic firms cannot cover the high costs of innovation (Hitt et al., 1994), highly international firms can lower such costs by performing many activities internally and by applying their process innovations to many production sites (Kotabe et al., 2002).

Moreover, Hitt et al. (1994) suggest that internationalization and diversification allow MNEs to improve their innovative capability by employing the specific resources an advantages of different economies and by establishing alliances with local firms and universities (Santos, 2004).

Furthermore, the costs of developing new products and processes are lower for MNEs as they can buy R&D inputs from the cheapest available sources and locate their R&D departments in regions which are productive or in regions where the cost for resources—such as land, materials, workforce, and scientists—is low (Granstrand et al., 1993; Kotabe et al., 2002).

Nevertheless, although a high degree of internationalization may provide a firm with competitive advantage, not all multinationals can benefit from R&D. Kafouros (2008) highlights the following problems: (1) coordination and control of geographically dispersed R&D sites may increase innovation costs, (2) the unwitting dissemination of ideas and know-how from poorly-controlled departments—a severe scenario may include the spillover of a knowledge to rivals and other firms—, and (3) distance has a negative impact on the quality, frequency, and speed of communication, thereby raising the risk of misunderstandings (Fisch, 2003, von Zedtwitz, & Gassmann, 2002).

The growth strategy is always a combination of the product and market options–existing or new products in current or new markets. Although there is no single route to successful corporate growth, innovation and internationalization are often deemed as growth-seeking strategies (Kyläheiko et al., 2011).

On the one hand, ever since Schumpeter (1942), innovation-based growth has been regarded as a key strategy on both the firm and the industry level (Kafouros et al., 2008; Nelson & Winter, 1982). Firms embedded with strong R&D capabilities may pursue innovation-based growth more aggressively and continuously launch new products or services on the market.

On the other hand, internationalization is often recognized as a significant opportunity for growth and, therefore, value creation (Kyläheiko et al., 2011; Lu & Beamish, 2001; Buckley & Casson, 1976). Firms operating in small open economies with limited domestic markets are more likely to endeavor new markets, which seems not to be the Brazilian case. However, increasing costs of R&D–which is usually deemed as sunk costs incurred before any sales are made–drive firms to international markets, as increases of revenues are achieved only when a broader market is regarded.

Kyläiheiko et al. (2011) claim that both innovation and internationalization are based on the existing resources and capabilities and therefore it is natural to think they must be somehow interrelated. Saarenketo (2004) advocates that, in some high-tech industries, for a firm producing innovative products that have only a few (if any) potential domestic clients, internationalization is mandatory if it is to stay in business. Kafouros et al. (2008) highlight "… firms need to have a sufficient degree of internationalization, i.e., be active in many markets, to capture successfully the fruits of innovation. However, Kyläiheiko et al. (2011) conclude that internationalization is not necessary for all firms (at least not in the short run) that launch innovations and not all internationalized firms are necessary very innovative (at least not in terms of new product launches).

To this regards, papers measuring the effects of innovation on internationalization are still scarce. This is especially true when it comes to quantitative approaches. In order to fulfill this gap, this study provides a quantitative approach on the relations between innovation and internationalization. Therefore, other two hypotheses are depicted to be tested in this study:

- Hypothesis 5: Innovation would have positive effects on internationalization; and
- Hypothesis 6: Innovation capability would have positive effects on internationalization.

1.3 Innovation and business performance

The definition of innovation quite often includes the concepts of novelty, commercialization, and implementation. It means that if an idea has not been developed and transformed into a product, process, service, or it has not been put into market, it would not be classified as an innovation (Popadiuk, & Choo, 2006). Urabe (1988) proposes that innovation consists of the generation of new idea and its implementation into a new product, process or service, leading to a creation of pure profit for the innovative business enterprise. While invention is an idea, a sketch, or a model for a new or improved device, product, process, or system, innovation, in the economic sense, is accomplished only with the first commercial transaction involving the new product, process, system, or device (Freeman, 1982).

Similarly, Roberts (2007) proposes innovation as a composition of two parts: (1) the generation of an idea—or invention—, and (2) the conversion of that idea into a business or other useful application. In other words, innovation is the invention and the exploitation of such invention in the marketplace. The invention process covers all efforts aimed at creating new ideas and getting them to work. The exploitation process includes all stages of commercial development, application, transfer, broad-based utilization, dissemination, and diffusion.

Drucker (1985) advocates systematic innovation consists in the purposeful and organized search for changes, and in the systematic analysis of the opportunities such changes might offer for economic or social innovation.

According to Kafouros (2008), innovation provides a firm with increased performance through two impacts: one is direct and the other is indirect. Direct impacts include product and process innovation. Product innovation provides higher sales and market share while process innovation results in lower production costs, higher profits and sales. Indirect impacts include increased absorptive capacity, learning, innovative culture, and dynamic capabilities.

Lawson and Samson (2001, p. 396) highlight this literature gap: "further progress will be made in unlocking and analyzing the complexities of organizational innovation processes, and the business performance that results."

Although studies have stressed the importance of organization innovation capabilities (Yam et al., 2004, Galende & Fuente, 2003, Bougrain & Haudeville, 2002, Danneels, 2002), different researchers pinpoint different capabilities as major determinants of innovation performance. Teece (1996), for example, enhances innovation as an interactive process characterized by technological interrelatedness between subsystems. Evangelista et al. (1997) claim the central component of innovation regards R&D activities and therefore they deserve the most important intangible innovation expenditures. Danneels (2002) promotes the customer competence and the technological competence as important factors to nourish product innovation. Galende and Fuente (2003) advocate these items to have positive impacts on innovation: commercial resources, organizational resources and internationalization. In this context, a comprehensive study on the relations between innovation capability and business performance still needs further exploration. This study is an attempt to fulfill this gap and therefore directs suggestions companies can implement in order to foster innovation capability effectively.

To this regard, although literature is plenty of papers addressing the relations between innovation and business performance, it is still scarce the number and the depth of papers that quantitatively measure the effects of innovation on business performance. In this context, this study is an attempt to provide a more quantitative approach and provide a set of innovation drivers that most influence business performance.

Finally, the two last hypotheses are depicted to be tested in this study:

- Hypothesis 7: Innovation would have positive effects on business performance; and
- Hypothesis 8: Innovation capability would have positive effects on business performance.

1.4 Objectives

In this context, this study aimed at (1) describing the relations between innovation and internationalization of companies operating in Brazil and (2) describing the relations between innovation and business performance of companies operating in Brazil.

Such general goals were unfolded into eight specific goals, SG, as follows:

- SG1: Identifying the most important innovation drivers;
- SG2: Proposing a measurable construct for the innovation capability of a company;
- SG3: Identifying the most practiced innovation drivers; and
- SG4: Describing the gaps between the importance and the practice of innovation drivers.
- SG5: Describing the relations between innovation drivers and internationalization degree;
- SG6: Describing the relations between innovation capability and internationalization degree;
- SG7: Describing the relations between innovation drivers and business performance; and

- SG8: Describing the relations between innovation capability and business performance.

Innovation, innovation capability, internationalization degree, and business performance are at a conceptual level thus measuring them imply adopting both an adequate scale and a feasible means by which data can be collected. In this sense, 'importance of innovation drivers' and 'practice of innovation drivers' are measured through the perception of the respondent about these subjects. This is a clear limitation of this study, but the most suitable solution for the purposes of data access and collection.

1.5 Potential contributions of this dissertation

This dissertation aimed at providing a useful framework for academics to conduct future research about innovation capability. Such framework unfolds the concept of innovation capability into 21 individual innovation drivers. Moreover, a scale to measure innovation drivers is provided.

This dissertation aimed at providing practitioners with recommendations on what to prioritize when enhancing innovation, internationalization, and business performance. Results show that different outcomes require excellence at different sets of innovation drivers. These are tools that managers may use to boost the competitiveness of their firms and eventually outperform competitors.

1.6 Structure of this dissertation

This dissertation is structured in five chapters. This first chapter contains an overview of (1) innovation capability, (2) the relations between innovation and internationalization, and (3) the relations between innovation and business performance. For these three subjects, clear literature gaps were depicted and such gaps provided the study with the foundations to support a research. As a result, eight hypotheses were detailed and they guided the all coming efforts. At the very end of this chapter, the main goal and specific goals were unveiled.

The second chapter included an extensive literature review. Main subjects encompassed innovation, innovation capability, the relations between innovation and internationalization, and the relations between innovation and business performance. At the end of the chapter, the gaps in the literature are presented and a conceptual model for defining innovation capability was proposed. This conceptual model was employed to drive the construction of the questionnaire, the conduction of the field research, the presentation of results, and the development of analyzes.

The third chapter provides the reader with expanded methodological procedures. The first step was to generate a questionnaire in rapport with the conceptual model depicted in the previous chapter. The second step was to conduct the field research itself. A quantitative approach was adopted to test the proposed hypotheses. The use of different and complementary statistical techniques was necessary. They embraced techniques as diverse as comparison of means of non-parametric variables, factor analysis, cluster analysis, and linear regressions.

The fourth chapter presented the results and the consequent analysis, based on the conceptual model depicted in chapter two and in accordance with the methodological procedures thoroughly detailed in chapter three.

The fifth chapter encompasses (1) final considerations, (2) main contributions to academics and practitioners, (3) study limitations, and (4) pathways for future research.

References used for the purposes of this study are shown at the end of this document. One annex and a variety of appendices compose the final part of this dissertation.

2 LITERATURE REVIEW

According to the goals of this study, this literature review encompasses these main subjects: innovation and internationalization. After providing the reader with a deep understanding on the concepts of innovation, this literature review discusses the concepts of innovation capability and the underlying drivers that constitute it. A comprehensive conceptual model is proposed by the end of the chapter. To the regard of internationalization, internationalization models, the concept of internationalization degree, and the relations between innovation and internationalization are explored.

2.1 Innovation

A long discussion on the definition of innovation still takes place in the literature. For example, Linder et al. (2003) defines innovation as “implementing new ideas that create value.” Creation of value refers to the various forms that innovation can take place, such as product development, the development of new processes technologies or innovative management practices (Zott, 2003; Glynn, 1996). Neely and Hii (1998) suggest innovation is a multi-dimensional phenomenon that is both complex and context-specific.

The definition of innovation quite often includes the concepts of novelty, commercialization, and implementation. It means that if an idea has not been developed and transformed into a product, process, service, or it has not been put into market, it would not be classified as an innovation (Popadiuk, & Choo, 2006). Urabe (1988) proposes that innovation consists of the generation of new idea and its implementation into a new product, process or service, leading to a creation of pure profit for the innovative business enterprise. While invention is an idea, a sketch, or a model for a new or improved device, product, process, or system, innovation, in the economic sense, is accomplished only with the first commercial transaction involving the new product, process, system, or device (Freeman, 1982).

Similarly, Roberts (2007) proposes innovation as a composition of two parts: (1) the generation of an idea—or invention—, and (2) the conversion of that idea into a business or other useful application. In other words, innovation is the invention and the exploitation of such invention in the marketplace. The invention process covers all efforts aimed at creating new ideas and getting them to work. The exploitation process includes all stages of commercial development, application, transfer, broad-based utilization, dissemination, and diffusion.

Drucker (1985) advocates systematic innovation consists in the purposeful and organized search for changes, and in the systematic analysis of the opportunities such changes might offer for economic or social innovation.

Table 1 provides a summary of types of innovation.

Table 1 - Types of innovation: a summary

Type of innovation	Feature of innovation
Product or service innovation	New or improved product, equipment, or service that is successful on the market.
Process innovation	Adoption of a new or improved manufacturing or distribution process, or a new method of social service.
Organizational innovation	More effective utilization of human resources, which are crucial to the successful exploitation of ideas.

Neely and Hii (1998) shed important light on diffusion of an innovation. Diffusion is the way in which innovations spread, through market or non-market channels. Without diffusion, an innovation will have no economic impact (OECD, 1992). Elements of the diffusion process include: (1) the innovation itself—the greater the improvement that the innovation brings to the users, the greater the rate of diffusion, and the lower the cost of the innovation, the faster the rate of diffusion—, (2) the population of potential adopters, (3) their decision-making process, and (4) the flow of information concerning the innovation between the manufacturers and the adopter. Compatibility of innovation with current values and past experiences will also affect the diffusion rate.

According to Kafouros (2008), innovation provides a firm with increased performance through two impacts: one is direct and the other is indirect. Direct impacts include product and process innovation. Product innovation provides higher sales and market share while process innovation results in lower production costs, higher profits and sales. Indirect impacts include increased absorptive capacity, learning, innovative culture, and dynamic capabilities.

2.1.1 Innovation models

The development of innovation models is often divided into generations (Berkhout et al., 2006; Miller, 2001; Liyanage et al., 1999; Rothwell, 1994). The first generation—1G—is the traditional linear model in which innovation is represented by a pipeline of sequential activities, which starts at pure scientific research and ends with late commercial applications. As the 1G model incorporates market information very late in the process, commercial applications are often merely technical inventions. This is the reason it is also named the technology-push model, where the key input is research and development—R&D—(Neely, & Hii, 1998).

The second generation—2G—models focused on the flow of information originating from the market, essentially reversing the linear pipeline of the first generation. Science is replaced by the market as the source of innovation, and processes are still largely a set of sequential steps. 2G models emphasize market-driven improvements of existing products, resulting in a large variety of short-term projects. Customer needs were seen to be driving the innovation process, hence this is the so-called the market-pull model (Neely, & Hii, 1998).

The third generation—3G—models show less linearity owing to feedback paths in the chain. Berkhout et al. (2006) advocate third generation models can be seen as open R&D models, emphasizing product and process innovation—which are technical—, and neglecting organizational and market innovation—which are non-technical. Therefore, third generation innovation models tend to focus on the company’s new technological capabilities rather than including solutions for meeting institutional barriers and societal needs. This is the coupling model. Rothwell and Zegveld (1985, p. 50) describe the innovation process as “a complex net of communications paths, both intra-organizational and extra-organizational, linking together the various in-house functions and linking the firms to the broader scientific and technological community and to the marketplace.”

Accordingly, some advocate in favor of non-linearity in the innovation process even if it is experimental, chaotic, and difficult to plan and unpredictable. Buijs (2003, p. 91) posits that visualizing the innovation process as a circular model suggests that “there is neither beginning nor end, which is true in the sense that after introducing a new product on the market as a result of a product innovation process, the successful use of this product will lead to reactions of competitors, for instance by introducing their new, and better performing products. This in turn will cause the original innovating company to start the next new product innovation process to regain its competitive advantage”.

The fourth generation—4G—model is also named the integrated model, because of its integrative and parallel nature. The previous discussion suggests that innovation process is complex, non-linear and requires feedback. There is high level of functional integration and parallel activities across functions, whereby information sharing in the form of joint meetings across functions is commonplace. As a result, 4G model promotes parallel cross-functional development and more effective process. Figure 1 provides an example of the cross functional and integrated nature of the 4G innovation process model (Neely, & Hii, 1998).

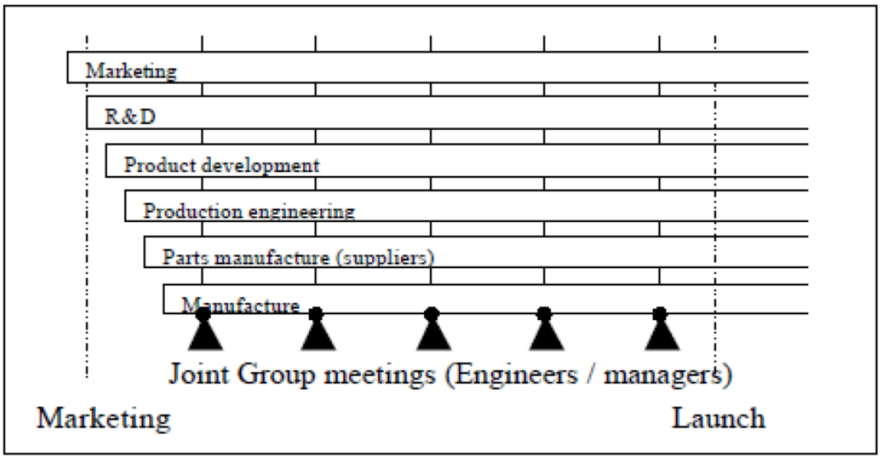

Figure 1 - The cross-functional and integrated nature of the 4G innovation process model

According to Neely and Hii (1998), the fifth generation—5G—model is also named the systems integration and networking—SIN—, because the innovation processes resemble that of networking processes and this is the result of several key trends, such as increasing number of international strategic alliances and collaborative R&D relationships, the increasing awareness of supply chain management, networking relationships, of small and medium enterprises—SMEs—with large firms and among small firms. Berkhout et al. (2006) named this generation[1] as the cyclic innovation model—CIM—because it complies with the principles of system dynamics. It means that equilibrium processes have been replaced by processes of change. Therefore, CIM focuses on the interaction between changes of the involved subsystems without the need for a full scientific description of the system at one

[1] Berkhout *et al.* (2006) refer to this generation as the fourth generation, although the characteristics described in their fourth generation is convergent to those of other authors’ fifth generation. Therefore, this work will refer to both as the fifth generation.

specific moment in time. Models must include feedback paths so that adaptive steering and learning processes can be made more explicit. Figure 2, as follows, presents a system model showing the fundaments of the innovation economy: a circle of mutually influencing dynamics processes. In the model, changes in Science (left), in Industry (right), in Technology (top) and markets (bottom) are cyclically interconnected. The central role of entrepreneurship is worth. Studies looking at the significance of geographical location to innovative capacity have identified networking as the key element in enhancing the innovative potential of firms.

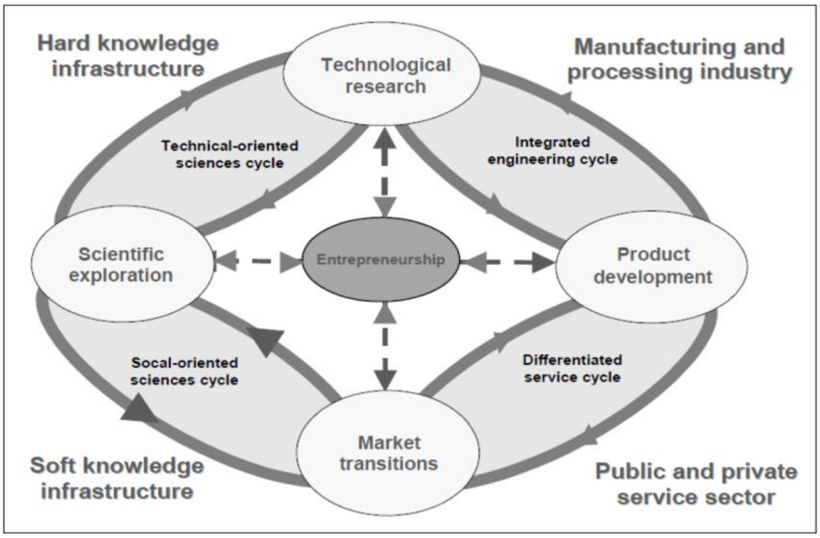

Figure 2 - Fifth generation innovation circle of change
Source: Berkhout et al. (2006).

Berkhout et al. (2006) highlight that an important consequence of the fourth generation model is the cyclic nature of networks, which require multi-partnerships that can start fast, adapt fast and learn fast.

Buijs (2003) claims that during the development of modeling product innovation processes and its use in education and research, discussions were about the number of stages, the names of the stages, the activities within those stages, and the reasoning behind this division. Such divisions can be based on both activities and departments.

Table 2, next, provides a comparison between the five innovation process model, stressing main features and criticism for each one.

Table 2 - Innovation process models: a comparison

Innovation process model	Main features	Criticism
First generation innovation process model: technology-push model	The key input to the innovation process is R&D.	(1) the process is portrayed as a series of watertight stages, (2) too much emphasis is placed on R&D and other inputs are left in the background, and (3) absence of feedback paths.
Second generation innovation process model: market-pull model	The key input to the innovation process is customer needs.	(1) the process is portrayed as a series of watertight stages, (2) too much emphasis is placed on market needs and other inputs are left in the background, and (3) absence of feedback paths.
Third generation innovation process model: technology and market coupling model	Importance of feedback, where communications paths link the internal functions of a firm to the external knowledge pool of the scientific community	Innovation process remains sequential. Product and process innovation are privileged in detriment of organizational and market innovation. Therefore, solutions meeting institutional barriers and societal needs are neglected.
Fourth generation innovation process model: integrated model	Promotion of parallel cross-functional development and more effective overall integration, which leads to higher information processing efficiency.	Lack of the concept of the systemic approach, in which the firm is part of more complex network. The interaction with other nodes of the network would allow the firm to have comprehensive knowledge sharing.
Fifth generation innovation process model: systems integration and networking	Networking as the key element in enhancing the innovative potential of firms	Coordination and control costs increase.

Source: based on Neely and Hii (1998) and Berkhout et al. (2006).

Roberts and Frohman (1978) propose a process view of how technological innovation occurs, with emphasis on two key generalizations. First, technological innovation is a multi-stage process with significant variations in the managerial issues and effective management practice occurring among these stages. Figure 3, as follows, portrays an example of six stages of this process view of how technological innovation occurs. For simplicity sake, no feedback loops are printed in Figure 3, from later stages back to earlier ones. Kline (1985) highlights that the multiple feedback loops are the essence of the innovation process.

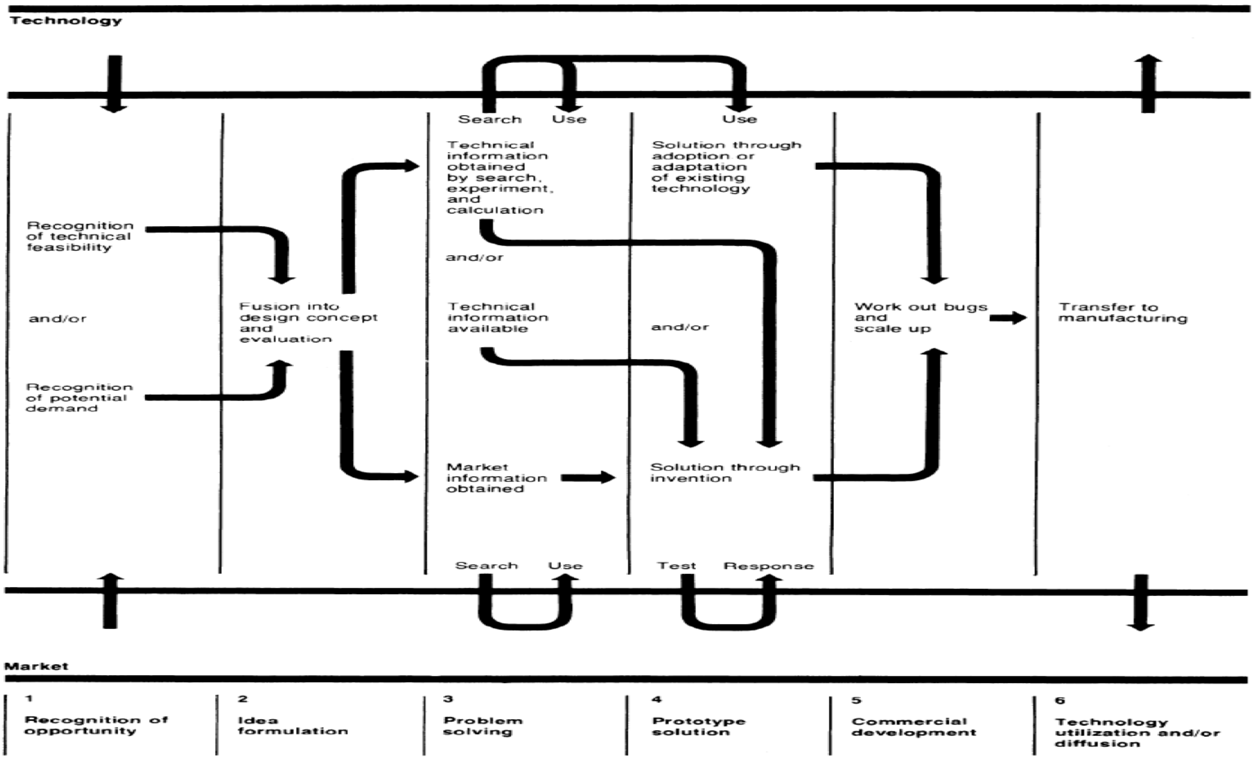

Figure 3 - Multi-stage technological innovation process
Source: Roberts and Frohman (1978).

Roberts (2007) highlight the precise number of stages and their divisions are somewhat arbitrary. The second generalization is that innovation occurs through technical efforts carried out primarily within an internal organizational context. However, it involves heavy interaction with the external technological and market environment. In this sense, proactive search for technical and market inputs, and receptivity to information sensed from external sources are critical to innovate.

Kafouros (2008) provides a division based on activities, as shown in Table 3, as follows.

Table 3 - Kafouros' R&D process

Stages	Description
Conceptualization	The initial concept of the project is formulated
Research	Collection of scientific information required for the project
Technology creation	New knowledge, technological options and components are created
Design	Design possible versions of the product
Prototyping	The first prototypes are created, debugged and tested
Development	The final product design is fine-tuned and implemented
Commercialization	The new product is introduced to market

Source: Kafouros (2008, p. 16).

Saren (1984) provides examples based on both departments and activities, as shown, respectively, in Figures 4 and 5, as follows.

Figure 4 - Department-based view of product innovation process
Source: Saren (1984).

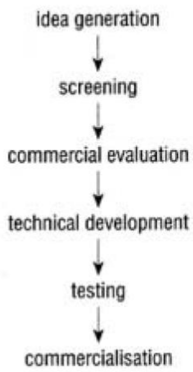

Figure 5 - Activity-based view of product innovation process
Source: Saren (1984).

An evolution of the concept included the idea (1) that product design has to fit within the corporate strategy of a company and (2) that the engineering and commercial worlds would have to be merged. Archer (1971) proposes an innovation process encompassing ten stages: (1) policy formulation (refers to the strategic planning of the company); (2) preliminary research; (3) feasibility study; (4) design development; (5) prototype development; (6) trading study; (7) production development; (8) product planning; (9) tooling and marketing preparation; and (10) production and sale. Roozenburg and Eekels (1995) summarize Archer's concept into four stages: (1) policy formulation, which results in a product policy; (2) idea finding, which results in a new business idea; (3) strict development, in which three parallel processes take place: (a) product designing; (b) marketing planning; and (c) product development; and (4) realization, in which three processes take place: (a) production, (b) distribution and sale, and (c) use. The relations between stages are presented in Figure 6, as follows.

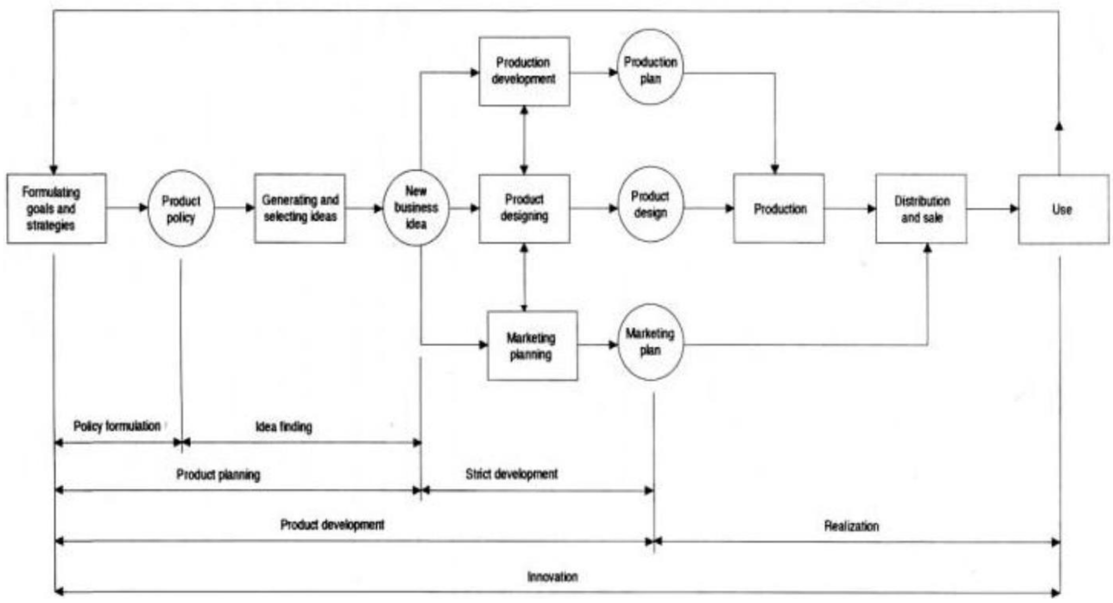

Figure 6 - The product innovation process according to Roozenburg and Eekels
Source: Roozenburg and Eekels (1995).

Buijs (2003) proposes a four-stage product innovation model that encompasses (1) strategy formulation, (2) design brief formulation, (3) product development, and (4) product launch and use. Bringing contributions from psychology and learning, the author claims this model proved to be an excellent instrument, not only to select team members, but also as an instrument and a language to better discuss problems inside less well performing innovation teams.

Roberts (2007) posits that external technology is significant to effective innovation. Success heavily depends on awareness of customer needs and competitor activity. To this regard, Afuah (1988) classifies innovation according to technological, market, and organizational characteristics: while technological and market innovations are related to external factors, organizational innovation is more related to internal factors.

While studying biotech firms, which operate amid uncertainty and rapid change, Khilji et al. (2006) proposed the innovation management model that encompasses science and technology, market forces, and organizational capabilities. Special attention was drawn to funding and financing, establishing and maintaining alliances, and registering patents. Figure 7, next, presents Khilji et al.'s (2006) model for biotech firms.

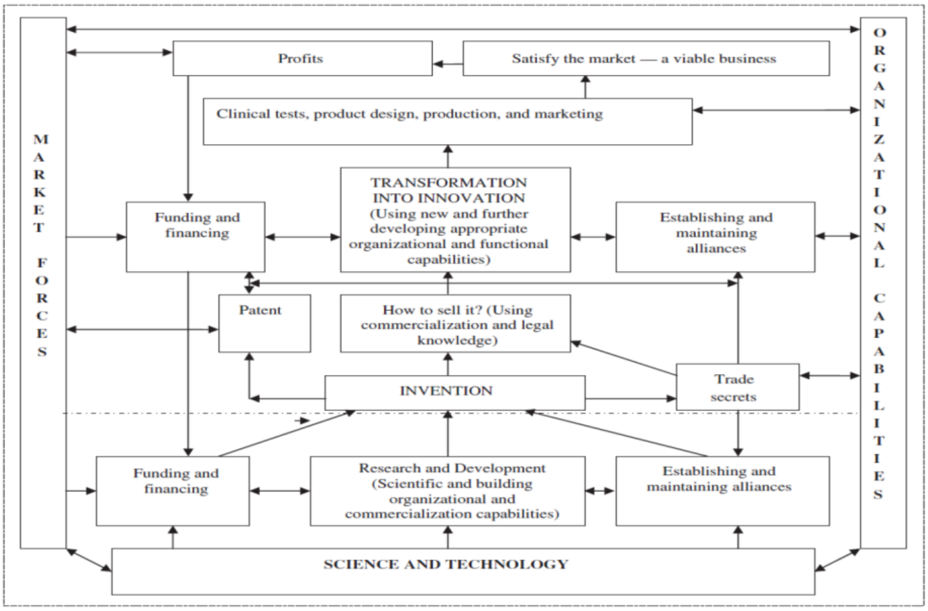

Figure 7 - The model of biotech innovation management
Source: Khilji et al. (2006).

2.1.2 Innovation capability

The resourced-based view—RBV—stresses that a precondition for a company to generate sustainably high rates of return is that it should possess a range of resources and that it is able to combine such resources to create a series of capabilities. These capabilities are valued by customers as rare, and difficult to imitate (Barney, 1991; Peteraf, 1993; Rugman, & Verbeke, 2004). On the other hand, capabilities are dynamic processes, specific to the firm and dependent on its trajectory, difficult to copy, and are accumulated as the result of a process of continuous learning (Nelson, & Winter, 1982).

Innovation capability—as a proxy for innovation—is important for a firm to compete. However, innovation capability has many dimensions or components which draw on a wide range of aspects such as resources, assets, and abilities (Sen, & Egelhoff, 2000). These dimensions vary from organization to another for different circumstances. Albeit circumstance-specific aspects, there are certain dimensions that feature more prominently in the literature that appears to be the base or minimum requirements for enabling innovation in an organization (Asa et al., 2013).

Lawson and Samson (2001) define innovation capability as the ability of high-performing innovators to achieve effective performance. The notion of capability is useful to apply to innovation as it is the capability to innovate that creates the potential for firm-wide behaviors leading to systematic innovation activities within the firm. Organizations that consciously and explicitly develop and invest in these aspects of innovation capability, individually and collectively, have a higher likelihood of achieving sustainable innovation outcomes as the engine of their business performance.

When the literature focuses on the ability of a firm to innovate, innovative capability is often cited and this will be term applied for the purposes of this study, although some authors prefer the term innovative capacity. Neely and Hii (1998) claim that the innovation literature does not provide an extensive coverage of the concept of innovative capacity. There is an issue of inconsistent semantics in relation to the concept. The terms innovative ability, innovative capability, innovative competence and absorptive capacity seems to all relate to the same concept of innovative capability. For the purposes of this work, innovation capacity and innovation capabilities are treated as synonym, and they mean the social construction of entities that evolve over time and that combine and allocate resources aiming at resolving a specific kind of problem: how to innovate timely and consistently. In other words, innovative capability is the potential of a firm to generate innovative outputs and its relation to innovation outputs is direct.

For instance, Cohen and Levinthal (1990) affirm the ability of a firm to recognize the value of new external information, assimilate it and apply it to commercial ends is critical to its innovative capabilities. Higgins (1995, p. 34-35) posits “if firms are to survive and prosper in the 21st century, they must assess their innovative capabilities and take strategic action to improve their innovation skills.”

Although innovation can improve a company’s competitiveness, it still requires a set of different managerial knowledge and skills than that used in running the firm’s day-to-day operations (Tidd, 2001). Marotti-de-Mello et al. (2008) name this set of knowledge and managerial skills as innovative capacity, which is the internal potential to generate new ideas, identify new market opportunities, and implement marketable innovations through exploration and exploitation of the company’s existing resources and capabilities.

Innovative capability is key for a company’s competitiveness in the current global scenario to flourish and it is related to how the company should be organized and managed to develop products, services, and processes that actually offer sustainable competitive advantages over time (Marotti-de-Mello et al., 2008).

Kafouros (2008) argues that there are numerous factors that allow an organization to successfully benefit from innovations and such factors are grouped into two categories: innovative capability—originally named innovative capacity—and degree of appropriability. Innovative capability refers to the ability a firm has to develop and employ innovations and new technologies. Firms must ensure that they can capture and create scientific knowledge more rapidly and effectively than their rivals. As a result, the firm will experience better cost, time, and quality. Degree of appropriability is influenced by factors that affect the capability of a multinational enterprise—MNE— to exploit, protect, and appropriate the firm's stock of scientific knowledge more successfully. Organizations that undertake R&D are rarely able to appropriate all the benefits of their research efforts.

Accordingly, the innovation capability can be understood as overcoming barriers that hamper the ability to innovation. In this regards, Neely and Hii (1998) suggest there are many barriers to innovation and that these are both internal and external to a firm. External barriers include the lack of infrastructure, deficiencies in education and training systems, inappropriate legislation, an overall neglect and misuse of talents in society. Some major internal barriers include rigid organizational arrangements and procedures, hierarchical and formal communication structures, conservatism, conformity and lack of vision, resistance to change, and lack of motivation and risk-avoiding attitudes.

Papaconstantinou (1997, p. 6) spells out the factors that influence innovative capability of a firm:

> "The capacity of firms to innovate depends on a multitude of factors, not least the efforts they make to create new products or improve production processes, the extent of skills in their work force, their ability to learn, and the general environment within which they operate."

The innovative capability of a firm can be thought of as a potential of that firm to generate innovative output; this potential is dependent on the synergetic interrelationships of the culture of the firm, internal processes and external environment, as presented in Figure 8, as follows.

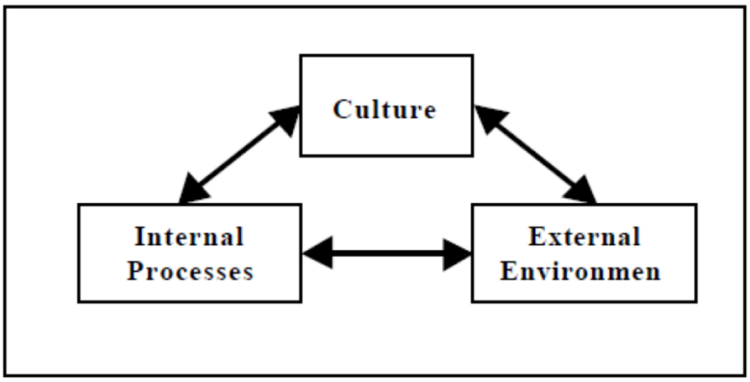

Figure 8 - The dimensions of innovative capability
Source: Neely and Hii (1998).

Christensen and Overdorf's (2000) proposition is quite similar to that of Neely and Hii's dimensions of innovative capability. It regards three factors that affect what an organization can and cannot do: its resources, its processes, and its values.

Table 4 - Factors affecting a company

Factor	**Definition**	**Relation to innovation**
Resources	Resources include both tangible ones like people, equipment, technologies, and cash, and the less tangible ones like product design, information, brands, and relationship with suppliers, distributors, and customers.	Access to abundant, high-quality resources increases an organization's chances of coping with change.
Processes	Processes are patterns of interaction, coordination, communication, and decision making employees use to transform resources into products and services of greater worth. Some processes are formal—explicitly defined and documented—thus they tend to be more visible. Others are informal: they are routines or ways of working that evolve over time, thus they tend to be less visible.	The most important capabilities and concurrent disabilities are not necessarily embodied in the most visible processes. In fact, they are more likely to be in the less visible, background processes that support decisions about where to invest resources.
Values	Values are standards by which employees at every level set priorities that enable them to prioritize decisions. A key metric of good management is whether such clear, consistent values have permeated the organization.	The inexorable evolution of these two values—the way a company judges acceptable gross margins and to how big a business opportunity has to be before it can be interesting—is what makes companies progressively less capable of addressing disruptive change successfully.

Source: adapted from Christensen and Overdorf (2000).

These factors (Table 4) will guide managers to think of what sorts of innovation their organization will be able to embrace: they need to assess how each of these factors might affect their organization's capability to change.

Christensen and Oversorf (2000) also advocate that in the start-ups stages of an organization, much of what get done is attributable to resources—people, in particular. Over time, however, the locus of an organization's capabilities shifts toward its processes and values. Eventually, they migrate to culture, which is powerful management tool that enables employees to act autonomously but causes them to act consistently.

Abrahamson (1991) draws our attention to the existence of processes which prompt the adoption of efficient innovations and such processes may coexist with processes that prompt the adoption of inefficient ones. This is to say that not necessarily all resulting innovations are good for the company.

Successful companies, no matter what the sources of their capabilities, are pretty good at responding to evolutionary changes in their markets, but they run into trouble while handling or initiating revolutionary changes in their markets, or dealing with disruptive innovation (Christensen, & Overdorf, 2000).

Furthermore, Roberts (2007) proposes three dimensions from which innovations arise: (1) staffing, (2) structure, and (3) strategy. First, staffing considerations regard what kinds of people need to be involved for effective development, and what managerial actions can be taken to maximize their overall productivity. Critical innovation roles include: idea generators, entrepreneurs—or product champion—, program manager—or leader—, gatekeepers, and sponsor—or coach. Second, the design of organization structures that will enhance technological innovation requires focusing on both the organization's inputs—market and technical—and outputs. The author advocates by placing input and output in the same group, under a single leader, all the contributors towards a given objective, the project organization maximizes coordination and control in order to achieve output goals. Third, strategic management of technology includes both strategic planning and implementation at either of two levels: (1) overall, for example, the entire technology-dependent firm; and (2) more focused, for example, the technology development.

Yam et al. (2010, p. 1010) unfold innovation capability into seven innovation capability dimensions, described as follows:

- Learning capability: a company's ability to identify, assimilate, and exploit knowledge from the environment;
- R&D capability: a company's ability to integrate R&D strategy, project implementation, project portfolio management, and R&D expenditure;
- Resources allocation capability: a company's ability to ensure that there are enough capital, professionals, and technology in the innovation process;
- Manufacturing capability: a company's ability to transform R&D results into products, which meets market needs, accords with design request and can be manufactured in batches;
- Marketing capability: a company's ability to publicize and sell products on the basis of understanding consumer needs, competition situation, costs and benefits, and the acceptance of innovation;
- Organizing capability: a company's ability to secure organizational mechanism and harmony, cultivate organization culture, and adopt good management practices; and
- Strategic planning capability: a company's ability to identify internal strengths and weaknesses, and external opportunities and threats, formulate plans in accordance with corporate vision and missions, and acclimatize the plans to implementation.

2.1.1.1 Resources as innovation driver

Asa et al. (2013) concludes that adequate resources and skills positively impact innovation capability. To this regard, Hurley and Hult (1998) also proposed that companies that have adequate resources have a greater capacity to innovate. The positive effect of resources as attribute for innovation capability supports prior research on innovation capability. For example, Wernerfelt (1984) suggests that differences in the innovative performance of a company results primarily from resource heterogeneity across companies. Irwin et al. (1998) used the RBV approach to show the positive relationship between organizational resources and organizational innovation characteristics of rarity, value, and inimitability. Therefore, resources and the right skill mix are important in building innovation capability: adequate resources with right skills to utilize the resources innovatively or economically are necessary for an organization embarking on developing innovation capability to achieve competitiveness (Asa et al., 2013).

‘Resources’ is a very wide term in this sense, but Christensen (1997) maintained that successful innovation requires four types of resources: personnel resources (manpower), material resources (physical and financial means), conceptual resources (knowledge and skill), and time resources (for transition and experimentation).

Resources are the—tangible and intangible—productive assets possessed or controlled by an organization or to which it has semi-permanent access and which it uses to develop its strategies (Helfat, & Peteraf, 2003). Amit and Schoemaker (1993) define resources as the assets of the firm whereas capabilities refer to the ability to exploit and combine resources by employing organizational routines to fulfill a goal. The difference between capabilities and assets relies on the fact that the former cannot be acquired directly in the market, but are, instead, the accumulated result of a particular series of activities (Dierickx, & Cool, 1989). In other words, the distinction may be established in terms of the difference between ‘having’ and ‘doing’, and the link with tangible and intangible concepts are clear.

Leaders must make sure the right skill mix is aligned with adequate resources; it’s a factor that needs concrete consideration. Abundance of resources without right skilled people to utilize those resources effectively and efficiently does not have any positive impact on innovation (Asa et al., 2013). Successfully mobilizing resources requires the support of key individuals at various stages of the innovation process to act as technological gatekeepers, business innovators or organizational sponsors (Tidd et al., 1997).

Effective resource management helps increase the number of innovation initiatives and improves the probability of stimulating innovation. As firms successfully manage innovation, they accumulate experience and learning, supporting still further improvements (Lawson, & Samson, 2001).

Innovative firms employ a variety of funding channels to encourage risk taking and entrepreneurship (Lawson, & Samson, 2001).

Competitive strength of industrial organizations resides in their learned organizational capabilities, which emerge from the interaction between the physical structure and human skills (Chandler, 1980). On the other hand, Helfat and Peteraf (2003) define an organizational capability as the ability of an organization to use resources in order to implement a set of coordinated tasks aimed at achieving a particular objective. Dávila (2010) summarizes capability characteristics as:

- Capabilities are socially constructed entities that represent a collective shared means of resolving problems (Cyert, & March, 1963);
- Both capabilities and resources evolve over time through a learning process, with the result that they possess an intrinsic dynamic component (Helfat, & Peteraf, 2003); and
- Capabilities represent a distinctive and superior way of combining and allocating resources.

Schreyogg and Kliesch-Ebert (2007) highlight that organizational capabilities have three main characteristics: (1) they represent an effective solution to complex problems, (2) they are exercised habitually and successfully, and (3) they are reliable as they have been developed over time.

The management of technology is crucial to today’s organizations. The shift toward external networks and leveraging the entire corporate knowledge base has meant we are more concerned with the management of technology within the overall organization, rather than research and development *per se* (Fusfeld, 1995). A number of authors have developed “technological competence audits” allowing firms to assess their technological capabilities, needs and possibilities against overall business objectives (Bessant, 1994; Coombs, 1994). Innovative firms are able to link their core technology strategies, with innovation strategy and business strategy. This alignment generates a powerful mechanism for competitive advantage. Roberts (2001) found that the effectiveness of the linkage between technological strategy and business strategy was a major determinant of R&D performance.

Effective forecasting helps organizations to identify future developments in technologies, products and markets, generate more refined information, reorient the company to avoid threats or grasp new opportunities and to improve operational decision making (Burgelman, & Maidique, 1988).

Innovators need sanctioned time to think, or “creative slack”. Often managers and employees are caught up in short-term operational challenges and do not have time for “blue-sky” thinking. Organizations can institutionalize a little innovation by providing employees with time, funding, facilities and a creative environment (Lawson, & Samson, 2001).

Asa et al. (2013) stress the importance of information and knowledge sharing to build and enhance innovation capability.

Table 5 – Innovation drivers for resources innovation dimension

Innovation dimension	Innovation driver	Concept	Reference
Resources	People	Personnel resources, manpower	Christensen and Overdorf (2000), Christensen (1997)
	Technologies	Material resources, physical means	Roberts (2001), Christensen and Overdorf (2000), Christensen (1997)
	Funding	Financial means	Lawson and Samson (2001), Christensen and Overdorf (2000), Christensen (1997)
	Time	Time resources (for transition and experimentation)	
	Intellectual capital	Conceptual resources (knowledge and skill)	Asa et al. (2013), Lawson and Samson (2001), Christensen and Overdorf (2000), Christensen (1997)

2.1.1.2 Process as innovation driver

Innovation tools and processes in place positively influence the key innovation activities. Process innovation can and should happen at various levels within the organization as no organization can depend solely upon innovation occurring at one level only. Successful organizations have an innovation process working its way through all levels of the organization (Asa et al., 2013).

The innovation value chain proposed by Hansen and Birkinshaw (2007) offers a comprehensive framework for managers to take an end-to-end view of their innovation efforts, pinpoint their particular weaknesses, and tailor innovation best practices as appropriate to address the deficiencies. It breaks innovation down into three phases—idea generation, conversion, and diffusion—and six critical activities—internal, cross-unit, and external sourcing; idea selection and development; and spread of the idea—performed across those phases. Figure 9 provides a pictorial representation of Hansen and Birkinshaw's innovation value chain.

	IDEA GENERATION			CONVERSION		DIFFUSION
	IN-HOUSE Creation within a unit	CROSS-POLLINATION Collaboration across units	EXTERNAL Collaboration with parties outside the firm	SELECTION Screening and initial funding	DEVELOPMENT Movement from idea to first result	SPREAD Dissemination across the organization
KEY QUESTIONS	Do people in our unit create good ideas on their own?	Do we create good ideas by working across the company?	Do we source enough good ideas from outside the firm?	Are we good at screening and funding new ideas?	Are we good at turning ideas into viable products, businesses, and best practices?	Are we good at diffusing developed ideas across the company?
KEY PERFORMANCE INDICATORS	Number of high-quality ideas generated within a unit.	Number of high-quality ideas generated across units.	Number of high-quality ideas generated from outside the firm.	Percentage of all ideas generated that end up being selected and funded.	Percentage of funded ideas that lead to revenues; number of months to first sale.	Percentage of penetration in desired markets, channels, customer groups; number of months to full diffusion.

Figure 9 - Hansen and Birkinshaw's innovation value chain
Source: Hansen and Birkinshaw (2007).

Moreover, Neely and Hii (1998) advocate internal processes encompass certain features that include: idea generation and capture, review and implementation, performance measures, and training.

Idea generation and capture

A central part of the innovation process concerns the way firms go about organizing search for new ideas that have commercial potential (Laursen and Salter, 2006). Innovative companies constantly generate and capture new ideas. Employee suggestion schemes are instituted as a mechanism for capturing internal ideas. Successful ideas are rewarded and failure is regarded as part of learning process. Externally, innovative companies look to customers and suppliers as potential source of ideas. Contacts between R&D, design and production, sales and marketing and customers are encouraged.

Creativity operates along a continuum. It can come from the millions of small acts by employees that cumulate in significant continuous improvement, or alternatively, creativity can result in a radical idea that transforms business strategy or creates new businesses. Organizations need to encourage creativity right along this continuum and at all levels. Creativity requires divergent thinking of what may be unrealized, unproven or untested. It may be knowledge-driven (how do we apply new knowledge?) or vision-driven (this is our goal, what new knowledge do we need?). Creativity may be viewed as the process of generating ideas (Lawson, & Samson, 2001).

Review and implementation

Screening procedures are in place for identifying priorities among projects to ensure sufficient resources are channeled to driving the best ideas through fruition. This screening process typically involves the relevant functions such as R&D, production, sales and marketing and customers as well. Projects with spin-out potential are also identified in the review. The review serves as a forum for addressing existing developments and issues that may impact the firm at some point in time. In terms of implementation, innovative companies typically appoint project champions and multilayered, multi-functional teams to drive projects.

Performance measures

Innovative companies constantly review their progress by measuring against milestones set. Clear targets are set and competitors benchmarked in the areas of customer satisfaction, sales trend and market share, product development times, number of new product introduced and R&D.

Training

The skills content of staff at all levels are crucial to the ability to innovate. Continuous training and development of staff at all levels are common to innovative companies.

Neely and Hii (1998) advocate internal processes encompass certain features that include: idea generation and capture, review and implementation, performance measures, and training. Table 5 provides a comparison of reviewed innovation processes.

Table 6 - Innovation process: a comparison

References	Innovation process phases							
Kafouros (2008)	Conceptualization	Research	Technology creation	Design	Prototyping	Development	Commercialization	
Hansen and Birkinshaw (2007)	Idea generation		Conversion				Diffusion	
Neely and Hii (1998)	Idea generation	Idea capture	Review		Implementation		Performance measurement	Training
Saren (1984)	Idea generation		Screening	Commercial evaluation	Technical development	Testing	Commercialization	
Roberts and Frohman (1978)	Recognition of opportunity	Idea formulation	Problem solving		Prototype solution		Commercial development	Utilization and Diffusion

Source: based on Kafouros (2008), Hansen and Birkinshaw (2007), Neely and Hii (1998), Saren (1984), and Roberts and Frohman (1978).

2.1.1.3 Culture as innovation driver

Neely and Hii (1998) posit a clear sense of mission and purpose is common among innovative companies. Their strategy is well thought out and clearly articulated. Innovation is a coherent part of their strategy. The business philosophy is one of continuous improvement driven by total customer satisfaction and total quality management.

The authors suggest innovative companies adopt an open, multi-functional and multi-level team-based working approach towards project and problem-solving. Employees are empowered from the lowest levels. In terms of leadership, the chief executive demonstrates a personal commitment to innovation, possesses vision and enthusiasm and encourages risk-taking and change. Constant communication with customers, suppliers, investors and employees are the norm. The organizational structure of innovative companies is flatter in general. The environment is one of openness and feedback from the stakeholders is constantly solicited.

Values

The appropriate culture and climate within the organization is also vitally important to innovation success. The components underlying the culture and climate construct are tolerance of ambiguity, empowered employees, creative time, and communication (Lawson, & Samson, 2001).

One of the best ways of developing an open innovative culture is to respect and invest in people. Management hires the best quality researchers, experts and inventors, and then empowers them. Management recognizes that these employees may have different visions for the future and seek to incorporate these views into their innovation direction (Lawson, & Samson, 2001).

Often managers and employees are caught up in short-term operational challenges and do not have time for “blue-sky” thinking (Lawson, & Samson, 2001).

Risk Management

Management approach to innovation risk positively influences the innovation capability. Successful innovation is largely an issue of identifying and controlling risks (Jagersma, 2003). Innovation management seeks for identifying milestones along the journey where risks can be assessed. Eliminating risks that come with innovation significantly boosts the organization’s innovation capability. Successful innovation is mostly a result of identifying and controlling risk. Innovation performance will increase if barriers and innovation risks are eliminated (Asa et al., 2013).

Many studies have identified the willingness to take risks as a preferred behavior for innovative firms (Saleh, & Wang, 1993). Innovative firms do not, however, take unnecessary risks. They tolerate ambiguity, but seek to reduce it to manageable levels through effective information management and tight control over project milestones.

When failure and mistakes do occur, innovative firms learn the lessons and do not hide them from corporate view. They have generally incorporated a systematic process for reviewing failed projects as a valuable opportunity to learn and improve (Grady et al., 1993 as cited in Lawson, & Samson, 2001).

Leadership

Asa et al. (2013) advocate the leadership and management have a significant relation with the organizational innovation capability. Leadership has been emphasized as one of the most important individual influences on firm innovation, because leaders can directly decide to introduce new ideas into an organization, set specific goals, and encourage innovation initiatives from subordinates (Harbone, & Johne, 2003).

Organizations must pay attention to the leadership and management system. Thus, leaders are the people who should embrace innovation strategic planning, be inspirational, coaches, collaborators and explicit motivators. Failing to have this archetype in leaders predicts the future demise of a non-innovative organization in a face of fierce competition (Asa et al., 2013).

Open Communication

There seems to be an emerging consensus (Deal and Kennedy, 1982, Peters and Waterman, 1982, O’Reilly, 1989) that the following set of norms assists the development and commercialization of new products and processes. With respect to development, these include: the autonomy to try and fail; the right of employees to challenge the status quo; open communication to customers, to external sources of technology, and within the firm itself. With respect to commercialization or implementation, teamwork, flexibility, trust and hard work are considered to be critically important. The right culture is not just an important asset to assist in technological development: it may be a requirement.

Asa et al. (2013) do not find evidence that collaboration with different departments to enhance innovation, whereas there is no consensus on the benefits of this type of networking. The authors suggest that organizations improve both their departmental and external networking as a means to get new ideas from inside and outside the organization.

The authors highlight open communications between management and employees sets the stage for an atmosphere of trust and sharing information and knowledge with employees on a regular basis result into new ideas thus, enhance innovation. Collaborative networking in working environment that encourages generation of new ideas is critical to an organization. The organization must improve its collaborative networks both internally and externally, as customers and suppliers can provide innovative ideas. Successful innovative leaders must provide guidance for implementation of innovation culture in every level of organizational hierarchy.

Communication within the company and its network of firms is necessary to achieve innovation and learning outcomes. Communication facilitates knowledge sharing by combining the wide variety of experiences, opening dialogue, building on others ideas and exploring issues relevant to innovation. Innovative firms reward cross-functional, cross-hierarchical, cross-cultural and cross-technological exchange of information and knowledge. They recognize that it is not just the original technology or discovery which is important, but also the ability to combine it with other disparate technologies (Lawson, & Samson, 2001).

2.1.1.4 Organization as innovation driver

Strategy

Asa et al. (2013) concludes that innovation strategic planning is positively related to innovation activities of a company. To this regard, innovation ought to have a strategic plan to point to the direction the company should head: without some form of strategic planning, it is somewhat difficult to assess whether a given piece of information is likely to take the company to the right direction. Likewise, McGinnis and Ackelsberg (1983) advocates when innovation is linked to strategic planning, it is more realistic and supportable to achieve performance: when managers effectively carry out the strategic plan that guides the innovation to the right direction, it eventually achieves innovation performance (Johnston Jr., & Bate, 2013).

The link between vision, strategy and innovation is important to effective innovation management. Strategy determines the configuration of resources, products, processes and systems that firms adopt to deal with the uncertainty existing in their environment. It requires that firms make decisions about what businesses and functions they should be performing and in what markets. Successful innovation requires a clear articulation of a common vision and the firm expression of the strategic direction. This is a critical step in institutionalizing innovation. Without a strategy for innovation, interest and attention become too dispersed (Lawson, & Samson, 2001).

Structure

Asa et al. (2013) concludes that business and technical roles are positively associated with clear responsibility to lead the innovation planning and activities. Developing a focused innovation team with defined roles and responsibilities in conjunction with a defined innovation process seems to improve an organization's innovation capability. Damanpour and Gopalakrishnanb (1998) highlight structural characteristics facilitate adoption of innovations. Successful innovation requires an optimal overall formal business structure (Burgelman, & Maidique, 1988). Unless this structure and its resulting processes are conducive to a favorable environment, other components of the innovation system are unlikely to succeed (Lawson, & Samson, 2001).

As businesses grow there is a tendency to add layers, becoming more mechanistic and institutionalizing bureaucracy (Kanter, 1983). High performing firms motivate and enable innovative behavior by creating permeable business boundaries helping break down the barriers separating functions, product groups and businesses (Ashkenas, 1998; Maira, & Thomas, 1998). The more permeable and organic the structure, the greater the potential for innovative ideas to spring (Lawson, & Samson, 2001).

Reward Systems

On reward systems as an incentive for innovation have significant influence on the organizational innovation capability, Asa et al. (2013) concludes there is a positive relationship between reward systems and employee willingness to innovate. Accordingly, Harden et al. (2008) show that different features of the reward system can stimulate different aspects of innovation within a company.

Firms can also set high-difficulty stretch goals for their employees to help institutionalize the drive for innovativeness. This forces a bias for innovation upon all employees, particularly where executive compensation is explicitly tied to achievement of these targets (Lawson, & Samson, 2001).

Reward systems are a powerful motivator of behavior and therefore, key to successful innovative activity. Saleh and Wang (1993) found significant difference in the entrepreneurial aspects of reward systems used by highly innovative against low innovative firms. Highly innovating firms constructed a reward system fostering creative behavior, including the "dual ladder" system, suggestion schemes, public recognition and financial bonuses. Managers do need to be aware of the effects of reward systems on behavior. An improperly focused system encourages people to act in potentially unintended ways. For example, Angle (1989) found that individual rewards tend to increase idea generation and radical innovations, while group rewards tend to increase innovation implementation and incremental innovations. Further, Mezias & Glynn (1993) found that without explicit support to the contrary, managers are likely to adopt a less risky course of action and focus on developing incremental variations of existing products. This approach would not stimulate radical innovation required to create new markets and alter the basis of competition (Lawson, & Samson, 2001).

Workplace environment

Teece (1996) advocates organizational culture is the essence of an organization's informal structure. Schwartz and Davis (1981, p. 33) define organizational culture as "the pattern of beliefs and expectations shared by the organization's members. These beliefs and expectations produce norms that powerfully shape the behavior of individuals and groups." Accordingly, O'Reilly (1985, p. 305) defines organizational culture as the "central norms that may characterize an organization". A strong culture is a system of informal rules that spells out how people are to behave most of the time. This is important because, as Deal and Kennedy (1982) state, by knowing what is expected of them, employees will waste little time deciding how to act in a given situation. There is no need to exist a consensus within an organization with respect to these beliefs, as the guiding beliefs held by top management and by individuals lower down in the organization may not be congruent. It is the latter, however, which define an organization's culture (O'Reilly, 1989, p.305). As a result, this set of norms assists innovation to take place (Trompenaars, & Hampden-Turner, 2012, O'Reilly, 1989, Deal, & Kennedy, 1982).

Workplace environment and workspaces have a positive influence on activities of innovation (Asa et al., 2013). Accordingly, Amabile et al. (1996) enhance the positive impact of work environment on organizational creativity and innovation. Work environment and workspaces are therefore conducive in driving innovation in an organization.

Lawson and Samson (2001) claim companies can institutionalize a little innovation by providing employees with creative environment.

2.1.1.5 External environment as innovation driver

Chesbrough (2003) proposes the main shift in industrial research relies on the transition of the closed innovation paradigm[2] to another paradigm more focused on the external environment. According to this new paradigm, research and development are not intended to be confined within the borders of the company: customers, competitors, suppliers, strategic partners, investors and Government play an active role in this context. Figure 10, as follows, portrays the difference between closed innovation and open innovation and highlights the active role of external agents.

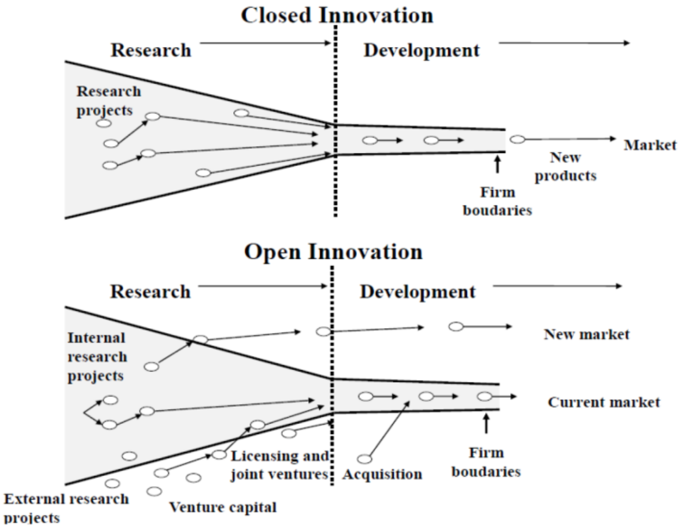

Figure 10 - Closed innovation and open innovation: a comparison
Source: Chesbrough (2003).

Accordingly, Laursen and Salter (2006, p. 131) emphasize that "new models of innovation have suggested that many innovative firms have changed the way they search for new ideas, adopting open search strategies that involve the use of a wide range of external actors and sources to help them achieve and sustain innovation."

Customers, competitors, suppliers

Innovative companies are proactive in their approach towards customers. Customer satisfaction is their key performance driver. They know their markets and benchmark performance against competitors and the world's best in class regardless of functions. These innovative companies develop strong supplier relationship and are actively involved in partnership sourcing.

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[2] The closed innovation paradigm refers to the innovation process being conducted entirely within the borders of the firm and external agents play a secondary role.

Asa et al. (2013) recommend that the organizations should improve both their departmental and external networking as it is essential to get new ideas from inside and externally particularly from customers and suppliers that are useful for pull innovation.

Organizational intelligence has been defined as "the capability to process, interpret, encode, manipulate and access information in a purposeful, goal-directed manner, so it can increase its adaptive potential in the environment in which it operates" (Glynn, 1996, p. 1088). Since knowledge and ideas are primary imports into the innovation process, intelligent firms can use this information to reduce the inherent uncertainty and ambiguity of innovation. It allows them to identify new avenues for investigation and to more quickly eliminate unprofitable options. This relies on being able to generate, communicate and act on the most relevant, up-to-date information available about their environment. For example, Saleh and Wang (1993) show that high-performing innovators proactively used environment scanning, technological forecasting and competitive analysis toward this goal. Organizational intelligence is primarily about learning from customers and learning about competitors. Burgelman and Maidique (1988) highlight the critical importance of understanding both competitors and markets to innovation management.

Innovators create an awareness of customers—both internal and external—which extends throughout the organization. Employees are actively encouraged to search out customer needs and problems, both known and latent, in order to solve them in a value adding manner. Various techniques have been used to generate more accurate customer information and insight into their problems. A major approach to understanding customer needs has been lead-user innovation (von Hippel, Thomke, & Sonnack, 1999). Companies focus on their most demanding customers and attempt to innovate to solve their problems thereby creating a product or service which is likely to add value to the vast majority of customers with less stringent requirements. Moreover, Leonard and Rayport (1997) illustrated how skilled observation of customers in everyday settings could be used to stimulate innovation and solutions to problems which customers were not even aware existed.

The process of generating, learning and applying knowledge about competitors' products and strategies is also critical. The competitive intelligence literature states that competitor learning plays two significant roles in product competition: position diagnostic benchmarking and position advantage building (Day, & Wensle, 1988; Dickson, 1992). A firm with superior competitor information can use this know- ledge to advantage. First, it can apply its strengths against a rival's weakness, internalize competitors' strengths by imitation and improvement or discount the strength of others by differentiating their products.

Strategic partners

Innovative companies seek for active collaboration with other companies and academia to maximize knowledge and minimize risk. Chesbrough (2003) posits many Science and Engineering schools have research centers willing to receive material and financial support. Moreover, the author suggests closer interaction with researchers and students, because they might be interested in developing a joint research project with the company's R&D.

Investors

Investors play a crucial role in the innovation process. Innovative companies hold regular dialogue with investors informing about their innovative activities and ensuring confidence and long term relationships with investors.

Government

Innovative companies tend to regard regulation (not over-regulation) in a positive manner. They are aware of proposals for legislation which might affect them and participate in standard-setting and influence regulatory procedures. They tend to work in partnership with the government.

2.2 Internationalization

Internationalization refers to selling products and services in markets other than the home one and engaging in activities facilitating a foreign market presence. Grosse and Kujawa (1992) state that internationalization of business happens via several key type of activities, such as exporting, importing, investing directly, licensing, engaging portfolio investment, obtaining unilateral loans and conducting transfers. Shi and Gregory (1998) define internationalization as the process by which a company increases its engagement with international operations. Vasconcellos (2008a) characterizes business internationalization as any initiative conducted by a firm aiming to expand its operations outside its country of origin. Therefore, internationalization is the process of strategic planning and its implementation by a firm in order to operate in countries outside from the country where it was originally established.

Basu (2000, p. 14) claims "the world of international business undergoes a transition in which companies are ignoring borders between countries and are considering the whole world as one single global marketplace. Such a break in geographic borders, time, and domestic barriers is converting current organizations in global organizations, which keep alliances and people worldwide." Carneiro (2000, p. 14) states "the phenomenon known as globalization is forcing some Brazilian companies to review their expansion strategies. In a supposedly more opened economic system, these companies feel more and more threatened in the domestic environment by new and capable rivals and, at the same time, they consider better entry opportunities in the international marketplace."

Regarding the classification of internationalized companies, Dyment (1987) suggests that they could be divided into several groups related to the phase of internationalization and the type of international activities in which they engage. These include:

- *Exporting firm*: during this primary phase of the internationalization, the firm usually concentrates initiatives on exporting to one or several foreign countries;
- *Multinational firm*: the firm tries to exploit important competitive advantages, first, domestically, and then in other countries. The multinational firm aims to transfer activities from its headquarters to foreign subsidiaries;
- *Global firm*: at the end of the 1970s, there emerged a trend in which firms started adopting coordinated strategies within all countries where they had operations, aiming to acquire global competitive advantages. Critical activities of such firms are concentrated in one or several countries; and
- *Transnational firm*: such a firm combines adequately maximum economic efficiency, maximum capability to respond to local markets and extensive flexibility to transfer experiences from some countries of its operation to the whole organization functioning worldwide.

There are theoretical models of firm internationalization that try to "explain the internationalization strategic decision, but can also describe internationalization phases or stages, indicating a continuous strategy view" (Vasconcellos, 2008a, p. 134). The most important of these models are briefly referred as follows.

2.2.1 Internationalization models

Hymer's Model: power of market

This model confers that firms operate in more than one country because they have competitive advantages over rival foreign companies in their home markets. They exploit their advantages, first, in their home market, then they go international (Hemais, & Hilal, 2004).

Vernon's Model: life cycle of a product

The product life cycle model of Vernon (Buckley, & Casson, 1998) suggests that firms begin their internationalization with exporting before shifting to direct investments. Moreover, established products are manufactured in emerging economies, because products manufactured with the application of stable technologies tend to be manufactured in countries where labor costs are low. The international product life cycle theory advocates that technology transfer is a means to reach and accelerate access to new markets (Vasconcellos, 2008a).

Buckley and Casson's model: internalization

This model suggests that firms pass through various steps in their internationalization process. The first one is indirect exporting, followed by direct exporting, which is then followed by the use of an agent, establishment of sales subsidiaries and finally of production subsidiaries in a foreign market. Firms tend to internalize activities whose external transaction costs are high or whose transactions are inefficient (Vasconcellos, 2008a). Buckley and Casson (1998) consider two interdependent reasons for a firm to launch operations in another country. Location refers to where to internationalize, i.e. the choice of a country or region. Control systems refer to the organization and management of the internationalization process. It can be exporting, organized and controlled in the country of origin, licensing, organized in the country of origin and contractually controlled in the host destination, and direct investment, organized and controlled out of the county of origin.

Dunning's Model: the eclectic paradigm

One of the most popular internationalization models is Dunning's eclectic paradigm. This was created to communicate the idea that the holistic explanation of international activities needs to have sound links with several economic notions. This model emphasizes the application of FDI as the most feasible alternative of firm's international involvement (Vasconcellos, 2008a).

Uppsala School's Model (Johanson and Vahlne)

The Uppsala stage model (Johanson, & Vahlne, 1977) emphasizes non-economic values in a firm's decision to go abroad. Internationalization is developed gradually, with successive entries in new markets and gradual involvement and engagement within each of these markets. According to Mazzola (2006), this approach has three premises. It assumes (1) lack of knowledge to internationalize as a key obstacle to internationalization, (2) knowledge acquisition is achieved and augmented through international experience in previous markets, and (3) the entry in a new distant market is the consequence of knowledge accumulation. Johanson and Vahlne (1990) propose a four-stage process for international involvement, including: (1) non-regular exporting activities, (2) exports through independent representatives, (3) the launching of a foreign subsidiary, and (4) the launching of operating units. As the process evolves, the firm would be more committed to international initiatives, which would include dedicated and specialized resources. Such incremental development is a response to perceived high risks associated with overseas markets. As the firm accumulates knowledge, risks get gradually lower.

Bartlett and Ghoshal's Model

Bartlett and Ghoshal (1998) propose an internationalization model based on the notion of transnational corporation, which is a highly competitive form worldwide with a multinational flexibility and global learning ability.

Nordic School's Model (Andersson)

The Nordic School model developed by Andersson (2000) places the entrepreneur as key to the internationalization process of the firm. This model also relates the environment and the moment in which the entrepreneur would act and the resources deployed for internationalization.

Network theory

The Network theory emphasizes the relationships between headquarters and subsidiaries of the international firm, and between subsidiaries and external entities, such as suppliers and competitors. Competitiveness is associated with the performance of networks rather than with the performance of isolated organizations (Fleury, & Fleury, 2001). Armando (2008, p. 63) argues that “there are many ways to establish relations with global networks. One possibility is through attracting and developing joint initiatives with multinationals. When multinationals launch an operation, they provide a channel ready to be used by local companies. They also bring initiatives for local companies to reach the so-called world class standard to compete with or to sell to multinationals.”

Another benefit is the transfer of technology through interaction with multinationals. Dedrick and Kraemer (1998) investigated the rewards that emerge from the relationships in the global production system: the most evident of which was the access to foreign markets through the distribution channels of MNEs and direct exports to local distributors. Table 7 presents a summary of the main features of the models and theoretical approaches.

Table 7 - Main features of theoretical approaches about internationalization

Theoretical approaches	**Main features**
Hymer’s Model: power of market	- Internationalization of a company occurs due to competitive advantages over foreign companies in its own market. - Advantages are first exploited in the domestic market and then in international markets.
Vernon’s Model: life cycle of product	- Internationalization occurs sequentially: first, exports, then FDI. - Established products are manufactured in developing countries.
Buckley and Casson: internalization	- Internationalization occurs when transaction costs are lower than market costs.
Dunning’s Model: the eclectic paradigm	- Internationalization occurs when the company perceives propriety, internalization, or location competitive advantages.
Uppsala School’s Model (Johanson and Vahlne)	- Internationalization occurs gradually. - Preference for countries with lower psychic distance in relation to the origin.
Bartlett and Ghoshal’s Model	- Organizational structures based on: companies’ need to develop competences for strategic demands and administrative heritage.
Nordic School’s Model (Andersson)	- Focus on the role of the entrepreneur. - Personal and professional networking.
Network Theory	- Internationalization is viewed from the whole chain perspective, and not an isolated one.

Source: Vasconcellos (2008a).

Brazil is a latecomer in the internationalization process and its participation in the international marketplace is still limited (Fleury, & Fleury, 2007), even disproportionately smaller in comparison to the size and potential of the Brazilian economy. Rocha (2003) posits that Brazilian firms do not go international due to four main reasons. First, the country's geographic position: Brazil has borders representing insurmountable natural obstacles hampering internationalization. The second reason is associated with the environment, in which political and economic macroenvironment issues are dominant. Third, the Brazilian market is huge and its size motivates firms to serve mostly the domestic market. Fourth, Brazilians consider themselves culturally distant from other nations, excluding to an extent the people living in the Latin American region and the Iberic Peninsula.

Whenever a firm decides to go international, it has to define internationalization goals and a marketing strategy for foreign operations. Most firms start with a small international involvement. Some plan to remain small, while others have greater ambition in overseas markets. Fleury and Fleury (2011, p. 204) suggest that "once a firm decides to go international, the key issue is to define the markets to which it should dedicate efforts." If the option is to enter a developed country, it is necessary to consider that there will be high barriers to entry, such as high level of quality standards. Moreover, there will be aggressive competitors in those markets. Another potential setback is that companies do not master the language spoken in the country where they are planning to go. They do not know well the market structure, clients' preferences, legislation, technical norms, or local business practices. Furthermore, managers need to synchronize different time zones.

Therefore, in order to reduce risks and increase chances for success, a firm may choose a foreign market with a high degree of institutional and cultural similarity to the home market (Fleury, & Fleury, 2007). Cyrino et al. (2010) have found that 47 per cent of international Brazilian firms launched their first operation in Latin America; 21 per cent in Europe, of whom most selected the Iberian countries of Portugal and Spain; 18 per cent in North America, mainly in regions with Latino population. Fleury and Fleury (2007, p. 163) claim that "as they learn in closer countries, companies diversify their geographic portfolio and start exporting to culturally distant locations. Regarding foreign investments, the trend is much the same." Cultural distance can be defined as the difference between the culture of the country of origin and the culture of the country where internationalization is conducted (Hofstede, 1989). Cultural distance increases or reduces the effectiveness of management of the internationalizing firm considering its specific advantages associated with a certain location (Dunning, 1993). Firms need to be careful when choosing a market if the decision is made only on the basis of cultural proximity. They risk neglecting markets with better potential. Culture can lead to misperceptions about differences between countries and the potential opportunities they can offer. It can also lead to predictable marketing initiatives that constitute a disadvantage in terms of competitiveness.

Abilities to deal with diverse cultures and promotion of international integration are conditions that are associated with political, economic, and legal knowledge of the environment of the host countries, in which the firm launches international operations. In line with this, Vasconcellos (2008b, p. 194) advocates that “the structure of an organization focused on internationalization is intrinsically based on the development of human relations, may they be individual, group, inter-group, organizational, and inter-organizational. As a result, it is relevant to consider the cultural aspect with focus on the analysis of the social group and the structures based on its routines and on its inter-relations.”

2.2.2 Internationalization drivers

Cyrino et al. (2010) present a commitment scale of international entry modes, which was developed based on the Uppsala’s School model and other theories about international entry modes. Such scale ranges from 1 to 8, where level 1 represents the least committed international entry mode and level 8 represents the most committed international entry mode. All levels include, sequentially:

- Exports through third parties;
- Direct exports;
- Licensing;
- Strategic alliances with foreign companies;
- Franchising;
- Settlement of own commercial subsidiaries;
- Settlement of own production plant; and
- Settlement of R&D plant.

International entry modes showing lower commitment may indicate that companies are exploring the market. It means these companies are assessing the acceptance of their products and services in foreign markets. As a result, they gain experience in international markets (Cyrino et al., 2010).

Rialp et al. (2005) propose that international entrepreneurship have focused on both internal and external factors. Internal factors include: (1) global vision of managers since the establishment of the firm, (2) previous experience of managers, (3) commitment of management to international operations, (4) personal and business-oriented relationships and networks, (5) level of management market knowledge and commitment, (6) availability of intangible assets based on managerial knowledge, (7) value creation through product differentiation, technological leadership, innovation, and quality, (8) development of proactive internationalization strategy focused on market niches spread throughout worldwide, (9) customer orientation and relationship, and (10) flexibility for quick adaptation to changes of the external environment. Furthermore, external factors include: (1) industry in which the firm operates, (2) the specificities of the geographic context markets, (3) market conditions among sectors of economic activities, and (4) technological advancements in operational aspects of production, transportation, and communication.

Accordingly, Keupp and Grassmann (2009) provide factors that are important for international entrepreneurship. They include:

- Personal: managers have good socio-cognitive skills and knowledge of demographics;
- Firm: R&D intensity, international experience, market share and size, firm ownership, advertising intensity;
- Industry: foreign and domestic industry structure, government policy, industry competition;
- Country: cultural distance, host country issues;
- Firm strategy: product-market strategy, planning, competitive strategy, international orientation;
- Competitive advantage: comparative advantage, intellectual property, innovative capabilities;

- Resources and capabilities: resource stock, technology, factor endowments, resource constraints, organizational capabilities;
- Organizational learning: learning capabilities, technological learning, knowledge growth, integration; and
- Interfirm organization: use of collaborative agreements, interfirm networks, spillovers.

Prioste and Yokomizo (2012) propose that internationalization theory suggests that when a Brazilian firm goes international, it should consider the following issues:

- Understand the culture of the countries in which the firm intends to internationalize;
- Set its marketing mix in accordance with the specifics of each target;
- Use extensive professional networking to prepare for internationalization;
- Whenever possible, establish offices in or near key markets;
- Invest in qualified manpower with excellent command of foreign languages, mostly English;
- Seek for a good alignment with partners;
- Prepare and implement a plan to create and promote an international brand;
- Joint associations which can assist and promote a firm’s international operations;
- Seek for government financing support for engaging in exporting;
- Use current multinational client firms to leverage international businesses; and
- Exhibit products and services in national and international exhibitions, fairs, and workshops.

The authors suggest that factors that may prevent Brazilian firms from entering international markets include:

- Organizational structure and managerial systems focused on domestic operations;
- Low levels of preparedness for international operations;
- Non-priority global products platforms;
- Lack of systematic investments to attract and retain people embedded with international expertise and mindset;
- Managerial staff composed mainly by employees with no international background;
- Good command of foreign languages considered not an issue;

- Lack of knowledge on international markets and their relationships; and
- Difficulties regarding cultural issues.

Table 8 – Internationalization drivers

Internationalization drivers			References
Internal	Managers: personal features	Global vision of managers	Rialp et al. (2005)
Internal	Managers: personal features	Commitment of management to international operations	Rialp et al. (2005)
Internal	Managers: personal features	Previous experience of managers, including good knowledge of foreign languages, especially English	Prioste and Yokomizo (2012), Rialp et al. (2005)
Internal	Managers: personal features	Personal and business-oriented relationships and networks	Prioste and Yokomizo (2012), Rialp et al. (2005)
Internal	Managers: personal features	Managers have good socio-cognitive skills and knowledge of demographics; level of management market knowledge and commitment	Keupp and Grassmann (2009), Rialp et al. (2005)
Internal	Firm and Strategy	Value creation through product differentiation, technological leadership, innovation, and quality	Keupp and Grassmann (2009), Rialp et al. (2005)
Internal	Firm and Strategy	Development of proactive internationalization strategy focused on market niches spread throughout worldwide	Keupp and Grassmann (2009), Rialp et al. (2005)
Internal	Firm and Strategy	Flexibility for quick adaptation to changes of the external environment	Keupp and Grassmann (2009), Rialp et al. (2005)
Internal	Firm and Strategy	Customer orientation and relationship	Prioste and Yokomizo (2012), Keupp and Grassmann (2009), Rialp et al. (2005)
Internal	Firm and Strategy	International experience	Rialp et al. (2005)
Internal	Firm and Strategy	Market share and size	Rialp et al. (2005)
Internal	Firm and Strategy	Firm ownership	Rialp et al. (2005)
Internal	Firm and Strategy	Comparative advantage	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Intellectual property	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Innovative capabilities	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Resources	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Technology	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Factor endowments	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Organizational capabilities	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Organizational learning	Keupp and Grassmann (2009)
Internal	Firm and Strategy	Advertising intensity and international brand	Prioste and Yokomizo (2012),

			Rialp et al. (2005)
		Exhibit products and services in national and international exhibitions, fairs, and workshops	Prioste and Yokomizo (2012)
External	Industry	Foreign and domestic industry structure	Keupp and Grassmann (2009), Rialp et al. (2005)
		Industry competition	
		Market conditions among sectors of economic activities	Rialp et al. (2005)
		Technological advancements in operational aspects of production, transportation, and communication	
		Interfirm organization (use of collaborative agreements, interfirm networks, spillovers)	Keupp and Grassmann (2009)
	Country	Cultural distance	Prioste and Yokomizo (2012), Keupp and Grassmann (2009)
		Host country issues (example: establish offices in near key markets)	
		Government policy (example: seek for government financing support for engaging in exporting)	

Source: based on Prioste and Yokomizo (2012), Keupp and Grassmann (2009), and Rialp et al. (2005).

2.3 Internationalization and innovation

Porter and Stern (2002) posit that it is imperative to any organization that aims to sustain its competitive advantage the decision to innovate globally. These companies must create new products and processes to expand technological frontiers and advance faster than their competitors. According to the authors, the traditional innovative model is focused on internal factors—capabilities and internal business processes that create and market technologies. Internal factors are extremely important but external are as important as internal to innovation.

The degree of a firm’s internationalization plays a crucial role. Multinational corporations have a number of firm-specific characteristics that allow them to better exploit and appropriate the benefits of innovation. Such factors include: (1) hire better scientists and establish alliances with local firms and universities; (2) reach many potential customers; (3) develop economies of scale and lower costs; and (4) accumulate more knowledge and increase the opportunities to learn. As a result, there is increased innovative capacity and appropriability. Figure 11, next, shows the relations between these factors.

Accordingly, Teece (1986) posits that highly international firms obtain a wide range of complementary assets that allow them to convert a technological success into a commercial success, and consequently to outperform their competitors. Likewise, Buckley and Casson (1976) suggest that MNEs have distinct advantages that allow them to exploit their innovation-intensive products. These advantages refer to the ability of such firms to increase appropriation by using discriminatory pricing and to their ability to integrate the outputs of research and development with the marketing and production functions.

The relationship between R&D, competitive advantage and firm performance becomes even more complex if multinational enterprises (MNEs) are taken into account because they operate, sell and develop their products and processes in many different locations around the globe and the degree of a firm's internationalization plays a crucial role. MNEs have a number of firm-specific characteristics that allow them to develop new technologies successfully, and better exploit and appropriate the benefits of innovation. On the other hand, however, a greater degree of internationalization increases substantially coordination, communication, and control costs (Kafouros, 2008).

Figure 11 - Factors that contribute to MNEs' increased innovative capacity
Source: Kafouros (2008).

Caves (1982) argues that organizations that expanded to other countries received high economic payoff for their innovations because they can offer their products to a large number of potential buyers. Likewise, Lu and Beamish (2004) showed that firms can exploit full value when they deploy their products in many countries because of economies of scale. Whilst domestic firms cannot cover the high costs of innovation (Hitt et al., 1994), highly international firms can lower such costs by performing many activities internally and by applying their process innovations to many production sites (Kotabe et al., 2002).

Moreover, Hitt et al. (1994) suggest that internationalization and diversification allow MNEs to improve their innovative capability by employing the specific resources an advantages of different economies and by establishing alliances with local firms and universities (Santos, 2004).

Furthermore, the costs of developing new products and processes are lower for MNEs as they can buy R&D inputs from the cheapest available sources and locate their R&D departments in regions which are productive or in regions where the cost for resources—such as land, materials, workforce, and scientists—is low (Granstrand et al., 1993; Kotabe et al., 2002).

Nevertheless, although a high degree of internationalization may provide a firm with competitive advantage, not all multinationals can benefit from R&D. Kafouros (2008) highlights the following problems: (1) coordination and control of geographically dispersed R&D sites may increase innovation costs, (2) the unwitting dissemination of ideas and know-how from poorly-controlled departments—a severe scenario may include the spillover of a knowledge to rivals and other firms—, and (3) distance has a negative impact on the quality, frequency, and speed of communication, thereby raising the risk of misunderstandings (Fisch, 2003, von Zedtwitz, & Gassmann, 2002).

The growth strategy is always a combination of the product and market options–existing or new products in current or new markets. Although there is no single route to successful corporate growth, innovation and internationalization are often deemed as growth-seeking strategies (Kyläheiko et al., 2011).

On the one hand, ever since Schumpeter (1942), innovation-based growth has been regarded as a key strategy on both the firm and the industry level (Kafouros et al., 2008; Nelson & Winter, 1982). Firms embedded with strong R&D capabilities may pursue innovation-based growth more aggressively and continuously launch new products or services on the market.

On the other hand, internationalization is often recognized as a significant opportunity for growth and, therefore, value creation (Kyläheiko et al., 2011; Lu & Beamish, 2001; Buckley & Casson, 1976). Firms operating in small open economies with limited domestic markets are more likely to endeavor new markets, which seems not to be the Brazilian case. However, increasing costs of R&D–which is usually deemed as sunk costs incurred before any sales are made–drive firms to international markets, as increases of revenues are achieved only when a broader market is regarded.

Kyläiheiko et al. (2011) claim that both innovation and internationalization are based on the existing resources and capabilities and therefore it is natural to think they must be somehow interrelated. Saarenketo (2004) advocates that, in some high-tech industries, for a firm producing innovative products that have only a few (if any) potential domestic clients, internationalization is mandatory if it is to stay in business. Kafouros et al. (2008) highlight "… firms need to have a sufficient degree of internationalization, i.e., be active in many markets, to capture successfully the fruits of innovation. However, Kyläiheiko et al. (2011) conclude that internationalization is not necessary for all firms (at least not in the short run) that launch innovations and not all internationalized firms are necessary very innovative (at least not in terms of new product launches).

When relating both innovation and internationalization, four growth strategies emerge: (1) the domestic innovator, when the firm innovates solely in the domestic market; (2) the domestic replicator, when the firm does not innovate in the domestic market; (3) the international replicator, when the firm replicates its portfolio abroad; and (4) the international innovator, when the firm innovates its portfolio abroad. Table 9, as follows, offers a summary of these relations.

Table 9 - Classification of growth strategies

Innovation	Domestic innovator	International innovator
No innovation	Domestic replicator	International replicator
	No internationalization	**Internationalization**

Source: Kyläheiko et al. (2011).

Complementary, Park and Bae (2004) introduce a comprehensive framework using three dimensions to categorize different types of new venture strategies. They include: level of technological capability (follower versus pioneer), product-market maturity (existing versus emerging), and target market (local versus global market). The technological capability is related to the innovation capability. The product-market concept is related to the product life cycle—PLC—the introduction and growth stages refer to emerging markets, while maturity and decline stages refer to existing markets. Finally, the target market is defined as the geographical scope of the markets that ventures enter and in which they operate. Table 10, next, provides Park and Bae's (2004) new venture strategies framework.

Table 10 - Park and Bae's new venture strategies framework

<table>
<tr><td colspan="3" rowspan="3"></td><th colspan="3">Level of technological capabilities</th></tr>
<tr><th colspan="2">Global follower</th><th rowspan="2">Global pioneer</th></tr>
<tr><th>Local follower</th><th>Local pioneer</th></tr>
<tr><th rowspan="3">Product-market maturity</th><th colspan="2">Global emerging</th><td></td><td>Early market entry</td><td>Global innovation</td></tr>
<tr><th rowspan="2">Global existing</th><th>Local emerging</th><td>Proactive localization</td><td>Creative imitation</td><td>Global niche</td></tr>
<tr><th>Local existing</th><td>Reactive imitation</td><td>Import substitution</td><td></td></tr>
</table>

Source: Park and Bae (2004).

Based on these three dimensions, Park and Bae (2004) have developed seven types of new venture strategies. A summary is provided in Table 11, as follows.

Table 11 - Park and Bae's venture strategies: a summary

Venture strategy	**Dimensions**	**Feature**
Reactive imitation	Local followers in the local existing market	Traditional SMEs that operate in an existing market, which is at the mature or decline stage. Such SMEs usually lack R&D activities
Import substitution	Local pioneers in the local existing market	Local firms with certain technological capabilities that provide products with a similar or slightly lower quality than MNEs and global innovators, but which are offered at a lower price to customers
Proactive localization	Local followers in the local existing market	Followers that imitate technology from market, performing modifications to meet customer's needs
Creative imitation	Local pioneers in the local emerging market	The firms possess technological capabilities in emerging industries in a local market and they are followers in the existing global markets
Global niche	Global pioneers in the global existing market	New ventures focused on niche markets, offering specialized products at a premium price

Early market entry	Global followers in the global emerging market	New ventures that are fast followers in global markets, combining existing knowledge and new technology development to provide their products in global emerging markets
Global innovation	Global pioneers in the global emerging market	New industries are created through the invention and commercialization of new technology and through the application of existing technology to new products

Source: adapted from Park and Bae (2004).

Kyläheiko et al. (2011) advocate that innovation and internationalization are often regards as growth strategies. As companies continuously seek for larger market share—as a proxy for market growth—, it is quite reasonable to depict that companies aims at acquiring more innovation capabilities and internationalization capabilities. Nevertheless, having high levels of innovation capabilities does not mean that the company is indeed innovative: it does mean that the company gathers conditions to let innovation to flourish. Likewise, having high levels of internationalization capabilities does not mean that the company is successfully internationalized, but that it musters conditions which may propel the internationalization process.

2.4 Conceptual model

The literature review has so far discussed definitions about innovation, innovation capability, and internationalization. Therefore, as a summary of the literature review, this is timely to present the conceptual models that will drive the construction of the questionnaire and the field research.

Innovation capability is regarded as the potential of a firm to generate innovative outputs. As a result, the relation of innovation capability with innovation outputs is quite direct: a firm with a high degree of innovation capability is more likely to produce innovation outputs than those with lower degrees of innovation capability.

Table 12, next, summarizes innovation drivers and constructs, according to literature references.

Table 12 – Conceptual model of innovation drivers

Innovation dimension	**Innovation driver**	**References**
Resources	People Technologies Funding Time Intellectual Capital	Asa et al. (2013), Laswon and Samson (2001), Christensen and Oversorf (2000)
Processes	Generation Capture Conversion Diffusion	Christensen and Overdorf (2000), Neely and Hii (1998), and Hansen and Birkinshaw (2007)
Culture	Values Risk Management Leadership Open Communication	Asa et al. (2013), Lawson and Samson (2001), Christensen and Overdorf (2000), Neely and Hii (1998), and Hansen and Birkinshaw (2007)
Organization	Strategy Structure Reward Systems Workplace Environment Portfolio Management	Asa et al. (2013), Lawson and Samson (2001), Christensen and Overdorf (2000), Neely and Hii (1998), and Roberts (2007).
External environment	Competitive Forces Institutions Strategic Alliances	Neely and Hii (1998), and Christensen and Overdorf (2000)

Source: based on Asa et al. (2013), Lawson and Samson (2001), Hansen and Birkinshaw (2007), Christensen and Overdorf (2000), Neely and Hii (1998), Roberts (2007), and Chesbrough (2003).

3 METHODOLOGICAL PROCEDURES

After a literature review on the main concepts of innovation, innovation capability, innovation drivers, internationalization, business performance, and the joint relations, a conceptual model for innovation drivers was presented by the end of previous chapter. The construct of each innovation driver is of vital importance in the progress of this research.

Methodological procedures of this study encompass retrieving the conceptual level hypotheses previously depicted and translating such hypotheses into a more empirical level. Translating hypothesis from conceptual level into empirical level provides a clearer understanding on the nature of constructs, measurements, scales, and statistical techniques to be used. Next, hypotheses of this study are translated into empirical level, as proposed by Forza (2002).

Hypothesis 1 (conceptual level)

Innovation drivers would be not equally important for a company to innovate.

Hypothesis 1 (empirical level)

Compared to others, one or more innovation drivers would show higher means of importance for a company to innovate.

Innovation drivers are depicted from literature and the importance of each innovation driver is a composite single mean of the opinion of respondents who are asked to rate—within a 1-7 scale—the absolute importance they assign to that innovation driver.

Hypothesis 2 (conceptual level)

Innovation capability would derive from innovation drivers.

Hypothesis 2 (empirical level)

A construct for innovation capability would be a weighted indicator derived from the importance of each innovation driver.

The construct of innovation capability is a composite weighted mean of the importance of innovation drivers. As all innovation drivers are within a 1-7 scale, the resulting construct of innovation capability is within a 1-7 scale as well.

Hypothesis 3 (conceptual level)

Innovation drivers would be not equally practiced in companies.

Hypothesis 3 (empirical level)

Compared to others, one or more innovation drivers would show higher means of practice in companies.

Innovation drivers are depicted from literature and the practice of each innovation driver is a composite single mean of the opinion of respondents who are asked to rate—within a 1-7 scale—the presence and maturity of that innovation driver in the company they work for.

Hypothesis 4 (conceptual level)

Innovation drivers would show similarities regarding importance and practice.

Hypothesis 4 (empirical level)

Innovation drivers would be grouped into clusters regarding the joint combination of importance and practice.

Retrieving the specific goals of this study, it is possible to directly establish a linkage between each empirical level hypothesis and a specific goal. These are the first four specific goals of this study:

- SG1: Identifying the most important innovation drivers;
- SG2: Proposing a measurable construct for the innovation capability of a company;
- SG3: Identifying the most practiced innovation drivers; and
- SG4: Describing the gaps between the importance and the practice of innovation drivers.

Table 13, next, describes the relations between the conceptual level, empirical level, description and scale of empirical variables for specific goals 1 to 4. It eventually establishes the linkage between hypotheses and specific goals of this study.

Table 13 – The relations between conceptual and empirical level of hypotheses 1, 2, 3, and 4

	Hypothesis 1	**Hypothesis 2**	**Hypothesis 3**	**Hypothesis 4**
Conceptual level	Innovation drivers would be not equally important for a company to innovate	Innovation capability would derive from innovation drivers	Innovation drivers would be not equally practiced in companies	Innovation drivers would show similarities regarding importance and practice
Empirical level	Compared to others, one or more innovation drivers would show higher means of importance for a company to innovate	A construct for innovation capability would be a weighted indicator derived from the importance of each innovation driver	Compared to others, one or more innovation drivers would show higher means of practice in companies	Innovation drivers would be grouped into clusters regarding the joint combination of importance and practice
Description of empirical	Innovation drivers are depicted from literature. The importance of each innovation driver is a composite single mean of the opinion of respondents who are asked to rate the absolute importance they assign to that innovation driver. The practice of each innovation driver is a composite single mean of the opinion of respondents who are asked to rate the presence and maturity of that innovation driver in the company they work for. The construct of innovation capability is a composite weighted mean of the importance of innovation drivers.			
Scale of empirical	1-7 scale			
Most suitable statistical technique	Comparison of means	Exploratory factor analysis (principal components)	Comparison of means	Cluster analysis
Related specific goal	SG1	SG2	SG3	SG4

Proceeding with the translation of conceptual level hypotheses into empirical level hypothesis, there are hypotheses 5 to 8.

Hypothesis 5 (conceptual level)

Innovation would have positive effects on internationalization.

Hypothesis 5 (empirical level)

The practice of innovation drivers would explain positively the internationalization degree.

Internationalization degree is a composite single mean of six commonly used indicators to measure internationalization—to be detailed hereafter. Again, each internationalization indicator is translated into an empirical and numerically based measure within a 1-7 scale.

Hypothesis 6 (conceptual level)

Innovation capability would have positive effects on internationalization.

Hypothesis 6 (empirical level)

The construct of innovation capability would explain positively the internationalization degree.

Hypothesis 7 (conceptual level)

Innovation would have positive effects on business performance.

Hypothesis 7 (empirical level)

The practice of innovation drivers would explain positively the business performance.

Business performance is a composite single mean of eight used indicators to measure business performance—to be detailed hereafter. Again, each business performance indicator is translated into an empirical and numerically based measure within a 1-7 scale.

Hypothesis 8 (conceptual level)

Innovation capability would have positive effects on business performance.

Hypothesis 8 (empirical level)

The construct of innovation capability would explain positively the business performance.

These are the next four specific goals of this study:

- SG5: Describing the relations between innovation drivers and internationalization degree;
- SG6: Describing the relations between innovation capability and internationalization degree;
- SG7: Describing the relations between innovation drivers and business performance; and
- SG8: Describing the relations between innovation capability and business performance.

Tables 14 and 15, next, describe the relations between the conceptual level, empirical level, description and scale of empirical variables for specific goals 5 to 8. They eventually establish the linkages between hypotheses and specific goals.

Table 14 – The relations between conceptual and empirical level of hypotheses 5, 6, 7, and 8

	Hypothesis 5	**Hypothesis 6**	**Hypothesis 7**	**Hypothesis 8**
Conceptual level	Innovation would have positive effects on internationalization	Innovation capability would have positive effects on internationalization	Innovation would have positive effects on business performance	Innovation capability would have positive effects on business performance
Empirical level	The practice of innovation drivers would explain positively the internationalization degree	The construct of innovation capability would explain positively the internationalization degree	The practice of innovation drivers would explain positively the business performance	The construct of innovation capability would explain positively the business performance
Description of empirical input	Innovation drivers are depicted from literature and the practice of each driver is translated into an empirical and numerically based measure	The construct of innovation capability is a composite weighted mean of the practice of innovation drivers considered significant after an exploratory factor analysis	Innovation drivers are depicted from literature and the practice of each driver is translated into an empirical and numerically based measure	The construct of innovation capability is a composite weighted mean of the practice of innovation drivers considered significant after an exploratory factor analysis

Table 15 – The relations between conceptual and empirical level of hypotheses 5, 6, 7, and 8 (cont.)

	Hypothesis 5	Hypothesis 6	Hypothesis 7	Hypothesis 8
Scale of empirical input	1-7 scale			
Description of empirical output	Internationalization degree is a composite single mean of six commonly used indicators to measure internationalization		Business performance is a composite single mean of eight used indicators to measure business performance	
Scale of empirical output	1-7 scale			
Related specific goal	SG5	SG6	SG7	SG8

All specific goals are somehow interconnected and altogether they strive to meet the overall objectives: describe the relations of innovation and internationalization and describe the relations of innovation and business performance. Figure 12, next, portrays the relations and order of precedence of all specific goals.

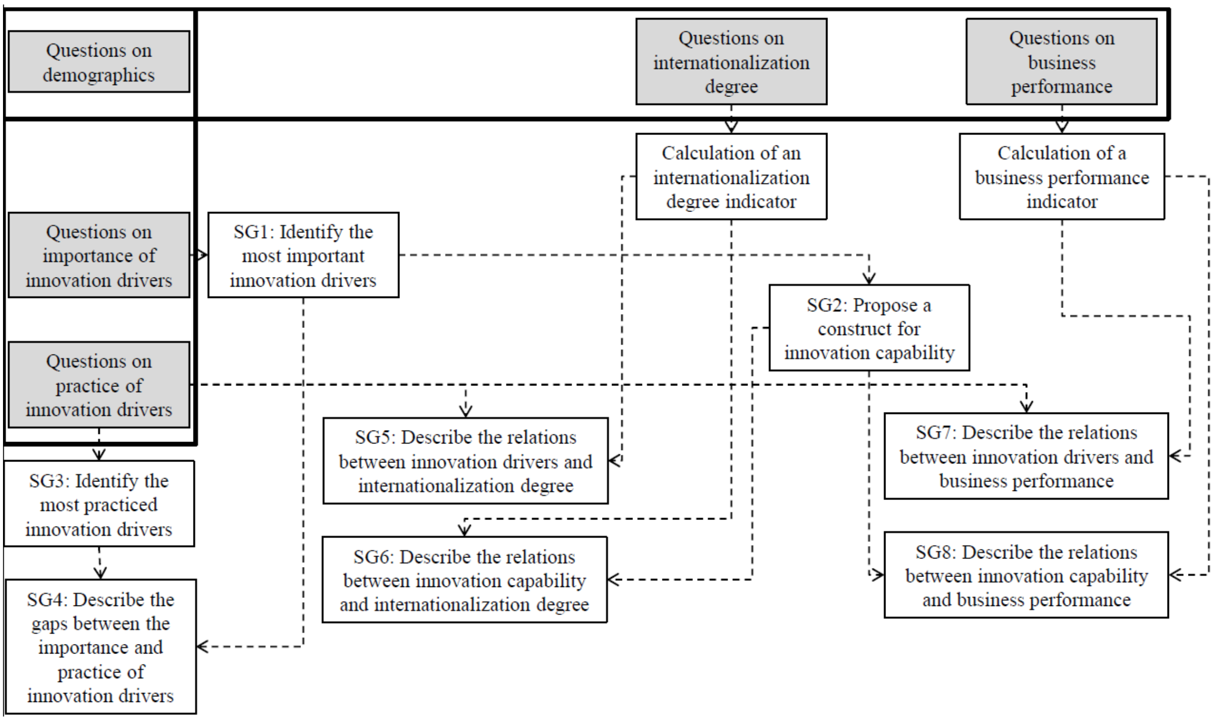

Figure 12 – The relations between sections of the questionnaire and specific goals

It is also timely to depict the relations between specific goals and sections of the questionnaire. Although further details are provided hereafter, this is expected the questionnaire to be divided into three sections, say: (1) questions on importance of innovation drivers and on practice of innovation drivers, (2) questions on internationalization indicators and on business performance indicators, and finally (3) questions on demographics, both respondent-specific and company-specific. Shaded boxes (Figure 12) represent the questionnaire: sections 1, 2, and 3.

Another important remark is about the calculation of the internationalization degree and of the business performance. Again, details are to be provided next, but it is timely to highlight that the questionnaire includes no one single question on the internationalization of a company, but a set of them—six internationalization indicators. Therefore, the desired output—the internationalization degree—has to include some calculation taking the whole set of six questions as a starting point. The same rationale is cast over the calculation of business performance: there are eight business performance indicators and the business performance considers the whole set of eight questions.

Questions on importance of innovation drivers are the input for the identification of the most important innovation drivers—SG1. Each respondent represents a practitioner and he or she is asked to assign a grade within the 1-7 scale for each innovation driver—representing 1 the least important grade and 7 the most important grade. Considering the total of respondents, a mean for the importance of each innovation driver is calculated. Finally, a statistical technique for comparing means is deployed and it is eventually possible to emerge with a ranking from the claimed most important innovation driver to the least important. Main contribution of SG1 includes providing managers with an up-to-date picture on innovation drivers that are considered the most important for a company to innovate.

Questions on practice of innovation drivers are the input for the identification of the most practiced innovation drivers—SG3. The same respondents of the importance of innovation drivers are asked to assign a grade within the 1-7 scale, but this time regarding the practice of such drivers in the company they work for. The same procedure of calculating a mean for the practice of each innovation driver is implemented. Eventually, a ranking from the claimed most practiced innovation driver to the least practiced is emerged. Main contribution of SG2 includes providing managers with an up-to-date picture on innovation drivers that are considered the most practiced for a company to innovate. As they compare these results with the practices at their own company, they should identify practices in which their company is above or below the market average.

As the results from SG1 and SG3 come to light, it is possible to analyze the gaps between the important and practiced innovation drivers. This is SG4. It is expected that some innovation drivers hold different means for the joint combination of importance and practice—may it be higher or lower. Therefore, a statistical technique for identifying clusters of innovation drivers is put into practice. Main contribution of SG4 is providing a manager with clusters of innovation drivers that are (1) both important and practiced, (2) neither important nor practiced, (3) important but not practiced and so forth. In possession of these results, a manager can prioritize actions to promote those innovation drivers that are considered the most important and, at the same time, the least practiced.

SG2 encompasses a proposal of a construct for innovation capability. As there are no means for directly measuring the innovation capability of a firm, a construct of the innovation capability is proposed, geared by the presented literature review. Cooper and Schindler (2008) define construct as an image or abstract idea created specifically for a certain research or while building a theory. Constructs are built combining simpler and more concrete concepts, when the idea or the image aimed to be studied is not subject to direct observation. This is the case of innovation capability. The proposal of the innovation capability construct tracks two pathways: (1) the first is solely theoretical and emerges from a weighted mean regarding the importance means assigned in SG1 and (2) the second is also theoretical, but more complex in terms of calculations and should represent a more complete construct for innovation capability. For approach (2), a statistical technique for reducing data is employed, as identifying innovation drivers that hold strong relations with each other is pursued. Progressing both ways allows comparing the emerged constructs: one simpler and easily calculated and another more complex and therefore, closer to reality. The main contribution of SG2 is to offer a reliable, feasible, and applicable construct for innovation capability. Such construct should reflect the individual contributions of each innovation driver; therefore it should appear to be like a weighted mean of innovation drivers, each driver holding a different weighting. Whenever managers have little time to conduct a comprehensive research on innovation drivers, reduction of data is useful to provide this manager with a powerful tool to make the aimed research feasible.

The attempt in SG5, SG6, SG7, and SG8 is to describe respectively the relations between (1) innovation drivers and internationalization degree, (2) innovation capability and internationalization degree, (3) innovation drivers and business performance, and (4) innovation capability and business performance. Innovation drivers and innovation capability are the input of such models and internationalization degree and business performance are the output. In this study, ‘describing’ means identifying descriptors of the output from the set of input. Moreover, it regards calculating the contribution—positive or negative—and the magnitude—strong or weak—of each input descriptor. Finally, it means calculating the power of explanation of each model—different set of input: how much of the output variability is explained by the (set of) input. Contributions of these goals are immense: understanding which input variable(s) leads to more explanation of the output variable(s) is valuable in providing managers with recommendations on what to prioritize and nurture when desiring to foster a certain result.

This study is fully quantitative and the survey instrument for collecting data is selected to conduct the field research. Generally, a survey involves the collection of information from individuals about themselves or about the social units to which they belong (Rossi et al., 1983). In the case of this study, the survey is employed both to ask for information about respondents and the company for which they work. Babbie (1990) and Kerlinger (1986) advocate the survey can contribute to the advance of scientific knowledge in different ways: exploratory findings, confirmatory findings, and descriptive findings (Malhotra and Grover, 1998, Filippini, 1997, Pinsonneault and Kraemer, 1993). Forza (2002) provides the following definitions:

- *Exploratory surveys*: take place during the early stages of research and the goal is to provide preliminary insights on a topic—such insights are the basis for other in-depth refined research. They usually use no models, and concepts of interest need to be better understood and measured. In preliminary stages, they can help to determine the concepts to be measured in relation to the phenomenon of interest, how to measure them, and how to unveil new facets of this phenomenon. Next, they uncover evidence of association among concepts. Finally, they can help to explore the valid boundary of a theory;
- *Confirmatory surveys*: take place when knowledge of a phenomenon has already been articulated in terms of theory—and its well-defined concepts, models, and propositions. In this case, data are collected aiming at testing the adequacy (1) of the concepts developed in relation to the phenomenon, (2) of hypothesized linkages between the concepts, and (3) of the validity boundary of the models; and

- *Descriptive surveys*: take place when it is aimed to understand the relevance of a certain phenomenon and describe the distribution of it in a population. It is not intended to develop a theory, but the facts can provide useful hints both for theory building and theory refinement.

This study is confirmatory in essence, but with flavors of descriptive procedures. SG1, SG2, SG3, and SG4 are likely to belong to the descriptive part of this study, while SG5, SG6, SG7, and SG8 draw nearer the confirmatory approach.

Definitions and constructs thereby applied in this study encompass: (1) innovation drivers, (2) importance of innovation drivers, (3) practice of innovation drivers, (4) innovation capability, (5) internationalization indicators, (6) internationalization degree, (7) business performance indicators, and (8) business performance. Table 16, next, relates definitions and constructs, their source, unit of analysis, scale, and related specific goal.

Table 16 – The relations between constructs, sources, unit of analysis, and related specific goals

Definitions and constructs	Source	Unit of analysis	Scale	Related SG
Innovation drivers	Literature	-	-	-
Importance of innovation drivers (each)	Innovation drivers and Questionnaire – Section 1	The respondent	1-7 scale	SG1, SG4
Practice of innovation drivers (each)	Innovation drivers and Questionnaire – Section 1	The company		SG3, SG4
Innovation capability	Importance of innovation drivers (each)	The company		SG2
Internationalization indicators (each)	Questionnaire – Section 2	The company		SG5
Internationalization degree	Internationalization indicators (each)	The company		SG6
Business performance indicators (each)	Questionnaire – Section 2	The company		SG7
Business performance	Business performance indicators (each)	The company		SG8

Innovation drivers are depicted from the literature and constitute the foundations of all innovation constructs—importance of innovation drivers, practice of innovation drivers, and innovation capability. Next, except for the importance of innovation drivers—which has the respondent as unit of analysis—, all other definitions and constructs have the company as unit of analysis. All measureable concepts are within a 1-7 scale.

3.1 The questionnaire

As previously depicted, the questionnaire is divided into three sections: (1) questions on importance of innovation drivers and on practice of innovation drivers, (2) questions on internationalization degree and on business performance, and finally (3) questions on demographics, both respondent-specific and company-specific.

3.1.1 Importance and practice of innovation drivers

For section 1, the questionnaire is built on the basis of the conceptual model. Affirmative sentences are created as an attempt to measure the importance of innovation drivers. As only one affirmative is developed for each driver, as many as possible procedural activities are deployed for each affirmative sentence in order that affirmative to encompass the underlying idea of that driver. Tables 17 and 18 exhibit the relations between the innovation drivers and the resulting affirmatives of the questionnaire for assessing the importance of each innovation driver.

Table 17 – The relations between the conceptual model and the questionnaire (section 1 – importance)

Innovation capability dimension	**Innovation capability driver**	**Innovation capability driver codification**	**Questionnaire affirmative:** **I consider that…**
Resources	People	IMPT_01	… attracting, developing, and retaining talented people is very important for a company to innovate.
	Technologies	IMPT_02	… possessing and managing the latest technologies is very important for a company to innovate.
	Funding	IMPT_03	… providing access to a variety of funding channels—both inside and outside the company—is very important for a company to innovate.
	Time	IMPT_04	… allocating adequate working time for employees to conduct new—even personal—ventures is very important for a company to innovate.
	Intellectual Capital	IMPT_05	… enabling conditions to acquire, disseminate, and utilize useful knowledge is very important for a company to innovate.

Table 18 – The relations between the conceptual model and the questionnaire (section 1 – importance) (cont.)

Innovation capability dimension	Innovation capability driver	Innovation capability driver codification	Questionnaire affirmative: I consider that…
Processes	Generation	IMPT_06	… stimulating creativity and generation of new ideas is very important for a company to innovate.
	Capture	IMPT_07	… systematically selecting the best ideas is very important for a company to innovate.
	Conversion	IMPT_08	… converting ideas into feasible projects is very important for a company to innovate.
	Diffusion	IMPT_09	… successfully launching products, services, or processes to the market is very important for a company to innovate.
Culture	Values	IMPT_10	… establishing and disseminating values that set innovation as a priority is very important for a company to innovate.
	Risk Management	IMPT_11	… being tolerant to calculated risk is very important for a company to innovate.
	Leadership	IMPT_12	… having leaders who are inspirational is very important for a company to innovate.
	Open Communication	IMPT_13	… promoting open communication between people inside and outside the company is very important for a company to innovate.
Organization	Strategy	IMPT_14	… establishing and disseminating a strategy that sets innovation as a priority is very important for a company to innovate.
	Structure	IMPT_15	… establishing a less hierarchical organizational structure with clear definition of roles is very important for a company to innovate.
	Reward Systems	IMPT_16	… establishing and disseminating a reward program that benefits those who bring relevant contributions is very important for a company to innovate.
	Workplace Environment	IMPT_17	… having a workplace with excellent levels of organizational climate is very important for a company to innovate.
	Portfolio Management	IMPT_18	… successfully managing several projects, products, or services at once is very important for a company to innovate.
External Environment	Competitive Forces	IMPT_19	… continuously monitoring, gathering information, and accessing customers, suppliers, and competitors is very important for a company to innovate.
	Institutions	IMPT_20	… continuously monitoring, gathering information, and accessing government, academia, and associations is very important for a company to innovate.
	Strategic Alliances	IMPT_21	… successfully establishing strategic alliances is very important for a company to innovate.

An adapted 7-point Likert scale questionnaire is deployed to measure the importance the respondent assigns to each affirmative—and each affirmative as a proxy for a certain innovation driver. The scale is adapted—and not original—because there is no label classification on each point as it is generally common. Oppositely, only a classification for the lowest and highest levels of concordance is presented: be 1 = totally disagree and be 7 = totally agree.

Next, the second part of section 1 is consisted of affirmative sentences that attempt to measure the practice of innovation drivers. Likewise, only one affirmative is developed for each driver and as many as possible procedural activities are deployed for each affirmative sentence in order that affirmative to encompass the underlying idea of that driver. Table 19 shows the relations between the innovation drivers and the resulting affirmatives of the questionnaire for assessing the practice of each innovation driver.

Table 19 – The relations between the conceptual model and the questionnaire (section 1 – practice)

Innovation capability dimension	**Innovation capability driver**	**Innovation capability driver codification**	**Questionnaire affirmative:** **I consider that the company I work for…**
Resources	People	PRCT_01	… attracts, develops, and retains talented people.
	Technologies	PRCT_02	… possesses and manages the latest technologies.
	Funding	PRCT_03	… provides access to a variety of funding channels—both inside and outside the company.
	Time	PRCT_04	… allocates adequate working time for employees to conduct new—even personal—ventures.
	Intellectual Capital	PRCT_05	… enables conditions to acquire, disseminate, and utilize useful knowledge.
Processes	Generation	PRCT_06	… stimulates creativity and generation of new ideas.
	Capture	PRCT_07	… systematically selects the best ideas.
	Conversion	PRCT_08	… converts ideas into feasible projects.
	Diffusion	PRCT_09	… successfully launches products, services, or processes to the market.
Culture	Values	PRCT_10	… establishes and disseminates values that set innovation as a priority.
	Risk Management	PRCT_11	… is tolerant to calculated risk.
	Leadership	PRCT_12	… has leaders who are inspirational.
	Open Communication	PRCT_13	… promotes open communication between people inside and outside the company.
Organization	Strategy	PRCT_14	… establishes and disseminates a strategy that sets innovation as a priority.
	Structure	PRCT_15	… establishes a less hierarchical organizational structure with clear definition of roles.
	Reward Systems	PRCT_16	… establishes and disseminates a reward program that benefits those who bring relevant contributions.
	Workplace Environment	PRCT_17	… has a workplace with excellent levels of organizational climate.
	Portfolio Management	PRCT_18	… successfully manages several projects, products, or services at once.
External Environment	Competitive Forces	PRCT_19	… continuously monitors, gathers information, and accesses customers, suppliers, and competitors.
	Institutions	PRCT_20	… continuously monitors, gathers information, and accesses government, academia, and associations.
	Strategic Alliances	PRCT_21	… successfully establishes strategic alliances.

In both cases, the translation of each innovation driver into a single sentence is clearly a limitation of this study because the respondent may not assess the intended innovation driver through the given affirmative sentence. On the other hand, special attention is driven to validate affirmatives as an attempt to reduce the dissonance between the affirmative sentence and the innovation driver to be assessed. Details on such validation are presented later in this document.

3.1.2 Internationalization degree and business performance

Internationalization degree and business performance have to be assessed through the questionnaire because they ought to be employed as outputs in SG5, SG6, SG7, and SG8. Nevertheless, both concepts are barely impossible to be measured directly. Therefore, separate and independent indicators are proposed and used as an attempt to propose and calculate constructs.

3.1.2.1 Internationalization degree: a construct

For the purposes of this study, the internationalization degree is a composite single mean of specific internationalization indicators that are measureable. Tables 20 and 21 exhibit the relations between the internationalization indicators and the underlying concept of each indicator. Six internationalization indicators are proposed as an attempt to measure the internationalization of a company.

Table 20 – The relations between the internationalization indicator and the underlying concept

Internationalization Indicator	Concept	Scale	
% of income from abroad (if no internationalization, consider < 5%)	More internationalized companies show higher % of income from abroad	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Number of countries where the company operates, except the country of origin	More internationalized companies show higher number of countries where it operates	a) 0 b) 1 c) 2 – 5 d) 5 – 10	e) 10 – 20 f) 20 – 50 g) > 50
Number of own employees abroad (if no employees abroad, consider < 9)	More internationalized companies show higher number of own employees abroad	a) < 9 b) 10 – 19 c) 20 – 49 d) 50 – 99	e) 100 – 499 f) 500 – 1000 g) > 1000
Initial year of internationalization	More internationalized companies have hold operations abroad for a longer time	a) None b) Last 2 years c) 2 – 5 d) 5 – 10	e) 10 – 20 f) 20 – 40 g) > 40

Table 21 – The relations between the internationalization indicator and the underlying concept (cont.)

Internationalization Indicator	Concept	Scale
In general, how different are the countries where the company operates, compared to the country of origin, in terms of language, culture, legislation, business conditions, etc.?	More internationalized companies hold operations in psychic different countries	1 ○ ○ ○ ○ ○ ○ ○ 7 1: small difference 7: huge difference (if no internationalization, consider 1)
Internationalization commitment (higher levels of commitment may encompass activities in lower levels)	More internationalized companies show higher levels of international commitment	Details in the text

The first indicator (INTL_01) is the % of income that comes from abroad—more internationalized companies are supposed to show higher levels of income coming from abroad. The scale is similar to that employed to measure business performance—details later—and seems to be adequate to distinguish more internationalized companies from less internationalized.

The second indicator (INTL_02) is the number of countries where the company operates, except the country of origin—more internationalized companies operate in several countries simultaneously. Considering a total of approximate 200 different countries in the world, a company operating in more than 50 can be considered wondrously internationalized. On the other hand, it is useful to distinguish the one-country internationalized company, because it shows a somewhat higher internationalized degree when compared to a non-internationalized company. Again, the scale seems to adequately distinguish more internationalized companies from less internationalized.

The third indicator (INTL_03) is the number of own employees abroad—more internationalized companies have more employees abroad, may they be locals or expatriates. The scale derives from the numbers of employees to classify a company regarding its size—micro, small, medium, and large—and regarding the industry in which it operates—manufacturing and others. According to the European Commission (2003), a micro-company employs no more than 9 people; a small company employs from 10 to 49 people; medium company employs from 50 to 249 people; and a large company employs 250 or more people. The European Commission refers to annual work unit, AWU, instead of people or employee. SEBRAE (2012), *Serviço Brasileiro de Apoio às Micro e Pequenas Empresas*, a well-known

Brazilian institution to promote the development of micro and small companies, proposes a difference in terms of classification when considering manufacturing companies: a micro company in manufacturing employs up to 19 people while its peers in commerce and services employs up to 9 people; a small company in manufacturing employs from 20 to 99 people and a small company in commerce or services employs from 10 to 49 people; a medium company in manufacturing employs from 100 to 499 people and a medium company in commerce or services employs 50 to 99 people; finally, a large manufacturing company employs 500 or more people and a large commerce or service company employs 100 or more people. Therefore the resulting scale seems to be adequate for a research being conducted in Brazil.

The fourth indicator (INTL_04) is the initial year of internationalization—more internationalized companies have hold international operations for a longer period of time. The scale is a proposition to represent how long a company is already internationalized and it ranges from no internationalization until more than 40 years.

The fifth indicator (INTL_05) is the psychic difference of countries in which the company operates compared to the country of origin. The concept of psychic difference is deeply investigated in the literature (Hofstede, 1989). The scale is a 7 point proposition to measure such difference in terms of language, culture, legislation, business conditions etc. Larger scores denote very different countries, therefore more internationalized companies.

Finally, the sixth indicator (INTL_06) is the international commitment—more internationalized companies show higher levels of international commitment. The scale is an adaptation of that proposed by Cyrino et al. (2010), which is a commitment scale of international entry modes. Such scale ranges from 1 to 8, where level 1 represents the least committed international entry mode and level 8 represents the most committed international entry mode. Table 22, next, depicts the relations between Cyrino et al.'s (2010) internationalization commitment items and the resulting scale for the questionnaire of this study.

All items proposed by Cyrino et al. (2010) are sequentially disposed except for strategic alliances with foreign companies. The resulting questionnaire considers this item as reflecting more the international commitment of a company when a global integration is present—including global sourcing and distribution. Moreover, licensing and franchising are not considered in the final questionnaire because they seem not to represent a sequence or commitment in terms of internationalization. The resulting scale ranges from 1 to 7, convergent to other questions on internationalization.

Table 22 – The adaptation of Cyrino et al.'s international commitment indicator

Cyrino et al.'s (2010)	This study (resulting questionnaire)
-	no international activities
Exports through third parties	export through partners
Direct exports	export through own agents
Licensing	-
Franchising	-
Settlement of own commercial subsidiaries	settlement of own business offices
Settlement of own production plant	settlement of own productive units
Strategic alliances with foreign companies	integration of global sourcing and distribution
Settlement of R&D plant	settlement of R&D units

Source: adapted from Cyrino et al. (2010).

Finally, internationalization degree is not directly measured though it is intuitively understood as an overarching measurement encompassing several separate and independent internationalization indicators. In this study, internationalization degree (INTL_ME) is assumed to be a simple mean of all internationalization indicators, say: (1) income from abroad, (2) number of countries, (3) number of employees, (4) initial year, (5) psychic difference, and (6) international commitment. As all internalization indicators are measured within a 1-7 scale, the composite simple mean is necessary within this same range. A higher mean denote a more internationalized company.

3.1.2.2 Business performance: a construct

Likewise, the business performance indicator is a composite mean of specific business indicators. Those business indicators derive from the studies of Yam et al. (2010), who encompass the contributions from Guan and Ma (2003), Yam et al. (2004), Fu and Shi (1995), and Wan et al. (2003) to propose four appropriate measurements for innovation performance: sales performance (PERF_01), innovation performance (PERF_02), sales growth (PERF_03), and product performance. Except for the product performance measurement, the other three measurements were also deployed in the studies of Evangelista et al. (2001). The authors define product performance as the competitiveness of a firm’s new products. In this context, product competitiveness is a portfolio concept that encompasses various aspects, such as average concept-to-launch time, quality level, cost advantage, market competitiveness, uniqueness of product, uniqueness of the process technology employed, etc.

For the purposes of this study, Yam et al.’s (2010) measurements for innovation performance are adapted to reflect not the innovation performance rather the business performance. Table 23, next, exhibits the translation from Yam et al.’s (2010) scales into the proposed scales of this own study.

Table 23 – The adaptation of Yam et al.’s measurements for sales and innovation

Performance indicator	**Yam et al.’s (2010)**	**This study (resulting questionnaire)**	**Scale**	
Sales Performance	Sales ($) due to technologically new or improved products as a percentage of total sales ($) during the past three years	Sales ($) due to technologically new or improved products—or services—as a percentage of total sales ($) during the past three years (average per year)	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Innovation performance	Number of commercialized new products as percentage of all products in company per year during the past three years	Number of commercialized technologically new or improved products—or services—as a percentage of all products—or services—during the past three years (average per year)	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Sales Growth	Company’s annual sales growth rate during the past three years:	Company’s annual sales growth rate during the past three years (average per year)	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%

Source: based on Yam et al. (2010).

The preference for using an existing questionnaire for measuring the business performance revolves about two main reasons: first, as the original questionnaire was deployed in previous studies, questions are likely to be already validated—as a result, the validation process of this own questionnaire is somewhat facilitated; second, conducting a field research with similar questions as those of the original questionnaire allows further comparative studies—although such comparative studies are not within the goals of the present study, the opportunity lingers.

Sales performance, innovation performance, and sales growth are each measured by a single question (Table 23) while product performance is measured by multi-items. Likewise, Table 24 presents the adaptation of Yam et al.'s (2010) measurements. Five indicators are proposed: (1) product or service quality (PERF_04), (2) cost advantage (PERF_05), (3) market competitiveness (PERF_06), (4) uniqueness of product, service, or process (PERF_07), and concept-to-launch time (PERF_08).

Table 24 – The adaptation of Yam et al.'s measurements for product

Yam et al.'s (2010)	This study (resulting questionnaire)	Scale
Product Performance Parameters	Business Performance	
Performance on the following parameters as compared with competitors during the past three years	Performance on the following parameters as compared with competitors during the past three years	
Product quality	Product or service quality	Compared with main competitors 1 = poorer 7 = better 1 ○○○○○○○ 7
Cost advantage	Cost advantage	
Market competitiveness	Market competitiveness	
Uniqueness of the product and/or process technology employed	Uniqueness of the product, service, or process technology employed	
Average product concept-to-launch time	Average product—or service—concept-to-launch time	

Source: based on Yam et al. (2010).

Annex 01 provides the original Yam et al.'s (2010) questionnaire for the measurements of the innovation performance. The questions for measuring these four types of performance are shown in Annex 01—the original Yam et al.'s (2010) questionnaire for the measurements of the innovation performance. The original scale was seven-pointed—this standard is kept for the purposes of this study—and higher score denotes a better performance of the assessed variable.

As previously stated, business performance is not directly measured though it is intuitively understood as an overarching measurement. In this study, business performance (PERF_ME) is assumed to be a simple mean of all separate and independent business performance indicators, say: (1) sales performance (PERF_01), (2) innovation performance (PERF_02), (3) sales growth (PERF_03), (4) product or service quality (PERF_04), (5) cost advantage (PERF_05), (6) market competitiveness (PERF_06), (7) uniqueness of product, service, or process (PERF_07), and (8) concept-to-launch time (PERF_08). As all business performance indicators are measured within a 1-7 scale, the composite simple mean is necessary within this range. Higher means denote better overall business performance.

3.1.3 Demographics

Demographics, which constitute the section 3 of the questionnaire, are divided into two parts: the first is related to the respondent and the second to the company. The main objective for introducing a section devoted to respondent-specific demographics is identifying whether the respondent is eligible for having the answers considered valid or not. Though not easy to define maturity—and this not the purpose of this study—, it is expected that the more mature the respondent, the better—or more qualified—the provided responses. Therefore, when analyzing missing data—details hereafter—low levels of maturity are considered for data deletion. Criteria include: (1) position in the company, (2) highest academic degree, (3) age, and (4) department in the firm. Table 25 shows the resulting respondent-specific questions and the originating criteria.

Table 25 – Criteria of respondent-specific questions (section 3 – respondent)

Respondent-specific variables	Closed Options	Criteria
Age	a) 18 – 24 b) 24 – 30 c) 30 – 36 d) 36 – 48 e) 49+	Baby Boomers, X, and Y generations (Y generation divided into three same-sized categories).
Gender	a) Male b) Female	Gender of the respondent.
Highest academic degree	a) Graduate degree b) Graduate student c) Undergraduate degree d) Undergraduate student e) Do not possess a major degree	Seniority of the respondent regarding highest academic background.
Position in the firm (consider your main activities and not the title of the position)	a) High management: owner, partner, CEO, VP, director or equivalent b) Middle management: manager or equivalent c) Low management: coordinator, supervisor, or equivalent d) Operations: analyst, specialist, or equivalent e) Intern	Seniority of the respondent regarding main activities in the firm.
Department in the firm (if no option is applicable, consider the closest to your main activities)	a) Strategy and Business Development b) Finance c) Marketing d) Operations e) People Management f) R&D g) Information Technology	Main departments of a company.

Another goal for having demographics for the respondent is to choose only one respondent to represent a company. As no constraint regarding number of respondents per company is established, multiple respondents per company are acceptable while carrying out the field research. SG1 and SG2 hold no constraint about number of respondents per company because they assess the importance of innovation drivers and therefore the unit of analysis is the respondent. Meanwhile, other specific goals depend on questions that measure the practice of innovation drivers; therefore the unit of analysis is the company. In this case, criteria to elect the best response for a single company include maturity of the respondent.

Next part of section 3 is the set of company-specific questions. The main objective for introducing a section devoted to company-specific demographics is gathering information on the company and deciding whether a certain company is eligible for taking part in this study. Too small companies—in terms of number of employees and yearly income—are not eligible for this study. Table 26 shows the resulting respondent-specific questions and the originating criteria.

Table 26 – Criteria of respondent-specific questions (section 3 – company)

Company-specific variables	Closed Options	Criteria
Number of employees	a) <9 b) 10 – 19 c) 20 – 49 d) 50 – 99 e) 100 – 499 f) 500+	European Commission (2003) and SEBRAE (2012). Details previously depicted.
Industry	a) Agribusiness b) Manufacturing c) Finance d) Utilities e) Other Services	Agriculture, manufacturing, and services encompass the three stages of human development. Finance and utilities are considered substantial within the services group.
Initial year of activities	a) Last 2 years b) 2 – 5 c) 5 – 10 d) 10 – 20 e) > 20	Maturity of the company regarding its longevity.
Country of origin	a) Brazil b) Latin America c) US or Canada d) Europe e) Asia f) Other	Origin of the company.
Yearly income	a) < BRL 2.4 million b) BRL 2.4 – 16 million c) BRL 16 million – 90 million d) BRL 90 million – 300 million e) > BRL 300 million	One of the most deployed proxies to measure the size of a company. This criterion is largely used in Brazilian surveys. Details in the text.

There are many ways to classify companies. Because the field research is conducted in Brazil, the yearly income variable is aligned to the proposal of BNDES (n.d.), *Banco Nacional de Desenvolvimento Econômico e Social*, which is a Brazilian official bank to foster development—generally related to macroeconomic projects, but not only:

- Micro-company: less than BRL[3] 2.4 million;
- Small company: more than BRL 2.4 million and less or equal BRL 16 million;
- Medium company: more than BRL 16 million and less or equal BRL 90 million;
- Medium-to-large company: more than BRL 90 million and less or equal BRL 300 million; and
- Large company: more than BRL 300 million.

Future studies may consider using company-specific variables to refine the findings of this study or, more ambitiously, conduct a brand new research on the relation between (1) innovation drivers and internationalization degree, (2) innovation capability and internationalization degree, (3) innovation drivers and business performance, and (4) innovation capability and business performance controlling for size—a composite of number of employees and yearly income—, maturity—initial year of activities—, industry, and country of origin. A study considering only Brazilian companies seems to be rich in terms of research on internalization of Brazilian companies.

3.1.4 Content validity and pre-test

Forza (2002) highlights that reducing abstract constructs so that they can be measured—which is the case of innovation drivers—presents several problems: alignment between the theoretical concepts and the empirical measures, the choice between objective and perceptual questions, or the selection of one or more questions for the same construct. Nevertheless, these problems can be overcome by the use of operational definitions that have already been developed, used and tested.

For section 1 of the questionnaire, innovation drivers are depicted from the literature. However, while translating each driver into the resulting affirmative—for both importance

[3] USD 1.00 ~ BRL 2.40 and EUR 1.00 ~ BRL 3.29 on January 27, 2014 (http://economia.uol.com.br/cotacoes/).

and practice—, while wording, many procedural activities were include in order to better describe that driver and therefore diminish the problem of alignment between the theoretical concepts and the empirical measures. Regarding the type of question, affirmatives are always subject to respondents' perception, thus the difference between objective and perceptual is not relevant for the purposes of this study. Even when an affirmative is drawn on a practice of the company the respondent work for, the resulting response is still a perception of the respondent regarding that innovation driver. This is the main reason all affirmative in section 1 were perceptual. Although more than one affirmative would result in more reliable responses, the option for only one affirmative per innovation driver comes from the limited time for the questionnaire to be completely filled out.

For section 2 of the questionnaire, internationalization indicators and business performance indicators were translated into 1-7 scale questions. For some questions, additional written explanations were employed directly in the questionnaire. Moreover, because some questions would cause doubts and hamper the respondent from providing full completion, it was decided that the researcher himself or the person to administer the questionnaire would be present while carrying out the field research. Not only has the researcher or the person to administer the questionnaire provided the respondent with detailed instructions on how to fill out the questionnaire, but they have also remained close to the respondent until the completion of the instrument.

For section 3 of the questionnaire, indicators on the profile of the respondent and on the profile of the company he or she works for constituted the demographics. These questions were objective, but still subject to respondents' perception in cases when the respondent has no or little information about the profile of the company. Better responses are expected to the extent respondents know a lot about the companies they work for. Nevertheless, it is not expected in this study because, in general, employees in Brazil are poorly informed about the companies they work for. Thus, this is a somewhat severe limitation of this study. Some respondents may access the webpage of the company they work for in order to gather more precise information and improve the quality of information.

Hensley (1999) propose that the development of questionnaire questions using both academic and practical perspectives should help researchers develop good preliminary scales and keep questionnaire revision to a minimum. Following such advice, in order to ensure a higher level of content validity, two scholars in the field of innovation management and other two innovation management executives were primarily consulted for improving the survey instrument. Both scholars and executives were selected on a convenience basis. As all participants had access to the conceptual model and a short explanation on the goals of the research, minor considerations were depicted and they generally included revision on the wording of the affirmatives. Nevertheless, one more in-depth suggestion deserves a comment: three of the affirmatives generated partial or full misunderstanding on the concepts of the innovation driver: risk management, open communication, and workplace environment. After revision and rewording these affirmatives, there were considered fine for measuring corresponding innovation drivers.

Forza (2002) proposes that pre-testing a questionnaire should be done by submitting the ‘final’ version of the questionnaire to three types of people: (1) colleagues, (2) industry experts, and (3) target respondents. Dillman (1978) advocates the role of colleagues is to test whether the questionnaire accomplishes the goals of the study. Industry experts are considered to prevent the inclusion of some obvious questions that might reveal avoidable ignorance of the investigator in the domain of the study. Finally, target respondents provide feedback on everything that can affect answering by. For this study, two colleagues, two industry experts, and five target respondents participated in the pre-test. Colleagues and industry experts filled out the ‘final’ version of the questionnaire in different days but with the assistance of the researcher. The five target respondents filled out the ‘final’ version of the questionnaire altogether, again, with the assistance of the researcher. All nine individuals were selected on a convenience basis and they were asked to complete the questionnaire and to measure how long they took to have it fully responded. Explanations on the completion of the questionnaire were provided to all respondents because the field research would count on the presence of the researcher as well. The average total time for filling out was about 15-20 minutes. These pre-test procedures were carried out in November 2013. In general terms, participants state that: the instructions were clear, the questions were clear, there were no problems in understanding what kind of answers were expected, or in providing answers to the questions posed. Therefore the ‘final’ version of the questionnaire administered for the purposes of the pre-test turned to be the real final version of the questionnaire to be put in practice during the field research.

As a result, the final version of the questionnaire is shown in Appendix 01. As the research was conducted in Brazil, translation of the questionnaire from English into Brazilian Portuguese was necessary. This procedure was performed by a Brazilian native speaker with full command of the English idiom. The final version of the questionnaire is exhibited in Appendix 02 and it was subject to revision and approval of three other Brazilian native speakers, all of them belonging to the faculty of three important Brazilian business schools.

3.2 Field research

In the search for the right compromise between rigor and feasibility, possible shortcomings and difficulties during the field research have to be considered. One possible source of error is sampling. A sample with no—or unknown—capability of representing the population excludes the possibility of generalizing the results beyond the original sample. Sampling overcomes the difficulties of collecting data from the entire population which can be impossible or prohibitive in terms of time, costs, other human resources, and even access. Nevertheless, in order to have better samples, these two issues should be addressed: randomness and sample size. The former is associated with the ability of the sample to represent the population of interest and the former with the requirements of the statistical procedures employed for measurement quality assessment and hypothesis testing (Forza, 2002). To this regard, when the unit of analysis is the executive—for SG1—, the population encompasses all executives in Brazil. When the unit of analysis is the company—for all other specific goals—, the population encompass all companies operating in Brazil. Therefore, the sample encompasses executives from companies operating in Brazil.

Probabilistic samples include elements of the population that have some known probability of being selected. It is used to assure the representativeness of the sample (Forza, 2002). The sample for this study can be considered probabilistic because possible respondents were considered eligible even before the field research was carried out. Nevertheless, the sample can be considered representative of the population because all respondents are Brazilian executives and belong to companies operating in Brazil.

Business practitioners were selected from students enrolled in graduate programs of four major business schools[4] in the city of São Paulo, which is regarded as a center of excellence in terms of business schools not only in Brazil, but in all Latin America. According to the purposes of this research, graduate programs included exclusively the following courses: graduation in business management—including the so-called MBA courses—, graduation in international business management, graduation in innovation management, graduation in entrepreneurship management and graduation in marketing. Invitations for conducting this research were sent to six of major business schools, however only four responded positively, in terms of access to the enrolled students in graduate programs in business. The advantage of choosing business graduate students is by far having immediate access to professionals from a wide variety of industries. Moreover, graduate students, in general, are not only currently working, but they do occupy decision making positions in their companies. Therefore, students enrolled in business graduation programs can be considered representative of business executives. In all cases, coordination of such graduation programs requested the researcher to directly establish a contact with the present professor or lecturer and request a permission to administer the questionnaire in the classroom. Therefore, questionnaires were personally administered and the main benefit of this is increased confidence that data collection instructions were followed. Dillman (1978) underlines that the response to a questionnaire should be viewed as a social exchange. To this regard, the researcher highlighted that those respondents looking forward to having access to main results and implications of the research would receive a summary of the study upon the consolidation of the final report. It was emphasized that participating in the research was not obligatory and that it would take as long as 15-20 minutes to full completion. Nevertheless, response rates were amazingly high, reaching a virtual rate of 100%.

The field research was conducted within the months of November and December 2013, a time range that coincides with the end of the academic semester in Brazil. This period was adequate for the purposes of this study because it is just before the academic vacation that comprises the period from end of December and whole January.

[4] Business schools that allowed the researcher to conduct the field research on their premises asked not to make their names public. They recurrently receive several similar demands and fail to meet the expectations due to constraints in terms of time, access, and mainly saturation of respondents, who are, in this case, the enrolled students of graduate programs.

Next, the first step in processing data entailed transcribing the data from the original documents to a computer database. Forza (2002) describe errors arise from two situations: (1) the transcriber misreads the source document but correctly transcribes the misinterpreted data (86 per cent of transcription errors are of this type), and (2) the transcriber reads the source document correctly but incorrectly transcribes the data. In addition to missing data, these errors lead the researcher to deletion of data without any attempt of recovery because of shortcoming in terms of operational resources and lack of time.

3.3 Describing collected data

Carmines and Zeller (1979) describe the goodness of measures is mainly evaluated in terms of validity and reliability. The former is concerned with whether we are measuring the right concept, while the latter is concerned with stability and consistency in measurement. Lack of validity introduces a systematic error, while lack of reliability introduces random error. Procedures to foster validity were depicted previously.

Reliability refers to the extent to which a measuring procedure yields the same results on repeated trials (Kerlinger, 1986). One commonly used method to estimate reliability is internal consistency, which assesses the equivalence, homogeneity, and inter-correlation of the items used in a measure. The items of a measure should hang together as a set and should be capable of independently measuring the same construct. The most popular test within the internal consistency method is the Cronbach coefficient alpha (Cronbach, 1951), which is the average inter-item correlation—ρ—among the n measurement items in the instrument under consideration:

$$\alpha = \frac{n\rho}{1 + (n-1)\rho}$$

Forza (2002) proposes a threshold: when Cronbach's alpha is greater than .8, the measure is very reliable, although a threshold of .6 is considered fine. For the purposes of testing the reliability of data, Cronbach's alpha is calculated for all importance and practice variables.

Next, the procedure of describing collected data includes the use of descriptive statistics for presenting and analyzing data. First data to be analyzed comprise demographics. It is good practice to calculate the frequency distribution of the demographics (Forza, 2002). Coopers and Schindler (2008) emphasize that such exploratory data analysis—EDA—resembles the role of a detective or investigator that search for clues, trails, and proofs that underpin other statistical techniques devoted to assess the strength of what is being inspected. This exploratory analysis of data offers a huge contribution in terms of visual representations and graphical techniques to summarize complex set of data and therefore is a required step while analyzing data. Frequency table and pie chart are two of the simplest techniques to present summarized data and this is the reason they are employed in this study.

Next, for input and output variables, Forza (2002) suggests preliminary data analysis is performed by checking tendencies, dispersions, frequency distributions, and correlations. Table 27, next, suggests measurements of descriptive statistics.

Table 27 – Descriptive statistics on frequencies, measures of central tendency, dispersion, and shape

Type of analysis	Explanation	Relevance
Frequencies	Refers to the number of times various subcategories of certain phenomenon occur	Generally obtained for nominal variables
Measures of central tendencies	Mean (the average value), median (half of the observation fall above and the other half fall below the median) and mode (the most frequently occurring value) characterize the central tendency (or location or center) of a set of observations	To characterize the central value of a set of observations parsimoniously in a meaningful way
Measures of dispersion	Measures of dispersion (or spread or variability) include the range, the standard deviation, the variance, and the interquartile range	To concisely indicate the variability that exists in a set of observations
Measures of shape	The measures of shape, skewness and kurtosis describe departures from the symmetry of a distribution and its relative flatness (or peakedness), respectively	To indicate the kind of departures from a normal distribution

Source: Forza (2002).

3.4 Analyzing collected data

Although the general goals of this study encompass describing the relations between innovation capability and internationalization degree, and the relations between innovation capability and business performance, eight specific goals were depicted in order to fulfill these general objectives. Each specific goal is studied through the use a specific set of statistical techniques. Such techniques are described hereafter.

3.4.1 Detecting and handling missing data

During the field research, the following cautions were taken to improve the completeness rate: (1) increasing the respondent involvement through raising awareness about the importance of this study and through rewarding those respondents with a summary report with main results upon the completion of this study, (2) giving clear instructions both orally and in the paper instrument, (3) defining a well-designed questionnaire divided into three specific sections and with precise instructions and with clear questions, and (4) providing the respondent with personal support—the researcher or a person trained to answer any frequently asked doubt. All these cautions aimed at preventing the presence of missing data. However, as stated by Forza (2002), despite all efforts, data will be missed and two broad strategies can be adopted: deletion and estimation.

Considering operational constraints of estimating data—which can introduce errors to the database—, this study opted to case deletion when data were missed. Notwithstanding, data deletion followed a rationale to be executed when deletion was necessary.

For SG1, a mean of grades from all respondents regarding the importance of an innovation driver is calculated. To this end, missing data do not compel the calculation of the aimed mean and therefore, no action is required. In other words, missing data of importance of each innovation driver do not interfere in the calculation of the mean. Missing data detection and handle for SG3 follow the same procedure—instead of calculating the importance mean, SG3 requires the calculation of practice mean.

As SG2 and SG4 depend exclusively on the outputs of SG1 and SG3, missing data do not disturb the execution of statistical techniques of exploratory factor analysis and cluster analysis. Therefore, no action regarding missing data is required.

On the other hand, for SG5, SG6, SG7, and SG8, a single missing datum in any of the output variables is reason for case exclusion—no other data of the respondent are considered while running statistical tests—and therefore, data of a whole case is deleted. Output variables include internationalization indicators and business performance indicators. In other words, when missing data include output variables, it is not possible to progress with the statistical regression techniques.

Missing data in demographics are not critical for the purposes of this study and therefore, no action regarding missing data is required.

3.4.2 Detecting and handling outliers

Hair Jr. et al. (2006) define outliers as observations with a unique combination of characteristics identifiable as distinctly from the other observations. Coopers and Schindler (2008) define them as uncommon cases and their identification include the threshold of more than 1.5 times the interquartile range (third quartile minus first quartile). Martins and Theóphilo (2009) claim that while collecting data, observations that get away from the expected dimensions may occur. These are the outliers. The authors propose that the observations exceeding the threshold of 3 for the standardized score are eligible to be classified as outliers. The standardized score is a dispersion measure represented as:

$$Z_i = \frac{x_i - \dot{x}}{S}$$

where Z_i is the standardized score of the i^{th} observation, x_i is the value of the i^{th} observation, $\dot{x}$ is the sample mean, and S is the sample standard deviation.

Grubbs (1969) posits that an outlier is one observation that appears to deviate markedly from other observations of the sample in which it occurs. The author proposes a test to detect outliers in a univariate data set assumed to come from a normally distributed population. As it is not possible to determine the shape of the distribution of the sampled data, this study discards the use of the Grubbs test. Another limitation of Grubbs' test regards the detection of one outlier at a time.

Ross (2003) proposes that another test for identifying outliers is that proposed by Peirce. This method can be applied to identify two or more outliers—which somehow is an advantage in relation to Grubbs' proposal. The outliers are identified when the probability of the system of errors obtained by retaining them is less than that of the system of errors obtained by their rejection multiplied by the probability of making so many, and no more, abnormal observations. Peirce's method presupposes the repeated use of an algorithm and therefore, operational shortcomings are expected. This is the reason this study opted not to use it.

Furthermore, the Chauvenet's criterion is a means of assessing whether one observation is likely to be spurious. The idea is to find a probability range, centered on the mean of a normal distribution, that should reasonably contain all observations of the data set. By doing this, if any observations remain outside this probability band, they are removed from the data set, and a new mean and standard deviation are calculated (Ross, 2003). Again, the same operational constraints observed at the Peirce's method are shown here and therefore, Chauvenet's criterion is discarded for the purposes of this study.

The Dixon's Q test—or simply the Q test—should be used sparingly and never more than once in a data set. Although it is quite simple to identify and exclude outliers through the Q test, it is applicable and suitable only to a small number of observations (Rorabacher, 1991, Dean, & Dixon, 1951). This is not the case of the presented study. Therefore, the Q test was rejected for the purposes of outlier identification.

The criterion of the standardized scores is used for the purposes of this study due to its operational feasibility and adequacy to the collected data. It regards a calculation for each observation—regarding as simple descriptive statistics as sample mean and standard deviation—and a direct comparison of the resulting value with an established threshold. In this study, the threshold is 3, which is wide enough to exclude only really observations markedly different from others. Hair Jr. et al. (2006) define that for small samples of size 80 or fewer, outliers typically are defined as cases with standard scores of 2.5 or greater; for larger samples sizes, the increase of the threshold value up to 4 is acceptable.

All methods considered so far regard the univariate detection of outliers. The univariate identification of outliers examines the distribution of observations for each variable in the analysis and selects as outliers those cases falling at the outer ranges of the distribution. Nevertheless, Hair Jr. et al. (2006) posit that in addition to the univariate assessment, both bivariate and multivariate detection of outliers must be considered when the statistical technique to be employed refers to bivariate or multivariate relations of input and output variables. Exploratory factor analysis, cluster analysis, and linear regressions are all multivariate techniques for data analysis. When two variables are considered, bivariate outlier detection is required; otherwise, when more than two variables are considered, multivariate detection is put into practice.

Bivariate detection regards pairs of variables that can be assessed jointly through a scatterplot. Those cases that fall markedly outside the range of the other observations are seen as isolated dots in the scatterplot. Therefore, a graphical portrayal of the scatterplot is a support in identifying outliers. A drawback of the bivariate method in general is the potentially large number of scatterplots that arise as the number of variables increases (Hair Jr. et al., 2006).

In order to detect multivariate outliers, it is necessary a means to objectively measure the multidimensional position of each observation relative to some common point. This is addressed by the Mahalanobis D^2 measure, which is a method that measures each observation's distance in multidimensional space from the mean center of all observations, providing a single value for each observation no matter how many variables are considered. Higher D^2 values represent the existence of observations farther removed from the general distribution of observations in this multidimensional space. The underlying drawback is that an overall assessment provides no insight as to which particular variables might lead to a high D^2 value. D^2 measure divided by the number of variables involved (*df*—degrees of freedom) is approximately distributed as a *t*-value. In the case of multivariate detection of outliers, threshold levels for the D^2/df measure should result in values of 2.5 for small samples versus 3 or 4 in larger samples. Once identified as a potential outlier on the D^2 measure, an observation can be reexamined in terms of the univariate and bivariate methods to more fully understand the nature of its uniqueness (Hair Jr. et al., 2006).

3.4.3 Performing tests of normality

Normality is regarded as the most fundamental assumption in multivariate analysis. It refers to the shape of the data distribution for an individual metric variable: if the variation from the normal distribution is sufficiently large, all resulting statistical tests are invalid, because normality is required to use the F and t statistics. Both the univariate and the multivariate statistical methods are based on the assumption of univariate normality, with the multivariate methods also assuming multivariate normality (Hair Jr. et al., 2006).

There are three methods by which it is possible to assess normality of a variable: (1) graphical analyses of normality, (2) specific normality tests, and (3) statistical tests of normality.

The simplest diagnostic test for normality is a visual check of the histogram that compares the observed data values with an approximating normal distribution. Histograms are employed whenever possible to group values of the inspected variable. They are useful (1) to show all ranges of a distribution, even those without observed values and (2) to check the shape of a distribution (Coopers, & Schindler, 2008). A distribution can be symmetric or asymmetric. Martins and Theóphilo (2009) define asymmetry as the degree to which the distribution departures from the equality of mean, median, and mode. A normal distribution is symmetric.

Another graphical analysis regards the normal Q-Q plot (Wilk, & Gnanadesikan, 1968), which is a method for comparing two probability distributions by plotting their quantiles against each other. The rationale is: first, the set of intervals the quantiles is chosen, a point on the plot corresponds to one of the quantiles of the second distribution plotted against the same quantile of the first distribution. The line is a parametric curve with the parameter which is the number of the range for the quantile. In normal distributions, dots stick to the line.

The third graphical inspection includes the boxplot, which is a visual representation of a set of data, including the lowest datum, the highest datum, the first and third quartiles, and the median (Coopers, & Schindler, 2008). The spacing between the parts of the boxplot helps indicate the degree of dispersion and skewness in the data. In normal distribution, the boxplot is symmetric.

The second method for assessing normality of a variable includes two specific statistical tests: the Shapiro-Wilk test (Razali & Wah, 2011, Shapiro & Wilk, 1965) and a modification of the Kolmogorov-Smirnov test (considering the Lilliefors significance correlation). Each calculates the level of significance for the differences from a normal distribution. Tests of significance are less useful in small samples (fewer than 30) and quite sensitive in large samples (exceeding 1,000 observations). Therefore, it is recommended to always use both the graphical inspection and statistical tests to assess the actual degree of departure from normality (Hair Jr. et al., 2006).

Finally, the third method to assess normality is based on the skewness and kurtosis values. Skewness is used to describe the balance of the distribution: if a distribution is unbalanced, a positive skew denotes a distribution shifted to the left, whereas a negative skewness reflects a shift to the right. Kurtosis refers to the ‘peakedness’ or ‘flatness’ of the distribution: distributions that are taller—or more peaked—than the normal distribution are named leptokurtic, while a distribution that is flatter is named platykurtic. Both analyses may unveil departures from normality. The statistic value (z) for the skewness value is calculated as:

$$z_{skewness} = \frac{skewness}{\sqrt{\frac{6}{N}}}$$

where N is the sample size. The statistic value (z) can also be calculated for the kurtosis as:

$$z_{kurtosis} = \frac{kurtosis}{\sqrt{\frac{24}{N}}}$$

In both cases, distributions are considered normal when the calculated z values do not exceed the specified critical value from a z distribution, based on the desired significance level. For .01 significance level (.01 error level), the threshold is ±2.58; for .05 significance level (.05 error level), the threshold is ±1.96 (Hair Jr. et al., 2006).

It is important to bear in mind that it is not necessary for a distribution to be perfectly normal, but to be approximately normal. In the practice, fully normal distributions from sampled data are virtually unlikely to occur. And assuming normality emerges from the joint inspection of the three presented methods.

While univariate normality is assessed by the use of these three approaches, multivariate normality means that the individual variables are normal in a univariate sense and that their combinations are also normal. Notwithstanding, in most cases, assessing and achieving univariate normality for all variables is sufficient. Moreover, large samples tend to diminish the detrimental effects of non-normality. To this regard, sample size has the effect of increasing statistical power by reducing sampling error: in samples as small as 50 or fewer observations—and especially fewer than 30—, significant departures from normality can have a substantial impact on the results. For more than 200 observations, however, the same effects may be negligible. Therefore, as sample sizes become large, the researcher can be less concerned about non-normal variables (Hair Jr. et al., 2006).

3.4.4 Comparing means of different samples

When considering performing the comparison of different groups, some features of these groups have to be inspected prior to selecting the statistical technique. This is required because depending on such features, the statistical technique to be adopted is different. First feature regards the normality of the samples: if there is evidence that data of one sample come from a non-normally distributed population, a non-parametric test has to be employed. Otherwise, a parametric test can be adopted. Martins and Theóphilo (2009) name such non-parametric tests as distribution-free tests because it is not necessary to assume a certain distribution of the populations. In this study, univariate tests of normality are performed in order to identify significant departures from normality and therefore, setting the use of non-parametric tests instead of parametric tests. For details on normality tests of data considered in this study, see item 3.4.3.

The second feature to be analyzed is to which extent the samples are independent or related. Independent sample tests are typically applied when the statistical units underlying the two samples being compared are non-overlapping. Martins and Theóphilo (2009) provide a good example to illustrate a related sample: when the same respondent is subject to two inspections—question A and question B, or the measurement before and after a certain experiment—such resulting samples can be classified as related because the respondent for question A and question B—or for the measurement before and after a certain experiment—is the same. Therefore, as the respondent is the same, several exogenous elements can be expunged. Comparing means of two related samples can be performed using the non-parametric Wilcoxon signed-rank test, which is an extension of the signed-rank test. This test is used when comparing two related samples, matched samples, or repeated measurements on a single sample to assess whether their population mean ranks differ (Kruskal, 1957). The null hypothesis of the signed-rank test is that there is no difference between groups and the alternative hypothesis is that there is difference between groups. The Wilcoxon signed-rank test holds the same null and alternative hypotheses (Wilcoxon, 1945).

When samples are independent—unrelated, non-related—, the most suitable technique is the non-parametric Mann-Whitney test as an alternative to the *t*-test for normal data (Fay, & Proschan, 2010). The null hypothesis of the Mann-Whitney test is that there is no difference between groups and the alternative hypothesis is that there is difference between groups (Martins and Theóphilo, 2009).

Considering data of samples are normally distributed, parametric tests can be performed. In case of independent samples, the well-known unpaired *t*-test can be selected. Among the most frequently applications of *t*-tests is the two-sample location test of the null hypothesis that the means of two populations are equal. All such tests are usually called Student's *t*-tests, though strictly speaking that name should only be used if the variances of the two populations are also assumed to be equal (Zimmerman, 1997). Furthermore, when there are only two means to compare, the *t*-test and the ANOVA—Analysis of Variance—*F*-test are equivalent. An *F*-test is any statistical test in which the test statistic has an *F*-distribution under the null hypothesis.

Finally, the third feature to be inspected is the number of samples to be compared. Generally, there are two decisions regarding this feature: (1) comparing two samples or (2) comparing more than three samples at once. Comparisons involving two samples are often regarded as paired tests, because they provide a direct response on which sample holds a higher mean. On the other hand, comparisons involving three or more samples are limited to indicating the presence of at least one different mean among all samples, without pointing which is the different sample. Commonly, the interest is precisely on the identification of the different sample. In order to achieve this answer, a paired test for all existing pairs is pursued. When performing multiple two-sample *t*-tests, it is expected that higher levels of false positive error—which means rejecting a true null hypothesis—emerge. For this reason, the one-way ANOVA test is useful in comparing three or more means for statistical significance. Both *t*-tests and ANOVA assume normality of data (Martins, & Theóphilo, 2009).

When data show significant departures from normality, the non-parametric Kruskal-Wallis test is used to compare three or more independent samples. The null hypothesis is that means of all groups are equal and the alternative hypothesis is that there is at least one different pair. When the Kruskal-Wallis test (Kruskal, & Wallis, 1952) leads to significant results, then at least one of the samples is different from the other samples. The test does not identify where the differences occur or how many differences actually occur (Spurrier, 2003).

Table 28, next, unveils a summary of which test to employ to compare means of different samples, regarding: (1) normal distributed versus non-normal distributed samples, (2) independent versus related samples, and (3) two samples versus three or more samples.

Table 28 – Tests for comparing means regarding normality, independence, and number of variables

	2 variables independent samples	**3+ variables independent samples**	**2 variables related samples**
parametric test	unpaired *t*-test ANOVA F-test	one-way ANOVA	paired *t*-test
non-parametric test	Mann-Whitney U test	Kruskal-Wallis	Wilcoxon singed-rank

Source: based on Martins and Theóphilo (2009).

In this study, comparison of means is employed twice: first, to compare means of importance of innovation drivers; then, to compare means of practice of innovation drivers. In both cases, for each variable, samples are related, as the respondent for every question is the same. Tests of normality have to take place: if data show significant departures from normality, the non-parametric Wilcoxon singed-rank is appropriate; otherwise, the paired *t*-test is selected. First, for identifying the most important innovation driver—SG1—, a simple mean calculation for each of the 21 innovation drivers is followed by a sort in descending order. Next, the technique for comparing means is deployed to compare the variable with the highest mean with the one with the second highest mean. As a result, the technique indicates whether there is evidence that means are significantly different and, in this case, it is possible to assume that the variable with the highest means is indeed considered more important than the other. If statistical difference is not significant, then there is no room to affirm that variables differ from each other in terms of the statistical viewpoint. The same rationale is adopted for the purpose of identifying the most practiced innovation drivers—SG3.

Figure 13, as follows, retrieves the relations between the questionnaire and the specific goals of the present study, and highlights the specific goals that are achieved through the technique of comparing means—SG1 and SG3.

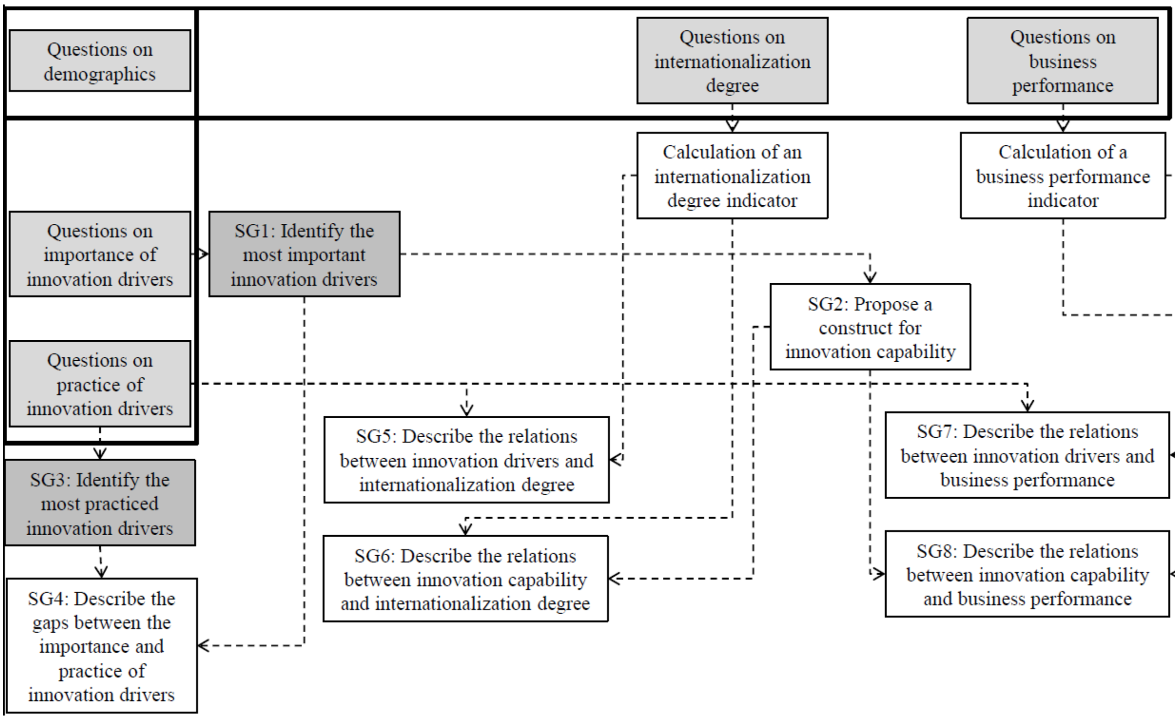

Figure 13 – Comparing means is a suitable technique for answering SG1 and SG3

3.4.5 Proposing a construct for innovation capability

SG1 identifies the most important innovation drivers and considering such outcomes, there is now room to progress with the development of SG2: a proposal of a construct for innovation capability.

This study proposes a construct for innovation capability in two different ways: (1) first, theoretical, in which the construct is a weighted mean regarding the general importance of each innovation driver, and (2) second, also theoretical, but in which the construct is a weighted mean regarding the loadings of importance of each innovation driver relative to the corresponding innovation factor. In terms of methods, (1) uses a mathematical weighted mean concept and (2) resorts the exploratory factor analysis, EFA. Details are provided next.

3.4.5.1 Innovation capability construct: a weighted mean of innovation drivers

According to the conceptual model of innovation drivers, the innovation capability construct encompasses five innovation dimensions depicted in the literature review, say: (1) resources, (2) processes, (3) culture, (4) organization, and (5) external environment.

Figure 14, next, presents a summary of the conceptual relations of innovation drivers, innovation dimensions, and innovation capability.

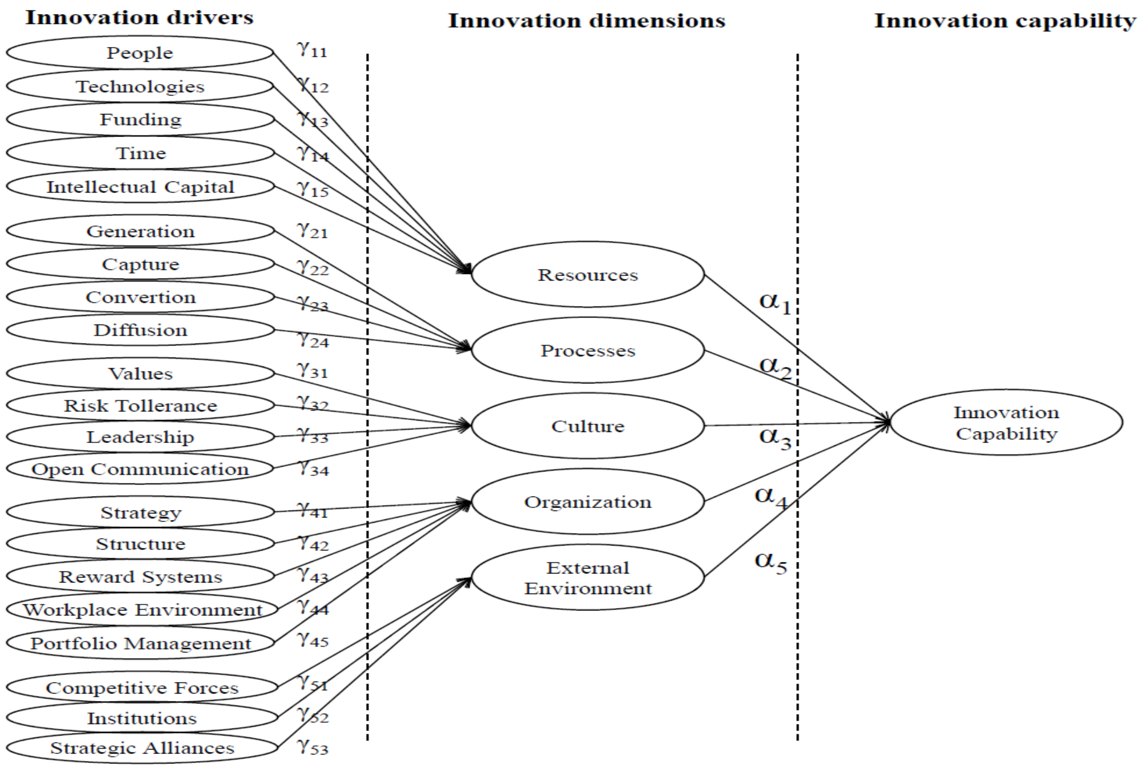

Figure 14 – The conceptual relations between innovation drivers, innovation dimensions, and innovation capability

Innovation capability is not a single mean of innovation dimensions rather it is a weighted mean of innovation dimensions. Likewise, each innovation dimension is a weighted mean of innovation drivers.

The construct of the innovation capability is a result of the contributions of each innovation dimension. To imprint a more realistic vision of the innovation capability, it is fair to consider that not all innovation dimensions have the same effect on the innovation capability. Therefore, the proposed construct suggests the innovation capability as a weighted mean of the innovation dimensions:

$$innovation\ capability = \alpha_1 * (resources) + \alpha_2 * (processes) + \alpha_3 * (culture) + \alpha_4 * (organization) + \alpha_5 * (external\ environment)$$

The sum of the individual contribution of each innovation dimension totals 100%, thus the sum of all α_i must be 1, where $1 \leq i \leq 5$:

$$\sum_{i=1}^{5} \alpha_i = 1$$

Likewise, each innovation dimension itself can be developed as a function of the contributions of certain innovation drivers. Such drivers were depicted from literature and the construct of the resources dimension combines the contributions of: (1) people, (2) technologies, (3) funding, (4) time, and (5) intellectual capital, as:

$$resources = \gamma_{11} * (people) + \gamma_{12} * (technologies) + \gamma_{13} * (financial) + \gamma_{14} * (time) + \gamma_{15} * (intellectual\ capital)$$

where: $\gamma_{11} + \gamma_{12} + \gamma_{13} + \gamma_{14} + \gamma_{15} = 1$

The processes dimension encompasses (6) generation, (7) capture, (8) conversion, and (9) diffusion as innovation drivers, as:

$$processes = \gamma_{21} * (generation) + \gamma_{22} * (capture) + \gamma_{23} * (conversion) + \gamma_{24} * (diffusion)$$

where: $\gamma_{21} + \gamma_{22} + \gamma_{23} + \gamma_{24} = 1$

The culture dimension is a function of (10) values, (11) risk management, (12) leadership, and (13) open communication, as:

$$culture = \gamma_{31} * (values) + \gamma_{32} * (risk\ management) + \gamma_{33} * (leadership) + \gamma_{34} * (open\ communication)$$

where: $\gamma_{31} + \gamma_{32} + \gamma_{33} + \gamma_{34} = 1$

The combination of (14) strategy, (15) structure, (16) reward systems, (17) workplace environment, and (18) portfolio management provides the construct of the organization dimension of innovation, as:

$$organization = \gamma_{41} * (strategy) + \gamma_{42} * (structure) + \gamma_{43} * (reward\ systems) + \gamma_{44} * (workplace\ environment) + \gamma_{45} * (portfolio\ management)$$

where: $\gamma_{41} + \gamma_{42} + \gamma_{43} + \gamma_{44} + \gamma_{45} = 1$

Finally, the external environment dimension is described as a function of (19) competitive forces, (20) institutions, and (21) strategic alliances, as:

$$external\ environment = \gamma_{51} * (competitive\ forces) + \gamma_{52} * (institutions) + \gamma_{53} * (strategic\ alliances)$$

where: $\gamma_{51} + \gamma_{52} + \gamma_{53} = 1$

For all dimensions, the total contribution of innovation drivers pertaining to that dimension is 100%. Next, considering the contribution of a given innovation dimension to the innovation capability—α—and the contribution of a given innovation driver to the innovation dimension it belongs to—γ—, a contribution of each innovation driver to the innovation capability can be calculated—δ, as:

$$\delta_{ij} = contribution\ of\ dimension\ i\ on\ innovation\ capability * contribution\ of\ driver\ j\ on\ innovation\ dimension$$

In practical terms, δ is a function of α and γ, as:

$$\delta_{ij} = \alpha_i * \gamma_{ij}$$

The sum of the individual contribution of each innovation driver for the innovation capability totals 100%, thus the sum of all δ_{ij} must be 1, where *i* represents the innovation dimension and

j the innovation driver. Therefore, $1 \le i \le 5$; if $i = 1$, then $j = 5$; if $i = 2$, then $j = 4$; if $i = 3$, then $j = 4$; if $i = 4$, then $j = 5$; and if $i = 5$, then $j = 3$.

$$\sum_{i,j=1}^{i=5,j=5} \delta_{ij} = 1$$

Where: If $i = 1$, then $j = 5$;

If $i = 2$, then $j = 4$;

If $i = 3$, then $j = 4$;

If $i = 4$, then $j = 5$; and

If $i = 5$, then $j = 3$.

Figure 15, as follows, portrays a pictorial representation of the contributions of innovation drivers towards innovation capability.

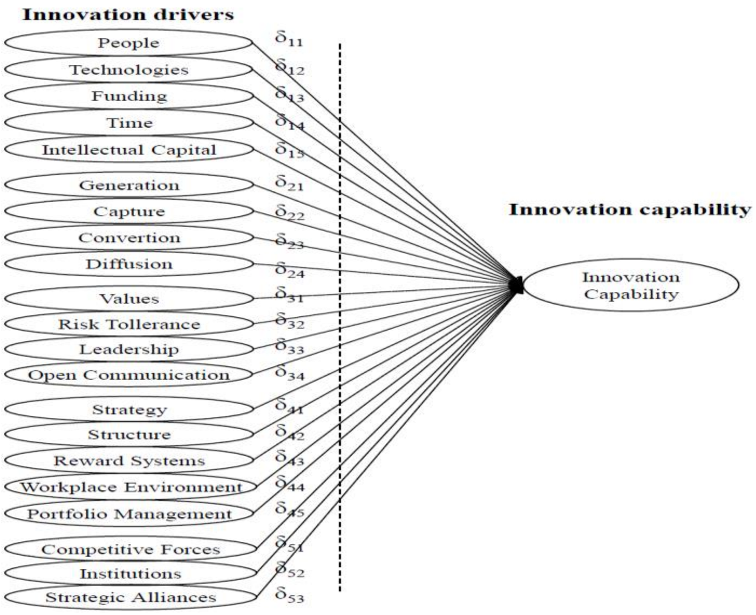

Figure 15 – The conceptual relations between innovation drivers and innovation capability

From the conceptual level to the empirical level, all contributions are calculated in terms of the importance mean of each innovation driver. The contribution of each innovation driver towards an innovation dimension is the importance mean of that driver in relation to the sum of importance mean of all drivers that compose that dimension. It can be depicted as the relative weight of a certain innovation driver when compared to all drivers that compose an innovation dimension: the higher the importance of the innovation driver, the stronger the weight of that driver on the composition of the innovation dimension.

$$\gamma_{ij} = \frac{I_{ij}}{\sum_{j=1}^{5} I_{ij}}$$

where i is fixed for each innovation dimension—assuming i = 1 for resources, i = 2 for processes, i = 3 for culture, i = 4 for organization, and i = 5 for external environment. I is the mean of importance. j is the index of innovation driver being assessed.

Likewise, the contribution of each innovation dimension towards innovation capability is the sum of importance means of all innovation drivers that pertain to that innovation dimension related to the sum of importance means of all innovation drivers, as:

$$\alpha_i = \frac{\sum_{j=1}^{5} I_{ij}}{\sum_{i=1,j=1}^{5} I_{ij}}$$

Again, i is fixed for each innovation dimension. I is the mean of importance. j is the index of innovation driver being assessed.

3.4.5.2 Innovation capability construct: a weighted mean of innovation factors

Factor analysis is an interdependency technique whose primary purpose is to define the underlying structure among the variables in the analysis. It provides the tools for analyzing the structure of the interrelationships (correlations) among a large number of variables by defining sets of variables that are highly interrelated (factors). These factors are assumed to represent dimensions within the data. If there is a conceptual basis for understanding the relationships between variables, then the relations may actually have meaning for what they collectively represent (Hair Jr. et al., 2006). If the objective is to summarize the characteristics, factor analysis would be applied to a correlation matrix of the variables. It is possible not only to estimate the factors but also the contributions of each variable to the factors (loadings).

Contributions of Hair Jr. et al (2006) are immense in terms of concepts and guidelines for the factor analysis applied to business research and the following text derive from the authors.

In terms of samples, size with fewer than 50 observations are ineligible for factor analysis and, as general rule, the minimum is to have at least five times as many observations as the number of variables to be analyzed, and the more acceptable sample size would have a 10:1 ratio. In this study, 21 variables are inspected. Therefore, a sample of more than 210 is desired for this study.

It is necessary to ensure that the variables are sufficiently intercorrelated to produce representative factors. This degree of interrelatedness can be assessed from both overall and individual variable perspectives. If visual inspection of the correlation matrix indicates no substantial number of correlations greater than .30, then factor analysis is probably inappropriate. Another method of determining the appropriateness of factor analysis examines the entire correlation matrix. The Bartlett test of sphericity is a statistical test for the presence of correlations among the variables. It provides the statistical significance that the correlation matrix has significant correlations among at least some of the variables. The correlation matrix and the Bartlett test of sphericity are calculated and inspected for the purposes of this study.

Principal component analysis is used when the objective is to summarize most of the original information in a minimum number of factors for prediction purposes. This technique is most appropriate when data reduction is a primary concern, focusing on the minimum number of factors needed to account for the maximum portion of the total variance represented in the original set of variables. The method of component analysis is adopted for this study.

Any individual factor should account for the variance of at least a single variable if it is to be retained for interpretation. With component analysis, each variable contributes a value of 1 to the total latent roots (eigenvalues). Thus, only the factors having eigenvalues greater than 1 are considered significant. The use of the eigenvalue criterion for establishing a cutoff is most reliable when the number of variables is between 20 and 50, which is the case of this study.

Next concept regards factor rotation, which is perhaps the most important tool in interpreting factors. The ultimate effect of rotating the factor matrix is to redistribute the variance from earlier factors to later ones to achieve a simpler, theoretically more meaningful factor pattern. The simplest case of rotation is an orthogonal factor rotation, in which the axes are maintained at 90 degrees. It is also possible to rotate the axes and not retain the 90-degree angle between the reference axes. When not constrained to being orthogonal, the rotational procedure is named an oblique factor rotation. The same general principles of orthogonal rotations pertain to oblique rotations, which is more flexible and more realistic because the theoretically important underlying dimensions are not assumed to be uncorrelated with each other. Orthogonal rotation methods encompass: (1) QUARTIMAX rotation, (2) VARIMAX rotation, and (3) EQUIMAX rotation. The goal of QUARTIMAX is to simplify the rows of a factor matrix, while the VARIMAX centers on simplifying the columns of the factor matrix. EQUIMAX is a compromise between QUARTIMAX and VARIMAX and tries to simplify both rows and columns of the factor matrix. In the practice, the most used orthogonal rotation method is VARIMAX. Oblique rotation methods are similar to orthogonal rotations, except that oblique rotations allow correlated factors instead of maintaining independence between the rotated factors. For the purposes of this study, OBLIMIN is the oblique rotation method available in SPSS— Statistical Package for Social Science—and therefore used as rotation method.

The first step to ensure practical significance is a preliminary examination of the factor matrix in terms of the factor loadings, which is the correlation of the variable and the factor. Thus, the larger the absolute size of the factor loading, the more important is the loading in interpreting the factor matrix. For sample sizes of 100 or more, loadings can be assessed as:

- Factor loadings in the range of ±.30 to ±.40 are considered to meet the minimal level for interpretation of structure;
- Loadings ±.50 or greater are considered practically significant; and
- Loadings exceeding .70 are considered indicative of well-defined structure.

Hair Jr. et al. (2006) propose samples sizes necessary for each factor loading value to be considered significant with a power level of 80 per cent and a significance level of .05. Table 29, as follows, exhibits the guidelines for identifying significant factor loadings based on sample size.

Table 29 – Guidelines for identifying significant factor loadings based on sample size

Factor loading	Sample size
.30	350
.35	250
.40	200
.45	150
.50	120
.55	100
.60	85
.65	70
.70	60
.75	50

Source: Hair Jr. et al. (2006).

For the purposes of this study, a threshold of ±.40 for factor loadings was adopted.

In the case of oblique rotation, two matrices of factor loadings are provided. The first is the factor pattern matrix, which has loadings that represent the unique contribution of each variable to the factor. The second is the factor structure matrix, which has simple correlations between variables and factors, but these loadings contain both the unique variance between variables and factors and the correlation among factors. As the correlation among factors becomes greater, it becomes more difficult to distinguish which variables load uniquely on each factor in the factor structure matrix. Therefore, it is preferable to report the results of the factor pattern matrix, which is the procedure adopted in this study.

Next step is to identify the significant loading for each variable. The interpretation should start with the first variable on the first factor and move horizontally from left to right, looking for the highest loading for that variable on any factor. When the largest absolute factor loading is identified, it should be underlined. This procedure should continue for each variable until all variables have been reviewed for their highest loading on a factor.

When one variable each has moderate-size loadings on several factors, all of which are significant, it is termed cross-loading. Cases of cross-loadings are subject to deletion. Another potential problem occurs when a variable lacks at least one significant loading. In such cases, again, the variable is discarded.

It is important to understand how much of a variable's variance is shared with other variables in a factor. Common variance is that variance shared with all other variables in the analysis. This variance is accounted for based on a variable's correlations with all other variables. A variable communality is the estimate of its shared variance among the variables as represented by the derived factors. Communality of a variable is the amount of variance accounted for by the factor solution for each variable. Inspecting communalities helps in assessing whether the variables meet acceptable levels of explanation. This study adopts the threshold of .50 for a variable's communality, which means that values less than .50 for communality do not have sufficient explanation.

When an acceptable factor solution has been obtained in which all variables have a significant loading on a factor, it is adequate to assign some meaning to the pattern of factor loadings. Variables with higher loadings are considered more important and have greater influence on the label selected to represent a factor. The labels are intuitively developed on its appropriateness for representing the underlying dimensions of a particular factor. The final result will be the label that represents each of the derived factors as accurately as possible.

After achieving a final solution, a construct for the innovation capability can be derived. As factor loadings represent the relevance of each variable to the corresponding factor and of each factor to the final result, the same rationale adopted to calculate a weighted mean of importance of innovation drivers remains. However, the so-called innovation dimensions are now the innovation factors, and innovation capability is the final result of the factor analysis. The higher the importance of the innovation driver—measured now in terms of loadings—, the stronger the weight of that driver on the composition of the innovation dimension, as:

$$\gamma_{ij} = \frac{L_{ij}}{\sum_{j=1}^{n} L_{ij}}$$

where i is fixed for each innovation factor—resulting from the factor analysis. L is the factor loading. j is the index of innovation driver being assessed. n is the number of innovation drivers that compose the innovation factor.

Likewise, the contribution of each innovation factor towards innovation capability is the sum of loadings of all innovation drivers that pertain to that innovation factor related to the sum of loadings of all innovation drivers, as:

$$\alpha_i = \frac{\sum_{j=1}^{n} L_{ij}}{\sum_{i=1,j=1}^{m} L_{ij}}$$

Again, *i* is fixed for each innovation factor. *n* is the number of innovation drivers that compose the innovation factor. *m* is the total number of innovation drivers.

In practical terms, *δ*, which is the contribution of each innovation driver towards innovation capability, is a function of *α* and *γ*, as:

$$\delta_{ij} = \alpha_i * \gamma_{ij}$$

i is the index of the innovation factor. *j* is the index of the innovation driver.

Figure 16, next, exhibits the relations between the questionnaire and the specific goals of the present study, and highlights the specific goals that are achieved through the technique of exploratory factor analysis—SG2.

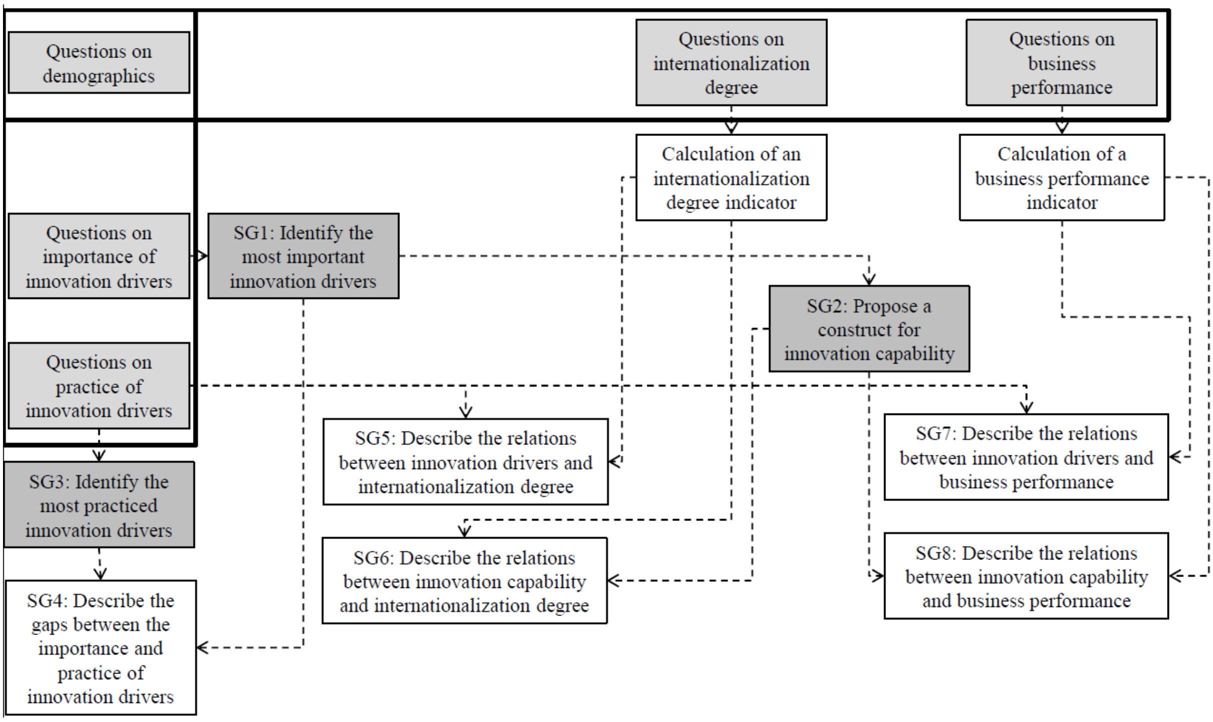

Figure 16 – Exploratory factor analysis is a suitable technique for answering SG2

3.4.6 Identifying the associations of two variables

SG1 identifies the most important innovation drivers and SG3 the most practiced innovation drivers. Considering the outcomes from both, there is now room to progress with the development of SG4: describe the gaps between the importance and practice of innovation drivers.

Associations of two variables can be described through the use of a number of different statistical techniques—each seeking for different goals. Scatterplots, correlation, bivariate regression, and cluster analysis are representative of these tools. In order to identify the associations of two variables—in this case, importance of innovation drivers and practice of innovation drivers—, scatterplot and cluster analysis are used to respond to SG4. Details are provided next.

3.4.6.1 Visual inspection: the scatterplot

The scatterplot is considered the most popular method for examining bivariate relationships. A scatterplot is a two-dimensional graph where dots corresponding to values of abscissae and ordinates are plotted. Taking a look at a scatterplot, it is possible to depict the nature of the relation between both variables (Martins, & Theóphilo, 2009). Coopers and Schindler (2006) highlight the scatterplot is essential to understand the relation between the variables. Hair Jr. et al. (2006) emphasize the useful role of scatterplot in identifying outliers of bivariate relations. For details, see item 3.4.2.

The visual inspection may directly uncover direction and magnitude of the relation. A positive direction indicates that the higher the values of one of the variables, the higher are the values of the other variable. Oppositely, a negative direction indicates the higher the values of one of the variable, the lower are the values of the other variable. If one can depict an imaginary straight line to represent the set of dots in the scatterplot, an upward line denotes a positive relation and a downward line a negative relation.

Regarding magnitude, strong relations are represented by dots in the scatterplot sticking to the imaginary straight line that represent the set of dots. Otherwise, weak relations are represented by a more scattered set of dots with dots farther from the line.

3.4.6.2 Cluster analysis

Cluster analysis is a technique whose primary purpose is to group objects based on the characteristics they possess (Coopers, & Schindler, 2006). The resulting groups—clusters—of objects should exhibit high internal (within-cluster) homogeneity and high external (between-cluster) heterogeneity.

The first task is developing some measure of similarity—which represents the degree of correspondence among objects across all of the characteristics used in the analysis—between each object to be used in the clustering process. The most commonly used measures of similarity are distance measures, which represent similarity as the proximity of observations to one another across the variables. Some distance measures include (Hair Jr. et al., 2006):

- Euclidian distance: is the most commonly recognized measure of distance and is the length of the hypotenuse of a right triangle;
- Squared Euclidian distance: is the sum of the squared differences without taking the square root. It is the recommended distance measure for the Centroid and Ward's methods of clustering;

- City-block distance: uses the sum of the absolute differences of the variables. It is the simplest to calculate, but may lead to invalid clusters if the clustering variables are highly correlated;
- Chebychev distance: distance is the greatest difference across all of the clustering variables. It is particularly susceptible to differences in scales across the variables; and
- Mahalanobis distance D^2: is a generalized distance measure that accounts for the correlations among variables in a way that weights each variable equally. It also relies on standardized variables.

Next step includes selecting a cluster algorithm that defines how similarity is defined between multiple-member clusters in the clustering process. Among numerous approaches, the five most popular agglomerative algorithms are (Hair Jr. et al., 2006):

- Single-linkage: defines the similarity between clusters as the shortest distance from any object in one cluster to any object in the other;
- Complete-linkage: cluster similarity is based on maximum distance between observations in each cluster. Similarity between clusters is the smallest sphere that can enclose all observations in both clusters;
- Average linkage: similarity is the average similarity of all individuals in one cluster with all individuals in another. It tends to generate clusters with small within-cluster variation and resulting clusters are approximately equal within-group variance;
- Centroid method: similarity is the distance between the cluster centroids, which is the mean values of the observations on the variables. This method may produce messy and often confusing results; and
- Ward’s method: similarity is not a single measure of similarity, but rather the sum of squares within the clusters summed over all variables. The selection of which clusters to combine is based on which combination minimizes the within-cluster sum of squares across the complete set of disjoint clusters. It tends to produce cluster with approximately the same number of observations.

For details on distance measures and clustering algorithm, see Hair Jr. et al. (2006).

For the purposes of this study, the Ward's linkage and the Euclidian distance are acceptable and they were eventually adopted. Statistics are based on cases with no missing values for any variable used.

Figure 17 portrays the relations between the questionnaire and the specific goals of the present study, and highlights the specific goals that are achieved through the technique of cluster analysis—SG4.

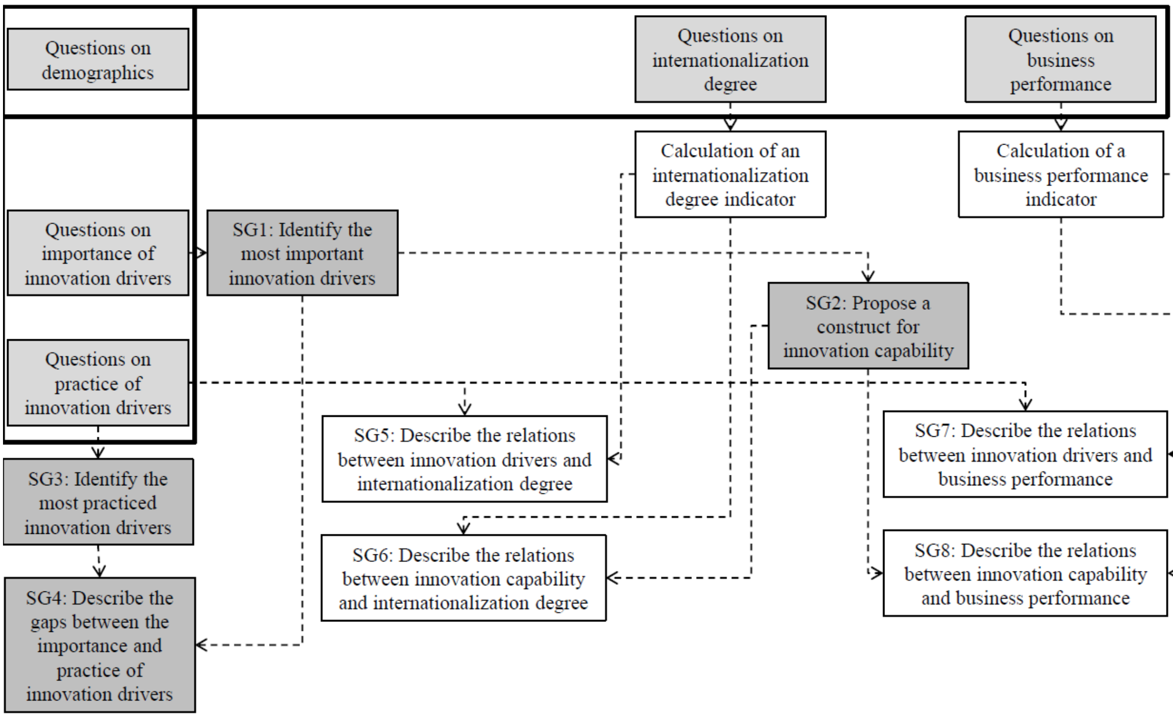

Figure 17 – Cluster analysis is a suitable technique for answering SG4

3.4.7 Describing the relations between variables: one way dependency

Finally, the last part of the study encompasses the specific goals—SG5, SG6, SG7, and SG8—that lead to the overall objective, which is describing a relation (1) between innovation and internationalization and (2) between innovation and business performance.

In terms of empirical procedures, two constructs serve as proxies for innovation: (1) innovation drivers and (2) innovation capability. Moreover, internationalization indicators are the proxies for internationalization and business performance indicators are the proxies for business performance.

Innovation drivers comprise 21 input variables from the practice of such drivers. Innovation capability—1 input variable—is a weighted mean of some innovation drivers. There are six internationalization indicators—6 output variables—and a single mean of them constitute the internationalization degree—1 output variable. There are eight business performance indicators—8 output variables—and a single mean of them constitute the business performance—1 output variable.

Therefore, SG5 describes the relations innovation drivers (21 input variables) and internationalization degree (6 + 1 output variables); SG6 describes the relations between innovation capability (1 input variable) and internationalization degree (6 + 1 output variables); SG7 describes the relations between innovation drivers (21 input variables) and business performance (8 + 1 output variables); and SG8 describes the relations between innovation capability (1 input variable) and business performance (8 + 1 output variables).

In order to meet these expectations of the specific goals, the technique of linear regressions is adequate. For SG5 and SG7, multiple linear regression is used, while SG6 and SG8 require simple linear regression. Details are provided next.

3.4.7.1 Simple linear regression (SLR)

While studying a simple linear regression, SLR—but also regarded as bivariate regression—, two variables are considered: one is dependent—because it depends on others, and often understood as the output, the effect of the relation, or is tested to see if it is really the effect—and the other is independent—often known as the input, the cause of the relation, or tested to see if is really the cause. Primary use of regression is predicting the dependent variable as a function of the independent variable (Martins, & Theóphilo, 2009). A straight line is fundamentally the best way to model the relation of two continuous variables (Coopers, & Schindler, 2008). Thus, the bivariate linear regression is expressed as:

$$Y = \beta_0 + \beta_1 * X$$

The value of the dependent variable Y is a linear function of the corresponding value of the independent X variable. β_0 and β_1 are knows as the regression coefficients. β_1 is the change in Y to an unitary change in X, as follows:

$$\beta_1 = \frac{\Delta y}{\Delta x}$$

β_0 is the constant, the intercept, and represents the value of the linear function when the straight line intersect the *Y* axis. This is an estimation for *Y* when $X = 0$. β_0 can be represented by the mean values of *X* and *Y*, respectively $\dot{X}$ and $\dot{Y}$:

$$\beta_0 = \dot{Y} - \beta_1 * \dot{X}$$

The regression coefficient denotes the relative contribution of the independent variable towards the overall prediction and facilitates interpretation as to the influence of this independent variable in making the prediction (Hair Jr. et al., 2006).

The first indicator for assessing the outputs of a regression is the Pearson's correlation coefficient (*r*) which reveals the direction and magnitude of the relations. Direction means that high values of one variable are associated to high values of the other variable: this is a positive relation. Magnitude refers to the extent to which variables stick together. Pearson's correlation coefficient close to 1.0 indicates similar behavior of the variables (Coopers, & Schindler, 2008).

Next indicator for assessing the outputs of a regression is the coefficient of determination (R^2), which is the ratio of the sum of squares regression to the total sum of squares. It is a way to express the level of prediction accuracy and represents: the combined effect of the entire variate in prediction, even when the regression equation contains more than one independent variable. R^2 regards the variation of the dependent variable and the value of 1.0 indicates the regression model predicts the dependent variable (Hair Jr. et al., 2006).

3.4.7.1 Multiple linear regression (MLR)

Multiple linear regression, MLR, is an extension of the simple linear regression in terms of the number of independent variables. While the simple linear regression assumes only one independent variable describing one dependent variable, multiple linear regression admits several independent variables as descriptors of one dependent variable, as:

$$Y = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \dots + \beta_n * X_n$$

The underlying concept of the coefficients present in the SLR lingers for the purposes of MLR: they represent the amount of variable Y that varies when a unitary variation in variable X when all other X variables remain constant, *ceteris paribus* (Coopers, & Schindler, 2008).

In MLR, the problem of multicolinearity is severe. Multicolinearity occurs when two or more of the independent variables are highly correlated (about .80). When it happens, the coefficients of the regression may float a lot from one sample to another and their interpretation turns to be risky. There are two possible options for handling this shortcoming: (1) choose one variable and exclude the other and (2) create a new variable that be a composite of all highly intercorrelated and use it instead of the others (Cooper, & Schindler, 2008).

Figure 18 is a portrayal of the relations between the questionnaire and the specific goals of the present study, and highlights the specific goals that are achieved through the technique of linear regression—SG5, SG6, SG7, and SG8.

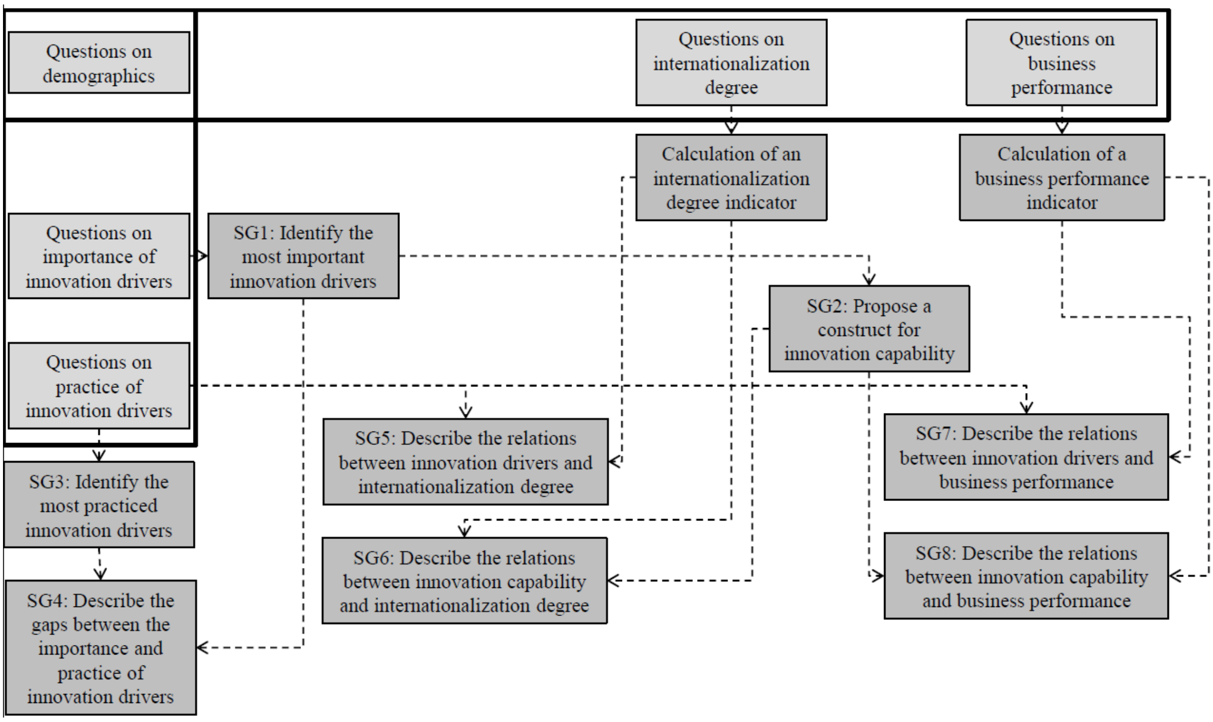

Figure 18 – Linear regression is a suitable technique for answering SG5, SG6, SG7, and SG8

4 RESULTS AND ANALYSES

According to the methodological procedures depicted previously, the field research was conducted entirely in Brazil and aimed at responding to these general objectives: (1) describe the relations between innovation and internationalization and (2) describe the relations between innovation and business performance.

Such general objectives were unfolded into eight specific goals, each demanding a certain combination of concepts and statistical techniques, but all goals interrelated with each other. Such specific goals include:

- SG1: Identifying the most important innovation drivers;
- SG2: Proposing a measurable construct for the innovation capability of a company;
- SG3: Identifying the most practiced innovation drivers;
- SG4: Describing the gaps between the importance and the practice of innovation drivers.
- SG5: Describing the relations between innovation drivers and internationalization degree;
- SG6: Describing the relations between innovation capability and internationalization degree;
- SG7: Describing the relations between innovation drivers and business performance; and
- SG8: Describing the relations between innovation capability and business performance.

In order to provide each specific goal with a clear response, this chapter is unfolded into eight items, each representing a specific goal. All needed calculations and statistics were performed through the use of MS-Excel, version 2010, spreadsheets and the statistical package of SPSS, version 20.0.1.

4.1 Identifying the most important innovation drivers

The first hypothesis of this study is described as follows. This hypothesis was tested through the use of the statistical technique of mean comparison:

Hypothesis 1 (conceptual level)

Innovation drivers would be not equally important for a company to innovate.

Hypothesis 1 (empirical level)

Compared to others, one or more innovation drivers would show higher means of importance for a company to innovate.

4.1.1 Describing collected data

A total of 528 filled questionnaires were received, each representing a different respondent. For the purposes of this part of the study, the unit of analysis is the respondent—considered representative of Brazilian executives.

Reliability statistics on the 21 importance variables include: (1) Cronbach's alpha of .855 and (2) Cronbach's alpha based on standardized items of .859. Therefore data can be considered reliable and statistical tests can be performed.

Figure 19, next, shows the sample distribution regarding age of respondents.

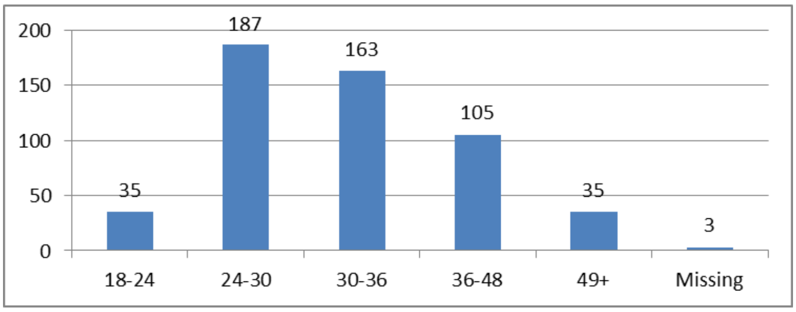

Figure 19 – Frequency of age of respondents

Respondents are relatively young in terms of age, which reflects the profile of graduate programs being held in Brazil. Only 26.52% of respondents are 36 or older. Table 30, next, shows the precise frequencies, both with and without missing data.

Table 30 – Frequency of age of respondents, with and without missing data

Age	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
18-24	35	6.63%	6.67%
24-30	187	35.42%	35.62%
30-36	163	30.87%	31.05%
36-48	105	19.89%	20.00%
49+	35	6.63%	6.67%
Missing	3	0.57%	
Total	528	100.00%	100.00%

Figure 20, next, presents the distribution of the sample regarding gender of respondents.

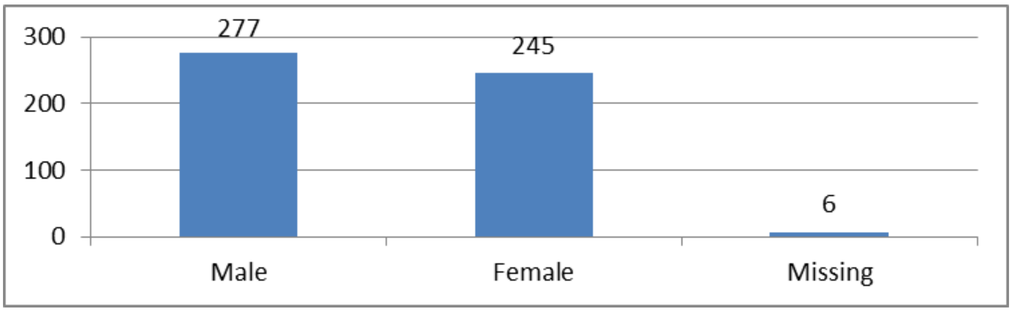

Figure 20 – Frequency of gender of respondents

Males and females hold a fairly balanced distribution with respectively 52.46% and 46.40%. Table 31, next, shows the precise frequencies, both with and without missing data.

Table 31 – Frequency of gender of respondents, with and without missing data

Gender	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Male	277	52.46%	53.07%
Female	245	46.40%	46.93%
Missing	6	1.14%	
Total	528	100.00%	100.00%

Figure 21, next, presents the distribution of the sample regarding highest academic degree of respondents.

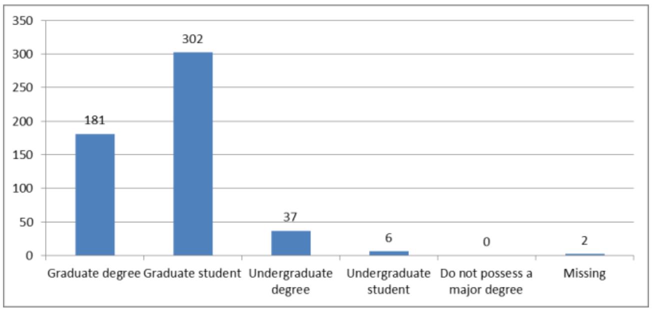

Figure 21 – Frequency of highest academic degree of respondents

A majority of 91.48% of respondents is either graduate students or they already possess a graduate degree, which is convergent with the adopted field procedures. Table 32, next, shows the precise frequencies, both with and without missing data.

Table 32 – Frequency of highest academic degree of respondents, with and without missing data

Highest academic degree	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Graduate degree	181	34.28%	34.41%
Graduate student	302	57.20%	57.41%
Undergraduate degree	37	7.01%	7.03%
Undergraduate student	6	1.14%	1.14%
Do not possess a major degree	0	0.00%	0.00%
Missing	2	0.38%	
Total	528	100.00%	100.00%

Figure 22, next, presents the distribution of the sample regarding current position in the company of respondents.

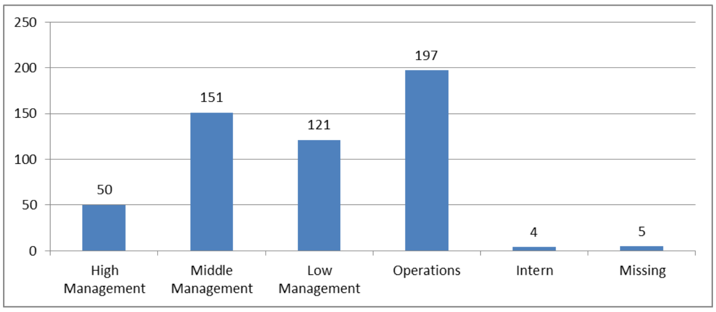

Figure 22 – Frequency of position in the company of respondents

A minority of 38.07% holds a title of middle management or higher. Table 33, next, shows the precise frequencies, both with and without missing data. Again, this distribution may reflect the profile of students in the Brazilian higher education. However, having a majority of respondents occupying low management and operational duties is of a concern, since their influence in terms of decision making is limited. To this regard, profile of respondents is a limitation of this study.

Table 33 – Frequency of position in the company of respondents, with and without missing data

Position in the company	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
High Management	50	9.47%	9.56%
Middle Management	151	28.60%	28.87%
Low Management	121	22.92%	23.14%
Operations	197	37.31%	37.67%
Intern	4	0.76%	0.76%
Missing	5	0.95%	
Total	528	100,00%	100,00%

Figure 23, next, shows the distribution of the sample regarding current department to which the respondent belongs.

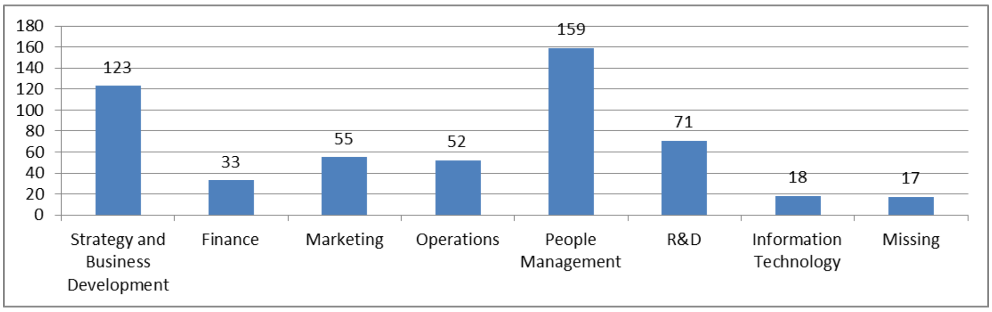

Figure 23 – Frequency of department in the company of respondents

More than half of the sample belongs to (1) Strategy and Business Development (23.30%) or (2) People Management (30.11%), accounting a total of 53.41% of respondents. A 13.45% of respondents belonging to the R&D department—Research and Development—is of interest for the purposes of this study, since the subject being inspected regards innovation and its underlying relations with internationalization and business performance. Another timely remark is that some respondents claimed not to have their department represented in the given alternatives—for example, sales or commercial department, legal department, relationship with investors, compliance, etc. For these cases, respondents were asked to assign the closest department according to given alternatives and respondents' judgment. As this is not a critical question in terms of findings, no further unrest is to be casted.

Table 34, next, shows the precise frequencies, both with and without missing data.

Table 34 – Frequency of department in the company of respondents, with and without missing data

Department	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Strategy and Business Development	123	23.30%	24.07%
Finance	33	6.25%	6.46%
Marketing	55	10.42%	10.76%
Operations	52	9.85%	10.18%
People Management	159	30.11%	31.12%
R&D	71	13.45%	13.89%
Information Technology	18	3.41%	3.52%
Missing	17	3.22%	
Total	528	100.00%	100.00%

4.1.2 Detecting and handling missing data

A total of 32 missing data was detected. Distribution of such missing data is shown in Table 35, next.

Table 35 – Frequency of missing data regarding importance variables

Missing data of innovation driver importance variables					
IMPT_01	0	IMPT_08	1	IMPT_15	3
IMPT_02	0	IMPT_09	1	IMPT_16	1
IMPT_03	2	IMPT_10	2	IMPT_17	3
IMPT_04	1	IMPT_11	0	IMPT_18	4
IMPT_05	2	IMPT_12	1	IMPT_19	4
IMPT_06	0	IMPT_13	0	IMPT_20	4
IMPT_07	0	IMPT_14	0	IMPT_21	3

Missing datum or data of a single variable did not led to the discard of other data of the same respondent because variables were handled separately—in terms of mean calculation.

Possible reasons for the emergence of missing data include (1) partial or no understanding of the proposed question and (2) unwillingness of the respondent to provide an answer to that question. Partial or no understanding of the proposed questions may have derived from inaccurate wording, albeit all the efforts in terms of content validation. Therefore, as the questionnaire was subjected to external validation, these missing data can be negligible for the purposes of this study.

4.1.3 Detecting and handling univariate outliers

The method of standardized scores was used to detect outliers and score values exceeding the threshold of ±3 were considered outliers (Martins & Theóphilo, 2009). An MS-Excel spreadsheet was deployed to perform the calculations of the standardized scores (for details, see item 3.4.2). A total of 156 outliers was detected. Distribution of such outliers is shown in Table 36, next.

Table 36 – Frequency of outliers regarding importance variables

Outliers of innovation driver importance variables					
IMPT_01	10	IMPT_08	7	IMPT_15	7
IMPT_02	8	IMPT_09	7	IMPT_16	11
IMPT_03	7	IMPT_10	10	IMPT_17	7
IMPT_04	10	IMPT_11	7	IMPT_18	0
IMPT_05	7	IMPT_12	9	IMPT_19	6
IMPT_06	9	IMPT_13	9	IMPT_20	7
IMPT_07	3	IMPT_14	7	IMPT_21	8

Outliers of a single variable did not led to the discard of other data of the same respondent because variables were handled separately—in terms of mean calculation.

4.1.4 Performing univariate normality tests

Three methods were performed in order to test the univariate normality of data. The first included the visual analysis of histogram, normal Q-Q plot, and Boxplot (generally this set is regarded as the graphical analysis of normality). The second method included two specific statistical tests for normality: the Shapiro-Wilk test (Razali & Wah, 2011, Shapiro & Wilk, 1965) and a modification of the Kolmogorov-Smirnov test (considering the Lilliefors significance correlation). Finally, the third method assessed normality based on the skewness and kurtosis values, according to the formulas and thresholds explained in the methodological procedures (for details, see item 3.4.3).

Normality tests were performed for each variable independently and detailed results are shown in Appendices 05 to 25.

In most cases, several departures from normality were observed through the graphical analysis. In general terms, histograms were negatively skewed—a rightward shift—denoting the bias of higher grades for the importance of innovation drivers. Boxplots also indicate a concentration of cases within the maximum and the third quartile, which is an evidence of non-normal distributions. Normality regards a symmetric distribution, which is not the case for all inspected variables. In normal Q-Q plots, dots should be along the line for a normal distribution. Hence, the analysis of the Q-Q plots leads to the same consideration of departures from normality, but in more moderate terms—some dots do stick to the line.

Next, both the Shapiro-Wilk test and the Kolmogorov-Smirnov test indicate severe departures from normality for all variables. To be considered a normal distribution, the ‘Sig.’ values should exceed ‘.05’, for a significance level of .05, which corresponds to a .05 error level, what was not the case for all variables. The null hypothesis for these tests of normality is that the data are normally distributed. The null hypothesis is rejected if the p-value is below .05. In SPSS, the p-value is labeled ‘Sig.’. Therefore, results cannot keep the null hypothesis and data cannot be considered normally distributed.

Finally, considering the sample size of 500—already discarding missing data and outliers—, the statistic value (*z*) for skewness and kurtosis were calculated and shown in Table 37, as follows. If either calculated *z* values exceed the specified critical value, then the distribution is non-normal. Assuming a significance of .01—confidence of 99%—, critical values are ±2.58, which correspond to a .01 error level. Likewise, at a significance of 0.05—confidence of 95%—, critical values are ±1.96, which correspond to a .05 error level (Hair et al., 2006).

Table 37 – Skewness and kurtosis of importance variables

Calculated statistic values (*z*) for skewness and kurtosis of importance variables								
	$z_{skewness}$	$z_{kurtosis}$		$z_{skewness}$	$z_{kurtosis}$		$z_{skewness}$	$z_{kurtosis}$
IMPT_01	-15.03	9.38	IMPT_08	-10.52	2.95	IMPT_15	-7.91	.52**
IMPT_02	-8.22	.11**	IMPT_09	-8.35	.51**	IMPT_16	-6.93	-1.10**
IMPT_03	-3.60	-1.98*	IMPT_10	-7.18	-.61**	IMPT_17	-9.14	1.36**
IMPT_04	-9.14	2.17*	IMPT_11	-6.66	-.28**	IMPT_18	-3.73	-2.64
IMPT_05	-10.11	2.77	IMPT_12	-14.62	10.77	IMPT_19	-9.90	1.88**
IMPT_06	-15.00	9.43	IMPT_13	-9.48	1.40**	IMPT_20	-7.19	.27**
IMPT_07	-7.50	1.34**	IMPT_14	-6.34	-2.10*	IMPT_21	-7.77	-.88**

Legend: * Significant at .01 significance level

** Significant at .05 significance level

$z_{skewness}$ = statistic value for skewness

$z_{kurtosis}$ = statistic value for kurtosis

A fairly similar result of the calculated *z* is derived by dividing the statistics by the appropriate standard errors of .107 (skewness) and .214 (kurtosis) (Doane, & Seward, 2011, Cramer, & Howitt, 2004, Cramer, 1998).

As a result, all variables hold a negative rightward shifted skewness, which is an evidence of significant departures from normality. Regarding the kurtosis values, positive values denote a leptokurtic—peaked— distribution, while negative values indicate a platykurtic—flatter— distribution. Although there are both positive and negative values, there is a bias for peaked distributions. Again, this is evidence of departures from normality.

Therefore because all normality tests indicate non-normal distribution of variables, non-parametric tests were deployed for comparing means among innovation drivers. Non-parametric tests are also known as distribution-free tests because it is unnecessary to hold any assumption about the probability distribution model of the population (Martins & Theóphilo, 2009).

4.1.5 Comparing means between innovation drivers

According to the methods for comparing means depicted in the methodological procedures, the non-parametric test of Wilcoxon was selected to compare means of all innovation drivers. The Wilcoxon signed ranks test is a non-parametric test suitable for comparing two related samples. The null hypothesis for these tests of means comparison is that there is no difference between the two groups. Therefore, if the null hypothesis is accepted, there is no evidence that the two samples come from different populations. Otherwise, rejecting the null hypothesis is evidence that there is difference between the two groups, hence the samples belong to different populations (Martins & Theóphilo, 2009). Cases can be considered related because the respondent for all innovation drivers is the same.

First, descriptive statistics were calculated for all 21 variables. Results are presented in Appendices 05 to 25. Calculated means for all variables are shown in Table 37, next, left columns. Then, such variables were listed from the highest to the lowest, regarding the mean of each variable. Right columns of Table 38 present the results.

Table 38 – Raking of means of importance variables

Absolute means			Ranking of means		
IMPT_01	6.531		1	IMPT_06	6.553
IMPT_02	6.060		2	IMPT_01	6.531
IMPT_03	5.250		3	IMPT_12	6.359
IMPT_04	6.046		4	IMPT_05	6.353
IMPT_05	6.353		5	IMPT_08	6.196
IMPT_06	6.553		6	IMPT_19	6.139
IMPT_07	5.730		7	IMPT_17	6.137
IMPT_08	6.196		8	IMPT_13	6.112
IMPT_09	5.798		9	IMPT_02	6.060
IMPT_10	5.990		10	IMPT_14	6.048
IMPT_11	5.689		11	IMPT_04	6.046
IMPT_12	6.359		12	IMPT_21	5.998
IMPT_13	6.112		13	IMPT_10	5.990
IMPT_14	6.048		14	IMPT_16	5.942
IMPT_15	5.606		15	IMPT_09	5.798
IMPT_16	5.942		16	IMPT_07	5.730
IMPT_17	6.137		17	IMPT_11	5.689
IMPT_18	4.712		18	IMPT_15	5.606
IMPT_19	6.139		19	IMPT_20	5.574
IMPT_20	5.574		20	IMPT_03	5.250
IMPT_21	5.998		21	IMPT_18	4.712

A paired Wilcoxon test was conducted: the highest mean compared to the second highest mean. Then, the second highest mean compared to the third highest mean, and so forth. Tables 39 and 40 present the results of the Wilcoxon test in SPSS.

Table 39 – Wilcoxon test for comparing means regarding importance variables

	impt_01 & impt_06	**impt_12 & impt_01**	impt_05 & impt_12	**impt_08 & impt_05**	impt_19 & impt_08	impt_17 & impt_19	impt_13 & impt_17	impt_02 & impt_13	impt_14 & impt_02	impt_04 & impt_14
z	-.295	**-3.759**	-.345	**-2.941**	-1.067	-.361	-.586	-.961	-.350	-.157
Asymp. Sig. (2-tailed)	.768	**.000**	.730	**.003**	.286	.718	.558	.337	.727	.876

Table 40 – Wilcoxon test for comparing means regarding importance variables (cont.)

	impt_21 & impt_04	impt_10 & impt_21	impt_16 & impt_10	impt_09 & impt_16	impt_07 & impt_09	impt_11 & impt_07	impt_15 & impt_11	impt_20 & impt_15	**impt_03 & impt_20**	**impt_18 & impt_03**
z	-1.342	-.052	-.924	-1.600	-.969	-.808	-.872	-.633	**-4.890**	**-6.051**
Asymp. Sig. (2-tailed)	.179	.959	.355	.110	.333	.419	.383	.507	**.000**	**.000**

The results of the Wilcoxon signed ranks test were based on positive ranks and show both the statistic values (z) and the asymptotic significances. With a significance of .05, z values should be outside the threshold of ±1.96 in case of statistically different means. With a significance of .01, z values should be outside the threshold of ±2.58. Likewise, the ‘Asymp. Sig.’ should be below .05 to indicate statistically different means—significance of .05.

Different means appear in four comparisons and indicate the emergence of five distinctive groups. The first group—highest importance—encompasses variables IMPT_06 (idea generation) and IMPT_01 (people). The second group—second highest importance—encompasses variables IMPT_12 (leadership) and IMPT_05 (intellectual capital). Within the third group, it is quite not possible to distinguish means between variables and this group encompasses 15 variables. The last two groups are single-variable groups and encompass, respectively, variables IMPT_03 (funding) and IMPT_18 (portfolio management).

4.1.6 Analyzing main findings

In general terms, all innovation drivers are considered important for a company to innovate because the lowest mean is 4.712—for portfolio management—within a 1 to 7 scale. Considering the neutral point to be around 4.0, the 4.712 mean is far above, and thus, it can also be understood as an important driver for a company to innovate. Moreover, on the other extreme, the idea generation driver achieved a mean as high as 6.553, which is pretty close to 7, the maximum grade, which reinforces the general idea of all innovations drivers being important for a company to innovate. Finally, the general mean for all innovation drivers reaches 5.944 within a 1-7 scale. This is convergent with literature to the extent that all innovation drivers—that were originally depicted from the literature—are considered important for a company to innovate (Hansen, & Birkinshaw, 2007, Roberts, 2007, Chesbrough, 2003, Christensen, & Overdorf, 2000, Neely, & Hii, 1998).

Nevertheless, literature is still scarce in terms of which are the most important innovation drivers among all considered drivers. To this regards, this study found that some innovation drivers are considered more important than others. Therefore such innovation drivers should be prioritized when a company decides to foster innovation. The two most important innovation drivers are: idea generation and people.

These findings might be evidence that practitioners still stick innovation to the capability of a company to be creative and consistently generate new ideas. Laursen and Salter (2006) endorse such result while highlighting the search for new ideas as a central part of the innovation process. Likewise, Hansen and Birkinshaw (2007) depict the idea generation process as the first stage for a company to enhance innovation outputs. Highly innovative companies are systematically coupled up with this feeling of ‘creativity is in the air’.

Examples include—rather not restricted to—dynamic companies that operate in fast moving industries, such as Google, Apple, Facebook, 3M, and GE, just to cite some. To this regard, the Google case, for instance, is iconic. Many relate Google's strength to an extremely ludic working place—and that workplace as something vital to inspire creativity. Therefore, many still associate the creativity and idea generation to innovation as if they were synonyms. Hence, the relation between creativity and innovativeness can be considered fairly positive and immediate. On the one hand, many reasons support creativity and idea generation as the number one innovation driver in terms of importance. On the other hand, what figures do not show are the precise reasons why it was considered so important. This could happen due to two main reasons: (1) practitioners really consider creativity and idea generation as sound drivers for a company to innovate or (2) practitioners consider that many companies are not innovative because they perform weakly in terms of creativity and idea generation—and therefore, these features deserve higher importance compared to other drivers. Although part of this discussion is settled forward in this study, further studies—especially those with qualitative in-depth approach—should be conducted to grub this gap.

The importance of people for companies to gain competitive advantages over competitors is generally well accepted. What is new in the findings of this study is that outstanding people management does not only provide a company with competitive advantage over competitors, but it also generates more innovation—although the underlying relation between innovation and competitive advantage is seemly fair. Hence, the same way creativity and idea generation are considered important for innovation, attracting, developing, and retaining extremely talented people have shown to be an important ingredient for a company to innovate. To this regard, for example, Christensen and Overdorf (2000) classify people as an intangible resource a company has to have to nurture innovation. One possible direct reason revolves around the fact that people are responsible for creativity and idea generation, which constitute an important stage for a company to innovate. Many companies that are considered outstanding in terms of innovation are those that attract the best people and this turns to be a virtuous cycle: the company attracts the best people, these best people provide the company with innovation, more innovative companies gain competitive advantage, competitive advantages provide the company with market strength, and the strong company eventually attracts the best people. Thus, working for one such innovative company is indeed a status. However, establishing alignment in terms of capability match, commitment match, and contribution match between individual and organizations purposes is vital (Boxall, 2013).

What numbers evidence is that people are considered a vital resource for a company to innovate. Therefore, a company willing to innovate should constitute an outstanding program for attracting, developing, and retaining highly talented people. And doing so, the company comes up not only with more innovation but also with many other benefits that highly talented people can provide in terms of results—a better organizational climate or projects being delivered on time, for example.

The next two important innovation drivers are: leadership and intellectual capital.

Numbers show that leadership is an important driver for a company to innovate. To this regard, leadership means having inspirational leaders in the headcount. However, this frame can be divided into two types of leaders: the first refers to the one big inspirational name and the second refers to the inspirational leader incorporated in daily activities. The first group clearly encompasses names such as Steve Jobs, Bill Gates, and Jack Welch, just to cite some, who have built an entire carrier ahead current worldwide powerful companies. And they have in common not only above-the-average leadership skills, but also a sense of leading their companies towards highly profitable initiatives, especially through innovation. In this sense, many regard leadership and innovation as synonyms. A good example is a deeper look at the Steve Jobs case: many in the market considered Apple and Steve Jobs the same innovative institution and the future of the company was put at stake by the time Steve Jobs left the company. Therefore, big inspirational leaders seem to promote a positive effect in terms of general innovative capacity of a company. The other type of leader includes those who inspire people within their daily activities. It regards direct bosses not only in high management, but those in lower hierarchical levels as well. A comprehensive content has been produced in terms of what a leader should do and how should it be done. Literature is vast and includes names as prominent as Peter Drucker and Edgar Schein. Marciariello (2006) lists some features of leaders that attain to doing the right thing and to getting the right things done: exhibit high levels of integrity in their moral and ethical conduct, attain focus on results, build on their own and other' strengths, and lead beyond borders to meet at least minimum requirements of all stakeholders, including customers, shareholders, and the public, thereby serving the common good. Although deepening into the leadership literature—and the underlying relations with innovation—sounds fascinating, it is beyond the scope of this study and therefore remains as subject for future contributions. Numbers cannot distinguish which kind of leader is that considered important for a company to innovate: the one big name or the daily leader. Nevertheless, a company willing to innovate should establish programs to root leadership capabilities in their employees.

The intellectual capital innovation driver encompasses acquiring, disseminating, and utilizing useful knowledge and is considered one of the most important innovation drivers for a company to innovate. The relations between information, knowledge, and innovation are depicted in Popadiuk and Choo (2006). The authors suggest knowledge management is good practice that leads to innovation. Knowledge management in organizations as a science has experienced a boom in terms of importance since the end of the 80’s with the studies of Takeuchi and Nonaka (1986), Nonaka (1991), and Nonaka and Takeuchi (1995). Special attention is driven to this subject because of the shift to the knowledge society era. The main contribution of the findings of this study is not telling managers to enhance knowledge management—a practice that should be promoted in any the company—but to narrow the relation of knowledge management and innovation. Not the ‘what’ but the ‘how’ seems to be the issue to be addressed in future studies.

At the other end, the two least important innovation drivers are: funding and portfolio management. Although exhibiting the lowest importance means, they are still considered important drivers for innovation in absolute terms (means above 4.0). A general reason for these two innovation drivers to be considered the least important may include wording of the affirmatives used to assess the importance of these drivers. Nevertheless, as external validation was carried out, it is not likely that this issue of wording had introduced any relevant error to the study.

Funding is necessary for a company to innovate (Christensen, & Overdorf, 2000). It refers to the capability a company has to provide access to a variety of funding channels, both inside and outside the company. Nevertheless, compared to others, it was considered one of the least important. It sounds like a big surprise because in most cases, innovation is only enabled through financial resources. One possible reason for this finding may be the emergence of highly innovative and competitive business models generated from the use of a very limited set of resources, most of them using the internet as a means to gain scale and scope (Rayport, & Sviokla, 1995). Examples include companies as diverse as: Dell, Google, Facebook, Amazon, etc. Therefore, an emerging consequence of funding being considered relatively less important is related to the industry in which the company is competing. Companies in capitalintensive industries may still require large amount of financial resources to innovate, whereas companies competing in knowledge-intensive industries may innovate using less capital.

Compared to other innovation drivers, portfolio management was considered the least important driver for a company to innovate. During data collection, one respondent regarded to portfolio management as something contributing negatively to innovation because managing several projects, products, or services at once would cause the company to lose focus. And such lack of focus would hamper an idea to become a products, service, or process in the shortest period of time. On the other hand, many innovative companies succeed in conducting several projects at once. Google is a good example, with applications as diverse as Google internet search tool, Google Maps, Google Translator, Google Drive, Gmail, just to cite some. It is notable that all those applications hold an intrinsic synergy. Maybe, what numbers try to show is the tradeoff of companies regarding quantity and quality of innovations and this study brings evidence on the preference for quality of innovation in detriment of quantity.

Therefore, even being considered less important when compared to others, funding and portfolio management should still be stimulated in companies willing to innovate.

Although all innovation drivers are considered important for a company to innovate, four should be particularly considered vital for the purposes of this quest, in this order: (1) idea generation, (2) people, (3) leadership, and (4) intellectual capital. This finding provides a company with a priority direction and opens the pathways to boost innovation. Further studies should deepen the understanding on how to put these four drivers into practice for the purposes of innovation.

Hypothesis 1—innovation drivers would be not equally important for a company to innovate—was therefore accepted.

4.2 Proposing a construct for the innovation capability

The second hypothesis of this study is described as follows. This hypothesis was tested through the use of the statistical technique of exploratory factor analysis:

Hypothesis 2 (conceptual level)

Innovation capability would derive from innovation drivers.

Hypothesis 2 (empirical level)

A construct for innovation capability would be a weighted indicator derived from the importance of each innovation driver.

4.2.1 Describing the innovation capability construct as a weighted mean of innovation drivers

According to the means of importance of each innovation driver, Hypothesis 1 of this study unveiled that innovation drivers would be not equally important for a company to innovate. As a resulting consequence, if there exists an innovation capability construct that should derive from innovation drivers, the contribution of each innovation is expected to be different—higher or lower—than that of others. For details on calculations, see item 3.4.5.1.

The resulting equation of dimension resources is:

$$resources = 0.216 * (people) + 0.200 * (technologies) + 0.174 * (funding) + 0.200 * (time) + 0.210 * (intellectual\ capital)$$

People and intellectual capital are considered the most important innovation drivers of the resources innovation dimension while, as expected, funding is considered the least important.

The resulting equation of dimension processes is:

$$processes = 0.270 * (generation) + 0.236 * (capture) + 0.255 * (conversion) + 0.239 * (diffusion)$$

Generation is considered the most important innovation driver of processes dimension while capture and diffusion are considered the least important.

The resulting equation of dimension culture is:

$$culture = 0.248 * (values) + 0.236 * (risk\ management) + 0.263 * (leadership) + 0.253 * (open\ communication)$$

Leadership innovation driver has an overall high importance and therefore is considered the most important innovation driver of the culture dimension. And risk management is considered the least important innovation driver of the culture dimension.

The resulting equation of dimension organization is:

$$organization = 0.213 * (strategy) + 0.197 * (structure) + 0.209 * (reward\ systems) + 0.216 * (workplace\ environment) + 0.166 * (portfolio\ management)$$

As already expected, portfolio management is considered the least important innovation driver of the organization dimension while workplace environment is considered the most important innovation driver.

The resulting equation of dimension external environment is:

$$external\ environment = 0.347 * (competitive\ forces) + 0.315 * (institutions) + 0.339 * (strategic\ alliances)$$

Competitive forces is considered the most important driver of the external environment dimension while institutions the least important.

The resulting equation of innovation capability, as a composite weighted mean of innovation dimensions, is:

$$innovation\ capability = 0.203 * (resources) + 0.204 * (processes) + 0.203 * (culture) + 0.191 * (organization) + 0.198 * (networking)$$

Process dimension is considered the most important innovation dimension while organization is considered the least important.

Finally, the resulting equation of innovation capability, as a composite weighted mean of innovation drivers, is:

$$\begin{aligned} & innovation\ capability \\ & = 0.052 * (people) + 0.049 * (technologies) + 0.042 * (funding) + 0.048 * (time) + 0.051 \\ & * (intellectual\ capital) + 0.052 * (generation) + 0.046 * (capture) + 0.050 * (conversion) + 0.046 \\ & * (diffusion) + 0.048 * (values) + 0.046 * (risk\ management) + 0.051 * (leadership) + 0.049 \\ & * (open\ communication) + 0.048 * (strategy) + 0.045 * (structure) + 0.048 * (reward\ system) \\ & + 0.049 * (workplace\ environment) + 0.038 * (portfolio\ management) + 0.049 \\ & * (competitive\ forces) + 0.045 * (institutions) + 0.048 * (strategic\ alliances) \end{aligned}$$

This innovation capability construct reflects the relative importance of each innovation driver and is convergent with previous findings: generation, people, leadership, and intellectual capital are considered the four most important innovation drivers while funding and portfolio management are considered the two least important innovation drivers.

4.2.2 Identifying innovation factors – exploratory factor analysis

Factor analysis is a statistical approach that can be used to analyze interrelationships among a large number of variables and to explain these variables in terms of their common underlying factors. These factors—that are by definition highly intercorrelated—are assumed to represent dimensions within the data (Hair Jr. et al., 2006).

Regarding the sample size question, Hair Jr. et al. (2006, p. 112) suggest: “the minimum is to have at least five times as many observations as the number of variables to be analyzed, and the more acceptable sample size would have a 10:1 ratio.” In this study, a number of 500+ sample size is adequate and the exploratory factor analysis may be conducted considering the 21 variables of innovation driver importance.

4.2.2.1 Analyzing the correlation matrix

Appendix 03 shows the correlation matrix of all 21 innovation driver importance variables. The deployed method for the calculations of the correlation coefficients was that proposed by

Pearson (Coopers, & Schindler, 2008). The test of significance was 2-tailed, and both 5% and 1% of confidence were considered.

The paired correlations are low, which indicates an uncorrelated set of data. It is generally not suggested to perform a factor analysis when the data are uncorrelated because it is expected that the data matrix has sufficient correlations to justify the application of factor analysis. To this end, one available method of determining the appropriateness of factor analysis examines the entire correlation matrix. It is named the Bartlett's test of sphericity, a statistical test for the presence of correlations among the variables (Hair Jr. et al., 2006).

4.2.2.2 Performing the principal components analysis

In all next results, the Bartlett's test of sphericity was statistically significant ('Sig.' < .05). It indicates that sufficient correlations exist among the variables to proceed.

The Kaiser-Meyer-Olkin—KMO—indicator measures the sampling adequacy and is used to compare the magnitudes of the observed correlation coefficients in relation to the magnitude of the partial correlation coefficients. Large KMO values are desirable because correlations between variables can be explained by the other variables. In all next results, the KMO indicator was above .85, which is adequate to perform a principal components analysis—actually, values above .50 are considered adequate (Hair Jr. et al., 2006).

Hair Jr. et al. (2006) posit that the most commonly applied technique for defining the number of factors to extract is the latent root—also named eigenvalues—criterion. According to this criterion, any individual factor should account for the variance of at least a single variable if it is to be retained for interpretation. Each variable contributes a value of 1 to the total eigenvalue. Hence, only the factors having eigenvalues greater than 1 are considered significant. To run the principal components analysis, the criterion of 'eigenvalues greater than 1' was set.

Hair Jr. et al. (2006) consider the factor rotation as the most important tool to interpret factors. The reference axes of the factors are turned about the origin until some other position has been reached. Cases of rotation include both orthogonal and oblique. In the former, the axes are maintained at 90 degrees and in the latter, such constraint does no longer attain. The same general principles of orthogonal rotations pertain to oblique rotations, which is more flexible and realistic because the theoretically important underlying dimensions are not assumed to be uncorrelated with each other. Oblique solutions provide information about the extent to which the factors are actually correlated to each other. The ultimate goal of any rotation is to obtain some theoretically meaningful factors and, if possible, the simplest factor structure. The SPSS provides the OBLIMIN oblique rotation method and this technique was deployed for the purposes of this study.

The factor loading matrix contains the factor loading of each variable on each factor. In the case of oblique rotation, two matrices of factor loadings are provided: the factor pattern matrix and the factor structure matrix. The former has loadings that represent the unique contribution of each variable to the factor. The latter has simple correlations between variables and factors and the correlation between factors. As the correlation among factors becomes greater, it becomes more difficult to distinguish which variables load uniquely on each factor in the factor structure matrix (Hair Jr. et al., 2006). Therefore, results are presented in terms of the factor pattern matrix.

According to previous procedures, the resulting pattern matrix is shown in Figure 24, as follows.

Pattern Matrix[a]

	Component				
	1	2	3	4	5
impt_01	-,154	-,098	,240	,003	,662
impt_02	,088	,051	-,008	,053	,627
impt_03	,192	-,021	-,134	,060	,665
impt_04	-,102	,119	,407	,103	,274
impt_05	,071	,092	,667	,115	,146
impt_06	,226	,119	,707	,052	-,060
impt_07	,564	,055	,221	-,115	,181
impt_08	,681	,016	,351	-,050	-,059
impt_09	,549	,203	-,241	,056	,071
impt_10	,463	,006	,019	,321	,135
impt_11	,374	-,157	-,015	,517	,083
impt_12	-,083	,062	,085	,771	,041
impt_13	-,059	,050	,048	,782	-,027
impt_14	,471	,059	-,030	,385	-,060
impt_15	,367	,181	-,039	,084	,155
impt_16	,120	,296	,012	,000	,364
impt_17	-,239	,462	,048	,294	,127
impt_18	,130	,450	-,287	-,007	,309
impt_19	,073	,731	,126	,029	-,173
impt_20	,058	,685	,028	-,054	,067
impt_21	-,012	,770	,062	,022	-,048

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 20 iterations.

Figure 24 – Pattern matrix of principal component analysis

Next step includes identifying the significant loadings for each variable. To this end, the interpretation starts with the first variable on the first factor and moving horizontally from left to right, looking for the highest loading for that variable on any factor. When the highest loading—largest absolute factor loading—is identified, it should be underlined if significant. After analyzing the first variable, attention then focuses on the second variable. This procedure should continue for each variable until all variables have been reviewed for their highest loading on a factor.

Although factor loadings of ±.30 and ±.40 are minimally acceptable, values greater than ±.50 are generally considered necessary for practical significance. To be considered significant, a smaller loading is needed given either a large sample size or a large number of variables being analyzed (Hair Jr. et al., 2006). For the purposes of this study, a threshold of ±.40 was established considering a sample size of 500+ and 21 variables. A step by step approach was adopted while excluding variables considered not significant loading.

Details on the resulting statistics for factor analysis are provided in Appendix 26. In this case, variable IMPT_16 was identified to be excluded and the whole procedure was repeated. The resulting pattern matrix is shown in Figure 25, as follows.

Pattern Matrix[a]

	Component				
	1	2	3	4	5
impt_01	-,120	,238	,070	-,001	,643
impt_02	,088	-,010	-,080	-,016	,675
impt_03	,178	-,126	-,005	-,094	,639
impt_04	-,078	,433	-,123	-,093	,261
impt_05	,102	,676	-,092	-,084	,150
impt_06	,239	,694	-,109	-,070	-,087
impt_07	,582	,199	-,050	,117	,158
impt_08	,702	,296	-,014	,115	-,005
impt_09	,550	-,260	-,209	-,003	,125
impt_10	,490	,025	,005	-,334	,097
impt_11	,337	-,038	,130	-,456	,178
impt_12	-,066	,105	-,060	-,731	,080
impt_13	-,059	,060	-,045	-,786	-,025
impt_14	,488	-,030	-,044	-,427	-,115
impt_15	,395	-,029	-,156	-,190	,006
impt_17	-,217	,063	-,455	-,309	,107
impt_18	,129	-,293	-,469	,033	,345
impt_19	,062	,117	-,737	-,017	-,152
impt_20	,060	,021	-,691	,045	,064
impt_21	,000	,057	-,768	,008	-,019

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 29 iterations.

Figure 25 – Pattern matrix of principal component analysis without IMPT_16

Details on the resulting statistics for factor analysis without variable IMPT_16 are provided in Appendix 27. According to procedures described previously, variable IMPT_15 was identified to be excluded and the process was repeated. The resulting pattern matrix is shown in Figure 26, as follows.

Pattern Matrix[a]

	Component				
	1	2	3	4	5
impt_01	-,037	,258	,080	-,069	,634
impt_02	,033	-,017	-,083	,080	,673
impt_03	,129	-,117	-,007	,112	,655
impt_04	,071	,450	-,115	-,071	,258
impt_05	,077	,679	-,092	,134	,149
impt_06	,085	,672	-,113	,295	-,097
impt_07	-,040	,152	-,069	,593	,164
impt_08	-,018	,246	-,042	,713	-,005
impt_09	,098	-,288	-,230	,499	,115
impt_10	,432	,000	-,017	,423	,084
impt_11	,521	-,072	,115	,282	,159
impt_12	,721	,116	-,065	-,136	,068
impt_13	,789	,082	-,041	-,181	-,022
impt_14	,518	-,055	-,063	,390	-,106
impt_17	,270	,090	-,447	-,268	,116
impt_18	-,020	-,304	-,474	,101	,351
impt_19	,021	,107	-,750	,049	-,160
impt_20	-,028	,013	-,696	,059	,056
impt_21	-,028	,047	-,769	,010	-,012

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 17 iterations.

Figure 26 – Pattern matrix of principal component analysis without IMPT_15

Details on the resulting statistics for factor analysis without variable IMPT_15 are provided in Appendix 28.

The process of interpretation would be greatly simplified if each variable had only one significant loading. Nevertheless, it is possible to find that one or more variables each have moderate-size loadings on several factors, all of which are significant, and interpreting the factors is become much more difficult. Cross-loading refers to the situation when a variable is found to have more than one significant loading. If a variable persists in having cross-loading, it becomes a candidate for deletion (Hair Jr., et al. 2006). This is what happens with variable IMPT_10 and therefore it was excluded. After removing variable IMPT_10, the process was repeated. The resulting pattern matrix is shown in Figure 27, next.

Pattern Matrix[a]					
	Component				
	1	2	3	4	5
impt_01	,004	,285	,114	,050	,597
impt_02	,049	,010	-,080	-,055	,656
impt_03	,065	-,096	-,028	-,085	,687
impt_04	,066	,465	-,141	,094	,264
impt_05	,052	,671	-,099	-,159	,160
impt_06	,121	,642	-,099	-,320	-,102
impt_07	-,029	,141	-,041	-,624	,162
impt_08	-,013	,224	-,056	-,742	-,046
impt_09	,103	-,306	-,193	-,525	,132
impt_11	,523	-,111	,175	-,346	,183
impt_12	,741	,103	-,069	,098	,040
impt_13	,826	,053	,004	,099	-,018
impt_14	,453	-,054	-,086	-,359	-,058
impt_17	,324	,099	-,439	,250	,091
impt_18	-,007	-,308	-,408	-,106	,407
impt_19	,073	,101	-,724	-,061	-,147
impt_20	-,054	,003	-,685	-,061	,096
impt_21	-,036	,037	-,776	-,029	-,006

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 13 iterations.

Figure 27 – Pattern matrix of principal component analysis without IMPT_10

Details on the resulting statistics for factor analysis without variable IMPT_10 are provided in Appendix 29. In the resulting pattern matrix, the same issue of cross-loading was identified for variable IMPT_18. Thus, variable IMPT_18 was excluded and the process repeated. The resulting pattern matrix is shown in Figure 28, as follows.

Pattern Matrix[a]					
	Component				
	1	2	3	4	5
impt_01	,001	-,071	,122	,303	,566
impt_02	,025	,079	-,128	-,042	,702
impt_03	,058	,121	-,073	-,130	,711
impt_04	,072	-,134	-,123	,485	,203
impt_05	,050	,081	-,052	,741	,078
impt_06	,100	,241	-,060	,705	-,151
impt_07	-,058	,606	-,046	,176	,177
impt_08	-,048	,710	-,055	,268	-,031
impt_09	,120	,582	-,176	-,218	,100
impt_11	,529	,375	,175	-,045	,151
impt_12	,712	-,089	-,091	,087	,068
impt_13	,820	-,081	,005	,082	-,035
impt_14	,425	,379	-,095	-,026	-,030
impt_17	,313	-,231	-,443	,078	,101
impt_19	,065	,060	-,710	,102	-,134
impt_20	-,074	,079	-,704	-,033	,142
impt_21	-,050	,048	-,778	,018	,023

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 12 iterations.

Figure 28 – Pattern matrix of principal component analysis without IMPT_18

Details on the resulting statistics for factor analysis without variable IMPT_18 are provided in Appendix 30.

Hair Jr. et al. (2006) suggest that once all significant loadings have been identified, it is necessary to look for any variables that are not adequately accounted for by the factor solution. One simple approach is to identify any variables lacking at least one significant loading. This is not what happens in the resulting pattern matrix. Another approach is to examine each variable's communality, which represents the amount of variance accounted for by the factor solution for each variable. Analyzing the communalities is useful to assess whether the variables meet acceptable levels of explanation. Variables with communalities less than .50 may be considered as not having sufficient explanation.

When an acceptable factor solution has been reached in which all variables have a significant loading, it is timely to assign some meaning to the pattern of factor loadings. Variables with higher loadings are considered more important and have greater influence on the label selected to represent a factor. These labels were intuitively developed based on the appropriateness for representing the underlying dimensions of a particular factor (Hair Jr. et al., 2006).

Figure 29, next, encompasses a joint view of the conceptual model, the resulting pattern matrix, communalities, and the final label factors.

			Pattern Matrix[a]						
Original Factors	Innovation Drivers		Component					Communalities	Final Factors
			1	2	3	4	5		
Resources	*People*	*impt_01*	*,001*	*-,071*	*,122*	*,303*	*,566*	*,440*	Tangible Resources
	Technologies	**impt_02**	**,025**	**,079**	**-,128**	**-,042**	**,702**	**,582**	
	Funding	**impt_03**	**,058**	**,121**	**-,073**	**-,130**	**,711**	**,586**	
	Time	*impt_04*	*,072*	*-,134*	*-,123*	*,485*	*,203*	*,393*	Intangible Resources
	Intellectual Capital	**impt_05**	**,050**	**,081**	**-,052**	**,741**	**,078**	**,645**	
Processes	**Generation**	**impt_06**	**,100**	**,241**	**-,060**	**,705**	**-,151**	**,617**	
	Capture	*impt_07*	*-,058*	*,606*	*-,046*	*,176*	*,177*	*,495*	Processes
	Conversion	**impt_08**	**-,048**	**,710**	**-,055**	**,268**	**-,031**	**,602**	
	Diffusion	**impt_09**	**,120**	**,582**	**-,176**	**-,218**	**,100**	**,501**	
Culture	**Risk Management**	**impt_11**	**,529**	**,375**	**,175**	**-,045**	**,151**	**,518**	Culture
	Leadership	**impt_12**	**,712**	**-,089**	**-,091**	**,087**	**,068**	**,604**	
	Open Communication	**impt_13**	**,820**	**-,081**	**,005**	**,082**	**-,035**	**,667**	
Organization	*Strategy*	*impt_14*	*,425*	*,379*	*-,095*	*-,026*	*-,030*	*,422*	
	Workplace Environment	*impt_17*	*,313*	*-,231*	*-,443*	*,078*	*,101*	*,435*	Networking
External Environment	**Competitive Forces**	**impt_19**	**,065**	**,060**	**-,710**	**,102**	**-,134**	**,561**	
	Institutions	**impt_20**	**-,074**	**,079**	**-,704**	**-,033**	**,142**	**,552**	
	Strategic Alliances	**impt_21**	**-,050**	**,048**	**-,778**	**,018**	**,023**	**,615**	

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Figure 29 – Final pattern matrix of principal component analysis

The final five proposed factors include: (1) tangible resources, (2) intangible resources, (3) processes, (4) culture, and (5) networking. The proposed final factors inherit several common aspects from the conceptual model.

The original resources factor was broke down into two sorts of resources: tangible and intangible, each representing the intrinsic nature of that resource. Tangible resources encompass people, technologies, and funding. The resource people seems to be the driver that less explains this factor, because of its lower communality. Although a company can hire an outstanding employee, the people resource seems to remain somewhat in intangible resources. Intangible resources include time, intellectual capital, and idea generation. The resource time seems to be the driver that less explains this factor, again, because of its lower communality. Although the resource time is clearly an intangible resource, it holds less influence on that factor when compared to intellectual capital and idea generation. Reasons may include: (1) lack of understanding of time as an asset for a company to innovate or (2) albeit its intangible nature, time may be classified as something quite different when compared to intellectual capital and idea generation.

The original processes factor remains quite unchanged in the proposed final version of factors. Although idea generation holds a clear role as a process, it was closely related to intellectual capital. It may have occurred due to proximity of both questions in the questionnaire and such proximity could have led respondents to understand both questions as similar. Another reason is that intellectual capital may have been understood as a pre-condition for creativity and idea generation to take place.

The original culture factor remains in the proposed final version except for the: (1) exclusion of driver values and (2) inclusion of driver strategy. The exclusion of driver values sounds quite unusual because the organizational culture should reflect the values of such company. One possible reason for this exclusion may be the fact that other drivers pertaining to this factor—risk management, leadership, and open communication—already reflect the values of a company. Regarding the inclusion of driver strategy, even with a low communality, the driver was identified as pertaining to the culture factor. This is not somewhat difficult to explain because culture and strategy are two interrelated concepts in business: culture should reflect the guidelines provided by strategy.

Original factor organization was excluded from the proposed final version of factors. Both because drivers—structure, reward systems, portfolio management—were excluded during the exploratory factor analysis process and then remaining drivers—strategy and workplace environment—were rearranged into other factors.

Finally, the original factor external environment was relabeled as networking due to the inclusion of driver workplace environment, which previously belonged to the no longer existing organization factor. Nevertheless, driver workplace environment holds the lower communality and therefore, it is the one to explain less the resulting networking factor. The drivers competitive forces, institutions, and strategic alliances were foreseen as pertaining to the external environment dimension and they altogether still hold the same rationale for the resulting networking factor.

4.2.3 Describing the innovation capability construct as a weighted mean of innovation factors

According to the means of importance of each innovation driver, Hypothesis 1 of this study unveiled that innovation drivers would be not equally important for a company to innovate. Same findings are depicted after the exploratory factor analysis took place. However, formerly, the mean of importance of each driver was used to calculate the relative importance of that driver in relation to others. Now, the factor loadings are employed for the same purpose. For details on calculations, see item 3.4.5.2.

The resulting equation of factor tangible resources is:

$$tangible\,resources = 0.286 \times (people) + 0.355 \times (technologies) + 0.359 \times (funding)$$

Contrary to previous results, innovation driver funding is considered the most important of tangible resources factor while people is considered the least important of this factor.

The resulting equation of factor intangible resources is:

$$intangible\,resources = 0.251 \times (time) + 0.384 \times (intellectual\,capital) + 0.365 \times (generation)$$

In terms of intangible resources, innovation driver time is considered the least important of this factor and intellectual capital the most important innovation driver of factor intangible resources.

The resulting equation of factor processes is:

$$processes = 0.319 \times (capture) + 0.374 \times (conversion) + 0.307 \times (diffusion)$$

Conversion innovation driver is considered the most important innovation driver of factor processes while capture is considered the least important innovation driver of this factor.

The resulting equation of factor culture is:

$$culture = 0.213 \times (risk\ management) + 0.286 \times (leadership) + 0.330 \times (open\ communication) + 0.171 \times (strategy)$$

Strategy is considered the least important innovation driver that composes the culture factor while open communication is considered the most important innovation driver of culture factor.

The resulting equation of factor networking is:

$$networking = 0.168 \times (workplace\ environment) + 0.269 \times (competitive\ forces) + 0.267 \times (institutions) + 0.295 \times (strategic\ alliances)$$

Strategic alliances is considered the most important innovation driver of networking factor while workplace environment the least important of this factor.

The resulting equation of innovation capability, as a composite weighted mean of innovation factors, is:

$$innovation\ capability = 0.113 \times (tangible\ resources) + 0.124 \times (intangible\ resources) + 0.142 \times (processes) + 0.489 \times (culture) + 0.133 \times (networking)$$

Culture factor is the one that holds the highest contributions for innovation capability and the tangible resources is the one with lowest contributions for innovation capability.

Finally, the resulting equation of innovation capability, as a composite weighted mean of innovation drivers, is:

$$innovation\ capability = 0.032 * (people) + 0.040 * (technologies) + 0.041 * (funding) + 0.031 * (time) + 0.047 * (intellectual\ capital) + 0.045 * (generation) + 0.045 * (capture) + 0.053 * (conversion) + 0.043 * (diffusion) + 0.104 * (risk\ management) + 0.140 * (leadership) + 0.161 * (open\ communication) + 0.084 * (strategy) + 0.022 * (workplace\ environment) + 0.036 * (competitive\ forces) + 0.035 * (institutions) + 0.039 * (strategic\ alliances)$$

This innovation capability construct reflects the relative importance of each innovation driver: open communication, leadership, and risk management are considered the three most important innovation drivers while workspace environment is considered the least important innovation driver.

4.2.4 Analyzing main findings

The goal of proposing a construct for innovation capability was unfolded into two different yet complimentary approaches. The first model employed simple calculations of weights regarding the relative strength—in terms of mean of importance—of each innovation driver. The second model used the exploratory factor analysis, extraction method of principal component analysis, to depict the relative strengths—in terms of factor loadings—of each innovation driver.

Table 41, next, exhibits a comparison between the two methods, including dimensions (model 1), factors (model 2), innovation drivers, and the coefficients of each innovation driver. For each model, the sum of coefficients totals 100%, as predicted in the proposal for the construct of innovation capability. For details, see items 3.4.5.1 and 3.4.5.2.

Table 41 – Comparing models of the construct of innovation capability

Innovation capability – Model 1			Innovation capability – Model 2		
Resources	People	.052	**Tangible Resources**	People	.032
	Technologies	.049		Technologies	.040
	Funding	.042		Funding	.041
	Time	.048	**Intangible Resources**	Time	.031
	Intellectual Capital	.051		Intellectual Capital	.047
Processes	Generation	.052		Generation	.045
	Capture	.046	**Processes**	Capture	.045
	Conversion	.050		Conversion	.053
	Diffusion	.046		Diffusion	.043
Culture	Values	.048	**Culture**		
	Risk Management	.046		Risk Management	.104
	Leadership	.051		Leadership	.140
	Open Communication	.049		Open Communication	.161
Organization	Strategy	.048		Strategy	.084
	Structure	.045			
	Reward System	.048			
	Workplace Environment	.049	**Networking**	Workplace Environment	.022
	Portfolio Management	.038			
External Environment	Competitive Forces	.049		Competitive Forces	.036
	Institutions	.045		Institutions	.035
	Strategic Alliances	.048		Strategic Alliances	.039

First main finding is that both models seem to interestingly represent the construct of innovation capability and both have solid foundations in case future studies are to employ any of them. The coefficients of the first model are more homogeneous and strongly represent the weights of the importance of each innovation driver in relation to the global context. The coefficients of the second model are more scattered and a strong weight on culture inserts this unbalance to the model. Albeit culture’s irrefutable importance for a company to innovate, it is unlikely that the innovation drivers of this factor be 4-5 times more important than others.

Second main finding regards the absence of some innovation drivers in the second model: values, structure, reward system, and portfolio management. In other words, it means these four innovation drivers do not contribute to innovation at all (coefficients equal zero), which is markedly distinct from literature (Christensen, & Overdorf, 2000, Neely, & Hii, 1998).

Further studies may address the controversial contribution of these four innovation drivers towards innovation.

Finally, third main finding is related to the procedures adopted to propose a construct for innovation capability. Two different techniques were employed to provide answers to the same specific goal. Nevertheless, even though both techniques hold a defensible procedure, results were quite different. To this regard, future studies should address the contributions of each specific innovation driver towards the innovation outputs.

For the purposes of this study, the second model is adopted to represent the construct for innovation capability because of its validation through data from a field research—even though the correlation matrix showed low correlations among variables and some innovation drivers showed not to be significant and were therefore excluded from the final model. In this sense, the first model is conceptually well founded as it comes from the literature—in the form of the conceptual model of this study. Nevertheless, innovation dimensions and innovation drivers of the first model are subject to the researcher's interpretation of the literature, with no validation in terms of a previous research.

As a final remark, hypothesis 2—innovation capability would derive from innovation drivers—was therefore accepted.

4.3 Identifying the most practiced innovation drivers

The third hypothesis of this study is described as follows. This hypothesis was tested through the use of the statistical technique of mean comparison:

Hypothesis 3 (conceptual level)

Innovation drivers would be not equally practiced in companies.

Hypothesis 3 (empirical level)

Compared to others, one or more innovation drivers would show higher means of practice in companies.

4.3.1 Describing collected data

Starting with a total of 528 filled questionnaires, two techniques were deployed to have one valid response per company: (1) reducing the number of respondents to only one per company to have a figure about the company and not the respondent and (2) eliminating badly formed responses. For the purposes of this part of the study—and hereafter in this document—, the unit is a company operating in Brazil, although information comes from respondents, who are representative of executives of companies operating in Brazil.

Considering that more than one respondent per company was allowed for the two first parts of this study, the amount of 528 encompassed those cases of companies with more than one respondent. It was possible to identify those cases comparing the names of companies, even when misspellings were noticed. Regarding those identified cases, it was decided that only one response would be considered and therefore, other responses for the same company were discarded. Two main reasons were considered to this end: (1) theoretically, responses about practice should be the same regardless the respondent and (2) conducting the calculations of means would lead to comparing non-integer values with integer values, which seems to be a non-justifiable procedure. Criteria to depict which response was elected to represent a company followed this: (1) variable position in the company (the higher the position, the stronger that response. The rationale is that higher position in the company demands a more holistic view of the business, thus these practitioners can provide a more precise response), (2) variable highest academic degree (the higher the academic degree, the stronger that response. The rationale is that executives with higher academic degree have not only strong daily practices but also strong knowledge background, thus they can provide a more precise response), (3) variable age (the older the respondent, the stronger that response. The rationale is that older practitioners are more experienced, thus they can provide a more precise response), and (4) variable department (respondents pertaining to the 'Strategy and Business Development' department were considered more adequate to the purposes of this study than others. They were followed by those respondents pertaining to the 'R&D' department). Following these criteria, it resulted in only one response per company.

After reducing the number of responses per company to one, the attempt was to identify and eliminate badly formed responses. A badly formed response includes: (1) excessive number of missing data per respondent and (2) inadequate responses within the 1-7 scale. The threshold of maximum 2 missing data per respondent was adopted. Albeit the sharp decline of valid responses, this criterion was considered correct because it has contributed to the reliability of remaining data. Moreover, the sample size was large enough to allow this procedure to be conducted. The reasons for the emergence of such large number of missing data may result from respondents' unwillingness to respond to the questionnaire, but more often were the cases where the respondent did not have enough information about the practices within their company. One respondent even made this comment: "I am new to the company and therefore I have no sufficient information and knowledge to respond to these questions." Future researches should address this issue of the respondent not having information about the company where he works and therefore be considered eligible to provide answers about the company. In the case of inadequate responses within the 1-7 scale, responses with values other than some integer from 1 to 7 were discarded. The main reason for this procedural error is badly conducted tabulation. Although errors while tabulating data are undesirable, their occurrences are quite understandable in the case of a sample size of more than 500 and the whole field research was paper-based. No uneasiness is required because the number of such events was no more than 10.

Applying both procedures of considering only one response per company and of eliminating badly formed responses, a total of 386 responses were considered valid.

Reliability statistics on the 21 importance variables include: (1) Cronbach's alpha of virtually 1.000 and (2) Cronbach's alpha based on standardized items of virtually 1.000. Therefore data can be considered reliable and statistical tests can be performed.

Figure 30, as follows, shows the sample distribution regarding age of respondents.

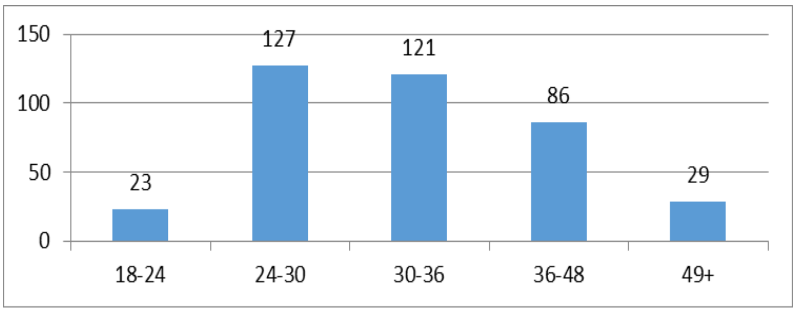

Figure 30 – Frequency of age of respondents

Respondents are relatively young in terms of age, which reflects the profile of graduate programs being held in Brazil. Only about 30% of respondents are 36 or older. Table 42, next, shows the precise frequencies. No missing data were observed.

Table 42 – Frequency of age of respondents, with and without missing data

Age	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
18-24	23	5.96%	5.96%
24-30	127	32.90%	32.90%
30-36	121	31.35%	31.35%
36-48	86	22.28%	22.28%
49+	29	7.51%	7.51%
Missing	0	0.00%	
Total	386	100.00%	100.00%

Figure 31, next, presents the distribution of the sample regarding gender of respondents.

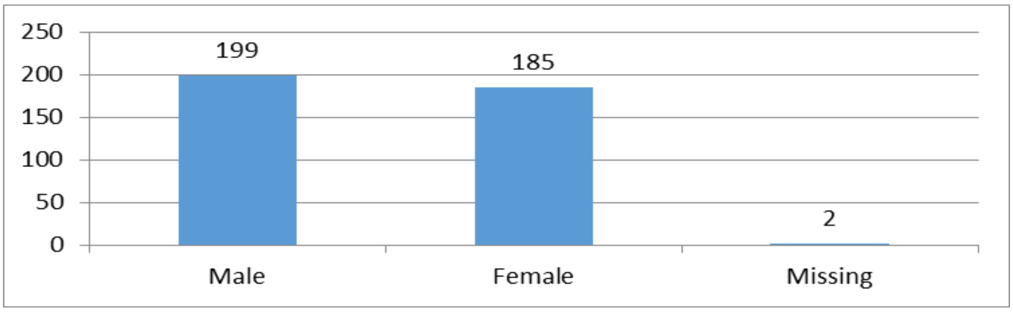

Figure 31 – Frequency of gender of respondents

Males and females hold a fairly equal distribution with respectively 51.55% and 48.18%. Table 43, next, shows the precise frequencies, both with and without missing data.

Table 43 – Frequency of gender of respondents, with and without missing data

Gender	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Male	199	51.55%	51.82%
Female	185	47.93%	48.18%
Missing	2	0.52%	
Total	386	100.00%	100.00%

Figure 32, next, presents the distribution of the sample regarding *highest academic degree* of respondents.

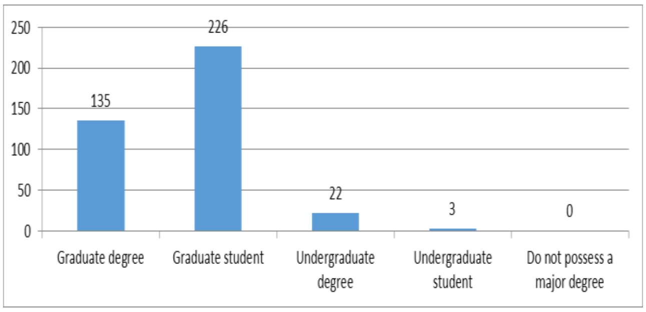

Figure 32 – Frequency of highest academic degree of respondents

A majority of 93.52% of respondents is either graduate students or they already possess a graduate degree. Table 44, next, shows the precise frequencies. No missing data were observed.

Table 44 – Frequency of highest academic degree of respondents, with and without missing data

Highest academic degree	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Graduate degree	135	34.97%	34.97%
Graduate student	226	58.55%	58.55%
Undergraduate degree	22	5.70%	5.70%
Undergraduate student	3	0.78%	0.78%
Do not possess a major degree	0	0.00%	0.00%
Missing	0	0.00%	
Total	386	100.00%	100.00%

Figure 33, next, presents the distribution of the sample regarding current position in the company of respondents.

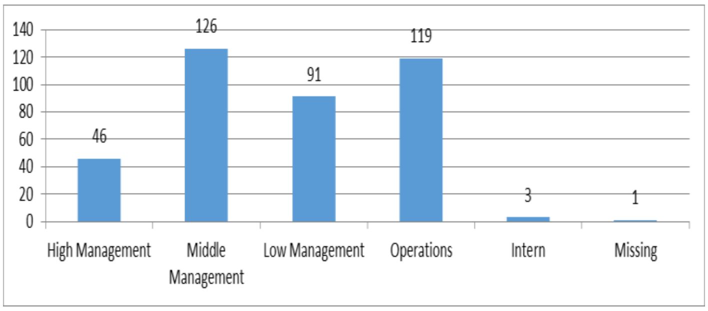

Figure 33 – Frequency of position in the company of respondents

Almost 45% of respondents holds a title of middle management or higher. Nevertheless, the majority of respondents occupy positions no greater than middle management. Table 45, next, shows the precise frequencies, both with and without missing data. Again, this distribution may reflect the profile of students in the Brazilian higher education.

Table 45 – Frequency of position in the company of respondents, with and without missing data

Position in the company	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
High Management	46	11.92%	11.95%
Middle Management	126	32.64%	32.73%
Low Management	91	23.58%	23.64%
Operations	119	30.83%	30.91%
Intern	3	0.78%	0.78%
Missing	1	0.26%	
Total	386	100.00%	100.00%

Figure 34, next, shows the distribution of the sample regarding current department to which the respondent belongs to.

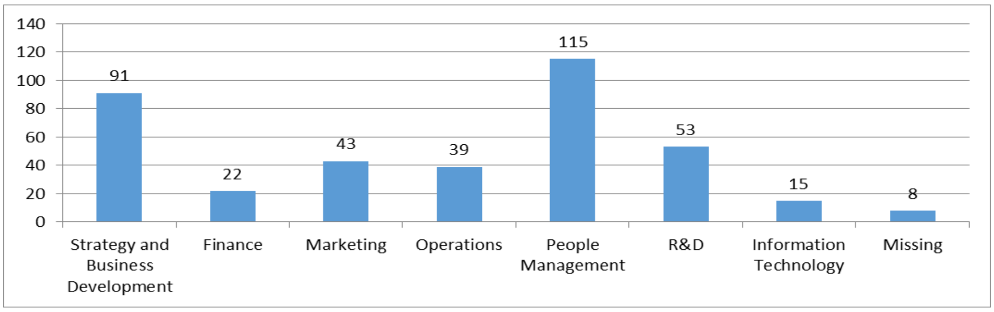

Figure 34 – Frequency of department of respondents

More than half of the sample belongs to (1) Strategy and Business Development or (2) People Management. A 13.73% of respondents belonging to the R&D department is of interest for the purposes of this study. Table 46, next, shows the precise frequencies, both with and without missing data.

Table 46 – Frequency of department of respondents, with and without missing data

Department	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Strategy and Business Development	91	23.58%	24.07%
Finance	22	5.70%	5.82%
Marketing	43	11.14%	11.38%
Operations	39	10.10%	10.32%
People Management	115	29.79%	30.42%
R&D	53	13.73%	14.02%
Information Technology	15	3.89%	3.97%
Missing	8	2.07%	
Total	386	100.00%	100.00%

Figure 35, next, shows the distribution of the sample regarding current number of employees of represented companies.

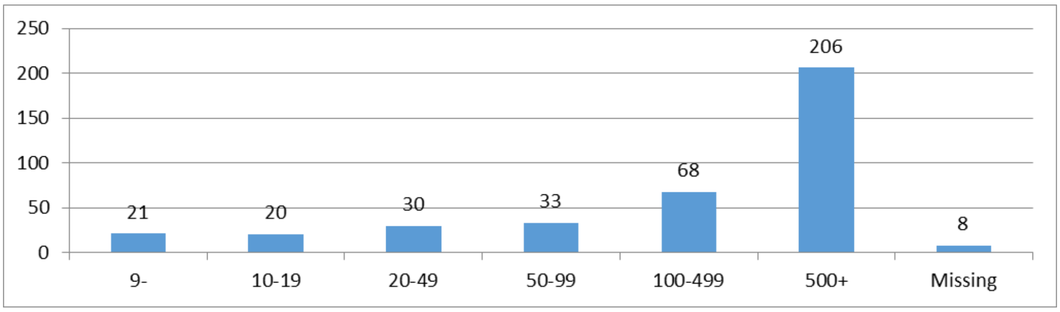

Figure 35 – Frequency of number of employees of companies

The sample comprises about 71% of companies employing 100 or more people, of which about 53% of companies employ 500 or more people. These figures are quite interesting for the purposes of this study, as the majority of companies are considered big companies. Table 47, next, shows the precise frequencies, both with and without missing data.

Table 47 – Frequency of number of employees of companies, with and without missing data

number of employees	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
9-	21	5.44%	5.56%
10-19	20	5.18%	5.29%
20-49	30	7.77%	7.94%
50-99	33	8.55%	8.73%
100-499	68	17.62%	17.99%
500+	206	53.37%	54.50%
Missing	8	2.07%	
Total	386	100.00%	100.00%

Figure 36, next, shows the distribution of the sample regarding main industry of represented companies.

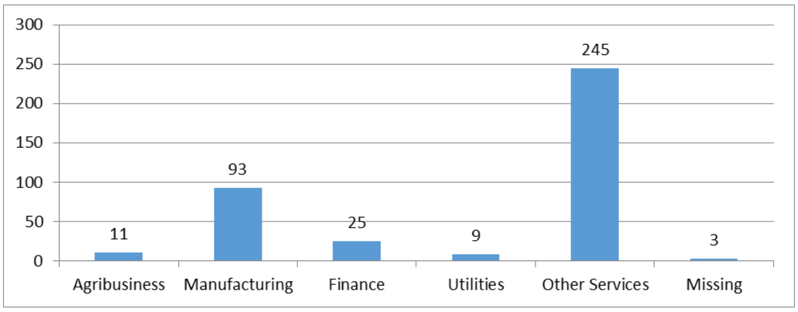

Figure 36 – Frequency of industry of companies

The majority of the sample—with about 63% of represented companies—belongs to the services industry. Another 24% of companies compete within the manufacturing industry, and no more than 12% of companies belong to agribusiness, finance, and utilities. Table 48, next, shows the precise frequencies, both with and without missing data.

Table 48 – Frequency of industry of companies, with and without missing data

industry	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Agribusiness	11	2.85%	2.87%
Manufacturing	93	24.09%	24.28%
Finance	25	6.48%	6.53%
Utilities	9	2.33%	2.35%
Other Services	245	63.47%	63.97%
Missing	3	0.78%	
Total	386	100.00%	100.00%

Figure 37 shows the distribution of the sample regarding maturity of represented companies.

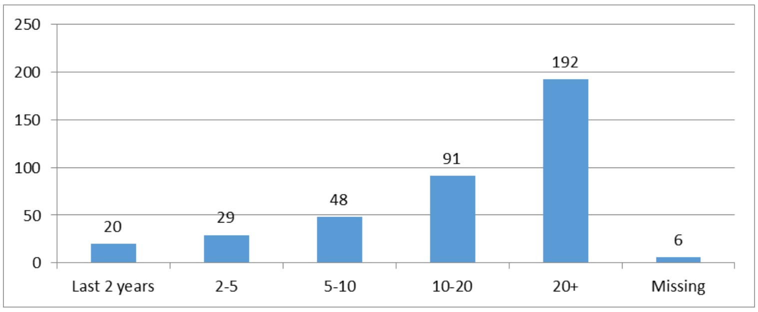

Figure 37 – Frequency of maturity of companies

More than 73% of represented companies operate for 10 years or more, of which almost 50% of companies operate for more than 20 years. This is evidence that sampled companies are quite mature, in terms of longevity, and therefore, adequate for the purposes of this study. Table 49, next, presents the precise frequencies, both with and without missing data.

Table 49 – Frequency of maturity of companies, with and without missing data

maturity	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Last 2 years	20	5.18%	5.26%
2-5	29	7.51%	7.63%
5-10	48	12.44%	12.63%
10-20	91	23.58%	23.95%
20+	192	49.74%	50.53%
Missing	6	1.55%	
Total	386	100.00%	100.00%

Figure 38, next, shows the distribution of the sample regarding country of origin of represented companies.

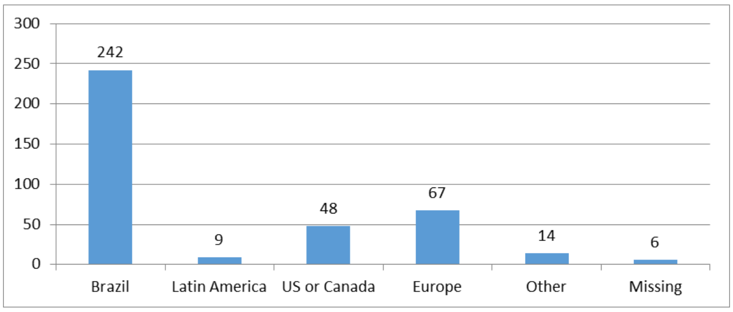

Figure 38 – Frequency of country of origin of companies

Table 50, next, presents the precise frequencies, both with and without missing data.

Table 50 – Frequency of country of origin of companies, with and without missing data

country of origin	Absolute Frequency	Relative Frequency	Relative Frequency w/out Missing
Brazil	242	62.69%	63.68%
Latin America	9	2.33%	2.37%
US or Canada	48	12.44%	12.63%
Europe	67	17.36%	17.63%
Other	14	3.63%	3.68%
Missing	6	1.55%	
Total	386	100.00%	100.00%

Brazilian companies represent more than 62% of the sample and companies from US, Canada, or Europe account for almost 30%. In short, vast majority of the sample comprises companies from Brazil, US, Canada, and Europe.

Figure 39, next, shows the distribution of the sample regarding yearly income of represented companies.

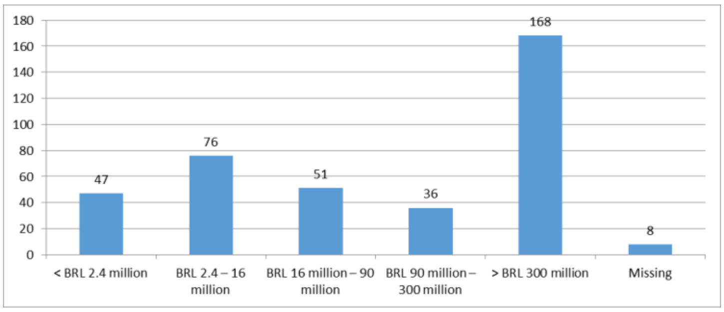

Figure 39 – Frequency of yearly income of companies

Although more than 43% of represented companies are considered big companies, the yearly income variable proved to be poorly measured. Many respondents alleged not to know the yearly income of their respective companies because the information is not public and they did not have access to it. In some cases, respondents claimed that they had no idea about this information, even when the company was public—which means operating in the stock exchange. Therefore, the yearly income variable may not be considerable reliable for the purposes of this study. Table 51 presents the precise frequencies, both with and without missing data.

Table 51 – Frequency of yearly income of companies, with and without missing data

yearly income	**Absolute Frequency**	**Relative Frequency**	**Relative Frequency w/out Missing**
< BRL 2.4 million	47	12.18%	12.43%
BRL 2.4 – 16 million	76	19.69%	20.11%
BRL 16 million – 90 million	51	13.21%	13.49%
BRL 90 million – 300 million	36	9.33%	9.52%
> BRL 300 million	168	43.52%	44.44%
Missing	8	2.07%	
Total	386	100.00%	100.00%

In general terms, the sample is considered somewhat good and interesting for the purposes of this study, since large, mature, Brazilian companies competing within the services industry constitute the average profile.

4.3.2 Detecting and handling missing data

Most of missing data were already identified and eliminated during previous procedures, especially while searching for responses with more than 2 missing data—a threshold of 2 was settled to enhance data reliability.

As a result, only 3 missing data still remained within the database and they belong respectively to variables PRCT_10, PRCT_15, and PRCT_16. Missing datum or data of a single variable did not led to the discard of other data of the same respondent because variables were handled separately.

Possible reasons for the emergence of missing data include (1) partial or no understanding of the proposed question and (2) unwillingness or, more commonly noticed during the field research, incapability of the respondent to provide an answer to a question. Partial or no understanding of the proposed questions may have derived from inaccurate wording. Nevertheless, as the questionnaire was subjected to external validation, these missing data can be negligible for the purposes of this study.

4.3.3 Detecting and handling univariate outliers

The method of standardized scores was deployed to detect outliers and score values exceeding the threshold of ±3 were considered outliers (Martins & Theóphilo, 2009). An MS-Excel spreadsheet was deployed to perform the calculations of the standardized scores (detailed formulas provided in the methodological procedures). No univariate outliers were detected and therefore, no additional procedures are to be performed.

4.3.4 Performing univariate normality tests

Three methods were performed in order to test the univariate normality of data. The first included the visual analysis of histogram, normal Q-Q plot, and Boxplot (generally this set is regarded as the graphical analysis of normality). The second method included two specific statistical tests for normality: the Shapiro-Wilk test (Razali & Wah, 2011, Shapiro & Wilk, 1965) and a modification of the Kolmogorov-Smirnov test (considering the Lilliefors significance correlation). Finally, the third method assessed normality based on the skewness and kurtosis values, according to the formulas and thresholds explained in the methodological procedures (for details, see item 3.4.3).

Normality tests were performed for each variable independently and detailed results are shown in Appendices 31 to 51.

In some cases, moderate departures from normality were observed through the graphical analysis while others resembled normality. In general terms, histograms, boxplots, and normal Q-Q plots showed approximately normal distributions. The shape of the histograms was approximately bell-shaped, boxplots were quite symmetric, and majority of dots sticks to the line in the normal Q-Q plot, except for variables PRCT_04, PRCT_09, PRCT_15, PRCT_16, and PRCT_19, that showed a moderate departure from normality. Therefore, the graphical analyzes are not conclusive about normality of data.

Next, both the Shapiro-Wilk test and the Kolmogorov-Smirnov test indicate departures from normality for all variables. To be considered a normal distribution, the ‘Sig.’ values should exceed ‘.05’, for a significance level of .05, which corresponds to a .05 error level, what was not the case for all variables. The null hypothesis for these tests of normality is that the data are normally distributed. The null hypothesis is rejected if the p-value is below .05. In SPSS, the p-value is labeled ‘Sig.’. Therefore, results cannot keep the null hypothesis and data cannot be considered normally distributed.

Finally, considering the sample size of 300+—already discarding missing data and outliers—, the statistic value (z) for skewness and kurtosis were calculated and shown in Table 52, as follows. If either calculated z values exceed the specified critical value, then the distribution is non-normal. Assuming a significance of .01—confidence of 99%—, critical values are ±2.58, which correspond to a .01 error level. Likewise, at a significance of 0.05—confidence of 95%—, critical values are ±1.96, which correspond to a .05 error level (Hair Jr. et al., 2006).

Table 52 – Skewness and kurtosis of practice variables

Calculated statistic values (*z*) for skewness and kurtosis of importance variables								
	$z_{skewness}$	$z_{kurtosis}$		$z_{skewness}$	$z_{kurtosis}$		$z_{skewness}$	$z_{kurtosis}$
PRCT_01	$-.79^{*}$	-3.23	PRCT_08	-1.42^{*}	-3.04	PRCT_15	1.28^{*}	-3.77
PRCT_02	-2.38^{**}	-2.69	PRCT_09	-4.64	-1.77^{*}	PRCT_16	1.83^{*}	-3.85
PRCT_03	-1.78^{*}	-3.54	PRCT_10	-1.23^{*}	-3.04	PRCT_17	-1.63^{*}	-2.44^{**}
PRCT_04	1.89^{*}	-3.41	PRCT_11	-1.61^{*}	-2.99	PRCT_18	-2.15^{**}	-2.66
PRCT_05	-2.00^{**}	-2.62	PRCT_12	$-.40^{*}$	-3.77	PRCT_19	-3.11	-3.07
PRCT_06	-2.12^{**}	-2.97	PRCT_13	-2.43^{**}	-3.27	PRCT_20	-1.96^{*}	-3.12
PRCT_07	$-.28^{*}$	-3.09	PRCT_14	$-.23^{*}$	-3.29	PRCT_21	-3.39	-2.63

Legend: * Significant at .01 significance level

** Significant at .01 significance level

$z_{skewness}$ = statistic value for skewness

$z_{kurtosis}$ = statistic value for kurtosis

A fairly similar result of the calculated *z* is derived by dividing the statistics by the appropriate standard errors of .106 (skewness) and .212 (kurtosis) (Doane, & Seward, 2011, Cramer, & Howitt, 2004, Cramer, 1998).

As a result, all variables hold a platykurtic—flatter—distribution. This is due to the negative values of kurtosis. Regarding skewness, almost every variable would be considered normal, except for variables PRCT_09, PRCT_19, and PRCT_21. Therefore considering skewness and kurtosis values simultaneously, it is possible to assume non-normality of data.

Therefore because all normality tests indicate non-normal distribution of variables, non-parametric tests were deployed for comparing means among innovation drivers. Non-parametric tests are also known as distribution-free tests because it is unnecessary to hold any assumption about the probability distribution model of the population (Martins & Theóphilo, 2009).

4.3.5 Comparing means between innovation drivers

According to the methods for comparing means depicted in the methodological procedures, the non-parametric test of Wilcoxon was selected to compare means of all innovation drivers. The Wilcoxon signed ranks test is a non-parametric test suitable for comparing two related samples. The null hypothesis for these tests of means comparison is that there is no difference between the two groups. Therefore, if the null hypothesis is accepted, there is no evidence that the two samples come from different populations. Otherwise, rejecting the null hypothesis is evidence that there is difference between the two groups, hence the samples belong to different populations (Martins & Theóphilo, 2009). Cases can be considered related because the respondent for all innovation drivers is the same.

First, descriptive statistics were calculated for all 21 variables. Results are presented in Appendices 31 to 51. The right columns of Table 53 show the descending sort of innovation drivers regarding practice.

Table 53 – Raking of means of practice variables

Absolute means			Ranking of means		
PRCT_01	4.025		1	PRCT_09	4.753
PRCT_02	4.378		2	PRCT_19	4.680
PRCT_03	4.219		3	PRCT_21	4.634
PRCT_04	3.454		4	PRCT_13	4.432
PRCT_05	4.399		5	PRCT_05	4.399
PRCT_06	4.279		6	PRCT_17	4.389
PRCT_07	3.882		7	PRCT_02	4.378
PRCT_08	4.135		8	PRCT_06	4.279
PRCT_09	4.753		9	PRCT_18	4.272
PRCT_10	4.004		10	PRCT_20	4.230
PRCT_11	4.131		11	PRCT_03	4.219
PRCT_12	3.998		12	PRCT_08	4.135
PRCT_13	4.432		13	PRCT_11	4.131
PRCT_14	3.868		14	PRCT_01	4.025
PRCT_15	3.542		15	PRCT_10	4.004
PRCT_16	3.384		16	PRCT_12	3.998
PRCT_17	4.389		17	PRCT_07	3.882
PRCT_18	4.272		18	PRCT_14	3.868
PRCT_19	4.680		19	PRCT_15	3.542
PRCT_20	4.230		20	PRCT_04	3.454
PRCT_21	4.634		21	PRCT_16	3.384

A paired Wilcoxon test was conducted: the highest mean compared to the second highest mean. Then, the second highest mean compared to the third highest mean, and so forth. Tables 54 and 55 present the results of the Wilcoxon test in SPSS.

Table 54 – Wilcoxon test for comparing means regarding practice variables

	prct_19 & prct_09	prct_21 & prct_19	prct_13 & prct_21	prct_02 & prct_13	prct_05 & prct_02	prct_17 & prct_05	prct_06 & prct_17	prct_18 & prct_06	prct_03 & prct_18	prct_08 & prct_03
z	-.939	-.665	-1.113	-.414	-.299	-.158	-1.262	-.099	-.038	-.439
Asymp. Sig. (2-tailed)	.348	.506	.266	.679	.765	.874	.207	.921	.969	.661

Table 55 – Wilcoxon test for comparing means regarding practice variables (cont.)

	prct_11 & prct_08	prct_20 & prct_11	prct_12 & prct_20	prct_01 & prct_12	prct_10 & prct_01	prct_07 & prct_10	prct_14 & prct_07	**prct_15 & prct_14**	prct_04 & prct_15	prct_16 & prct_04
z	-.112	-.618	-1.033	-.190	-.240	-1.159	-.748	**-2.284**	-1.318	-.645
Asymp. Sig. (2-tailed)	.911	.536	.302	.849	.810	.247	.454	**.022**	.188	.519

The results of the Wilcoxon signed ranks test were based on positive ranks and show both the statistic values (z) and the asymptotic significances. Only the comparison between PRCT_01 and PRCT_12 was based on negative ranks. With a significance of .05, z values should be outside the threshold of ±1.96 in case of statistically different means. With a significance of .01, z values should be outside the threshold of ±2.58. Likewise, the 'Asymp. Sig.' should be below .05 to indicate statistically different means—significance of .05.

Different means appear only when comparing variables PRCT_15 and PRCT_14. Therefore, there is the emergence of two groups: one big group comprises all variables, except for variables PRCT_15 (structure), PRCT_04 (time), and PRCT_16 (reward system), which constitute the other group—the one with lower practice.

4.3.6 Analyzing main findings

In general terms, innovation drivers are only moderately practiced in companies, since most practiced innovation driver (diffusion) shows a mean of 4.753—within a 1-7 scale—and the lowest practiced innovation driver (reward systems) shows a mean of 3.384. All other innovation drivers have a mean in between these extremes. What first draws the attention is the big difference between the practice and the importance of innovation drivers. Respondents claim the lowest mean for importance is 4.712 (portfolio management), which is almost the same value of the most practiced innovation driver (diffusion). To this regard, although further research is necessary, in general terms, innovation drivers are less practiced than they should—considering the importance assigned to them. This is a typical issue of importance versus practice—or presence, as noted by some authors—in companies: although executives consider a certain initiative important, their company does not have it fully developed. Clearly establishing the conceptual difference between them may prevent researchers from deriving erroneous conclusions. Therefore, this study may support others in the sense of stimulating field research containing research questions on both importance and practice (and not only one of them).

Considering the neutral point to be around 4.0, the general mean for the practice of all innovation drivers is no greater than 4.147. Although literature recommends companies to implement innovation drivers, it is still scarce in terms of what are those really practiced in companies. Therefore this part of the study may shed some light on practice of innovation drivers and provide managers with some contribution about what to do in terms of less practiced innovation drivers.

The three less practiced innovation drivers are: structure, time, and reward system. Although literature posits these three innovation drivers as being important for a company to innovate, this study has found that they are the less practiced in companies. It may derive from some reasons: (1) complexity, (2) short term focus, and (3) culture.

Structures prone to foster innovation are those less hierarchical and with clear definition of roles. This definition clearly matches the big picture one may have about innovation. Nevertheless, companies are immersed in a complex internal and external environment that encompasses corporate functions, different activities, lines of command, power, status, and of course globalization, just to cite some. Vasconcellos (2008a) presents, for example, organizational structures for a company to compete. They include: functional division, geographical division, project division, client division, business unit division, product line division, matrix structure and so forth. As a result, it is fairly tough for a company to have less hierarchical structures, especially when this is a big company, which is the profile of the sample of this study. Another issue to debate regards the industry in which the company competes: some industries require very agile and flexible structures even if the whole company is very big. These are the cases for instance of companies belonging to these industries: software development (and other digital businesses), auditing, and consultancy. Not only structures of the cells are less hierarchical, but also the individual roles are well defined. Examples are innumerous and include Microsoft, Deloitte, KPMG, Ernst & Young, McKinsey & Co, A.T. Kearney, Bain & Co., and many others.

Another less practiced innovation driver is time. The iconic cases of 3M and Google related to allowing employees to have up to 20% of their time to personal projects have been well unveiled and admired. Time innovation driver refers to allocating adequate working time for employees to conduct new and even personal ventures. A possible reason why time was classified as one of the least practiced innovation driver may be the short-term focus of management in most companies. On the one hand, allocating time for personal projects is a medium to long term decision, whereas not allocating time for personal projects is a short term decision. When this tradeoff is weighted, in general terms, decision is prone to exploitation—as an opposition to exploration (March, 1991). Exploitation is less risky and results are immediate, while exploring demands more resources, it is risky and chances of new discoveries are relatively low depending on the company and industry.

Although well documented in the literature, the practice of reward systems is still scarce in companies operating in Brazil. The concept of reward systems refers to establishing and disseminating a clear reward program that benefit those who bring contributions to the company. Developing a program to reward those who bring innovative contributions to the company is still not part of the corporate culture in Brazil, as it is in companies operating in other parts of the world. There seems to exist a complex form of payment to employees, in which direct financial bonus is subject to high taxation. Moreover, corporate policies regarding joint patents, for example, are uncommon. As a result, in most cases, when an employee comes with an innovative contribution to the company, it is regarded as ‘it is no more than your duty, thank you’. And it seems quite fair for the employee as well because, in most cases, the tacit recognition of immediate superior is more important than revenues from patents or other long term benefit.

Regarding the other group, the one with most practiced innovation drivers, although it was not possible to statistically distinguish means between them, it is also not possible to claim that all drivers are equally practiced in companies. This should be subject of future studies as well.

Finally, hypothesis 3— innovation drivers would be not equally practiced in companies—was accepted.

4.4 Identifying the associations of importance and practice of innovation drivers

The forth hypothesis of this study is described as follows:

Hypothesis 4 (conceptual level)

Innovation drivers would show similarities regarding importance and practice.

Hypothesis 4 (empirical level)

Innovation drivers would be grouped into clusters regarding the joint combination of importance and practice.

This hypothesis was tested through the use of the statistical technique of cluster analysis.

4.4.1 Describing the scatterplot

The scatterplot is considered the most popular method for examining bivariate relationships. It is a graph of data points based on two variables. The practice variable defines the horizontal axis while the importance variable defines the vertical axis. Both variables are metric and measured within a 1-7 scale. The pattern of points represents the relationship between practice and importance. Figure 40, next, shows the scatterplot of variables practice and importance.

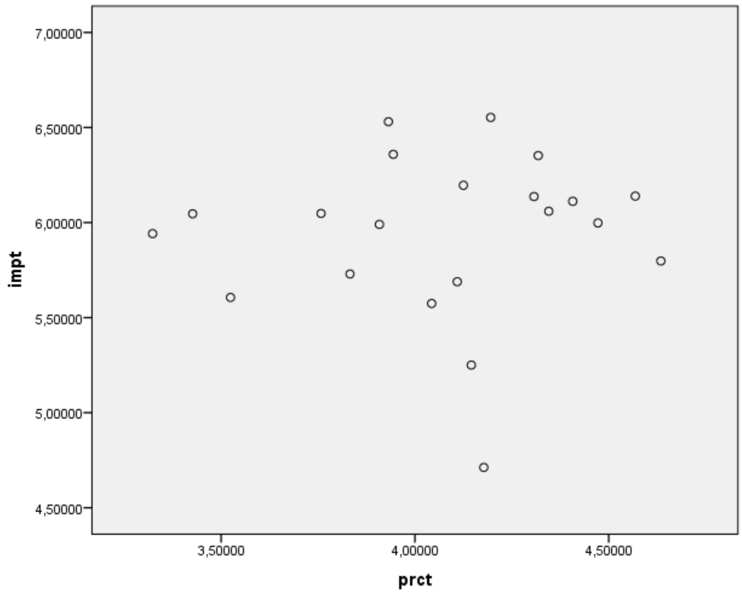

Figure 40 – Scatterplot of importance and practice of innovation drivers
impt = innovation driver importance (1-7 scale)
prct = innovation driver practice (1-7 scale)

According to the visual inspection of the scatterplot, no pattern can be depicted and the dots seem to be randomly distributed. In this case, a cluster analysis is adequate and it was deployed in order to identify possible innovation driver clusters.

4.4.2 Identifying the innovation driver clusters – cluster analysis

Cluster analysis is a useful tool to aid the researcher in finding objects that have common behavior in terms of the inspected variables (Coopers, & Schindler, 2008). In this case, such common behavior is expected to derive from importance and practice of innovation drivers.

Importance of each innovation driver was calculated by identifying whether one driver would show greater importance mean than others or not. This was the procedure adopted in testing SG1. Likewise, practice of innovation driver was calculated by identifying whether one driver would show greater practice man than other drivers or not. This was the procedure adopted in testing SG3.

For the purposes of testing SG4—describe the gaps between importance and practice of innovation drivers—a cluster analysis is deployed, using the Euclidian distance for measures calculations and the Ward's linkage as the clustering algorithm. Statistics are based on cases with no missing values for any variables used.

Figure 41, next, exhibits the distances between cases and the degree to which a case has higher likelihood to pertain to a certain cluster.

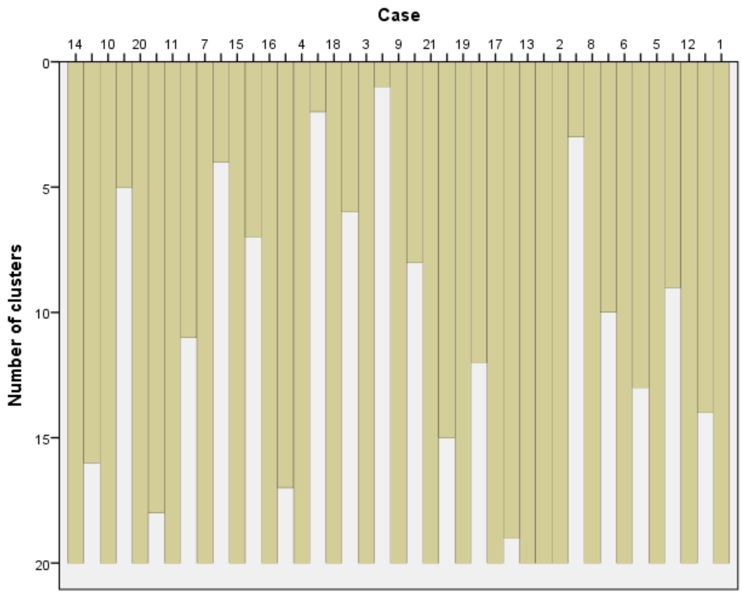

Figure 41 – Distance measure and number of clusters per case

The resulting dendrogram is presented in Figure 42, as follows.

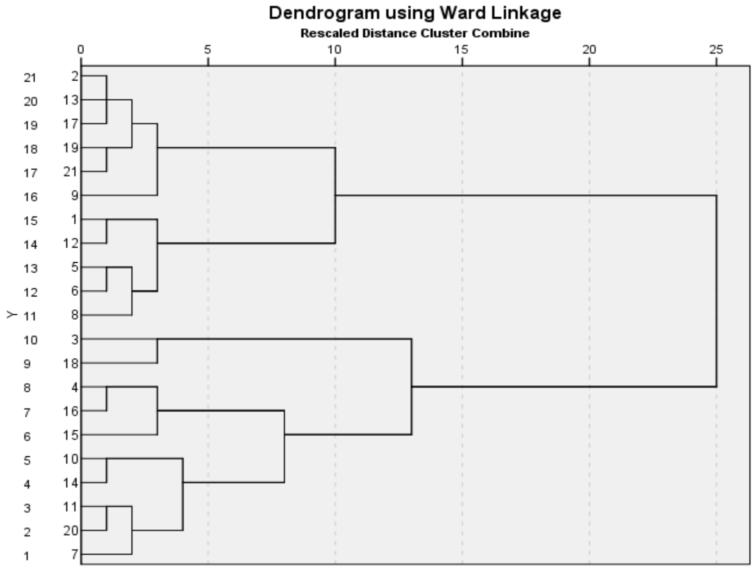

Figure 42 – Dendrogram of resulting clustering

Five clusters seem to be quite identifiable: cluster 1 encompasses six variables (technologies, diffusion, open communication, workplace environment, competitive forces, and strategic alliances), cluster 2 encompasses five variables (people, intellectual capital, generation, conversion, and leadership), cluster 3 encompasses two variables (funding and portfolio management), cluster 4 encompasses three variables (time, structure, and reward systems), and cluster 5 encompasses the last five variables (capture, values, risk management, strategy, and institutions). Figure 43, next, provides a visual understanding of the five depicted clusters. Straight lines represent the median of each variable: practice (PRCT) and importance (IMPT).

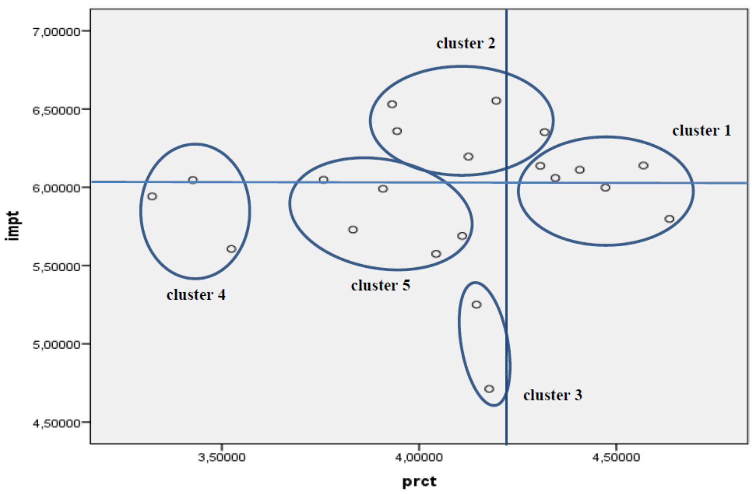

Figure 43 – Final clustering scatterplot

4.4.3 Analyzing main findings

The hierarchical cluster analysis yields to a very good understanding of the associative relations between practice and importance of innovation drivers. Labels were provided to each cluster, according to the general behavior of the innovation drivers pertaining to that cluster, in terms of practice and importance, as follows.

Cluster 1: ‘The Most Practiced’ Innovation Drivers. This cluster encompasses the most practiced innovation drivers. Moreover, all drivers pertaining to this cluster have only an intermediate classification in terms of importance. Therefore, in general terms, drivers pertaining to this cluster should not be prioritized while implementing innovation initiatives. The main reason is that these drivers are already the most practiced in companies.

Cluster 2: ‘The Most Important’ Innovation Drivers. This cluster encompasses the most important innovation drives. Although these drivers are considered the most important, they are not the most practiced. As a result, in general terms, drivers pertaining to this cluster should be prioritized while implementing innovation initiatives. The main reason is that these drivers are considered important, but not fully practiced in companies.

Cluster 3: ‘The Least Important’ Innovation Drivers. This cluster encompasses the least important innovation drivers. Moreover, both drivers pertaining to this cluster have an intermediate classification in terms of practice. Therefore, in general terms, drivers pertaining to this cluster should not be prioritized while implementing innovation initiatives. The main reason is that these drivers are somehow practiced in companies even if they are not considered important.

Cluster 4: ‘The Least Practiced’ Innovation Drivers. This cluster encompasses the least practiced innovation drivers. Moreover, all drivers pertaining to this cluster have only an intermediate classification in terms of importance. Therefore, in general terms, drivers pertaining to this cluster should not be prioritized while implementing innovation initiatives. The main reason is that these drivers are not considered important—in relative terms.

Cluster 5: ‘Not the Most, Not the Least’ Innovation Drivers. This cluster encompasses the innovation drivers that are not the most important or the most practiced. And at the same time, they are not the least important or the least practiced. Albeit the natural bias of considering it an unimportant cluster, it seems to be the second to be prioritized—just after Cluster 2—because drivers pertaining to this cluster have an intermediate classification in terms of importance, but an enormous potential to be put into practice, since their classification in terms of practice is fairly low.

Thus, the cluster analysis resulted in the identification of five clusters. Such classification is somewhat useful for managerial purposes since it provides a company with a sense of prioritization.

In the first place, innovation drivers pertaining to Cluster 2—'The Most Important' Innovation Drivers—should be put into practice. Such innovation drivers include: people, intellectual capital, generation, conversion, and leadership. These findings are somewhat convergent to previous discussion, since generation, people, leadership, and intellectual capital have already been identified as the most important innovation driver—output of SG1. The novelty here is the inclusion of conversion as an important innovation driver. To this regard, Hansen and Birkinshaw (2007) propose conversion as vital for innovation to take place. The concept of conversion is as simple as converting ideas into feasible projects. Albeit their unequivocally importance as the seeds to nurture innovation, creativity and idea generation cannot provide innovation alone. Roberts (2007), Popadiuk and Choo (2006), and Freeman (1982) couple up this new idea to its implementation into a new product, process, or service. Urabe (1998) figures up that such new product, process, or service lead to a creation of pure profit for the company.

In general terms, managers should take Figure 43 as a current state-of-art map of the association between importance and practice. Nevertheless, this clustering picture is the first step for action taking: after calculating the practice of each innovation driver for their own companies, these managers are capable of plotting the dots in a scatterplot (importance comes from the findings of this study and practice is specific for the inspected company). Then, the attempt is to have as many innovator drivers as possible in the right side of the plot (high practice). Albeit its simplicity, this tool may immensely aid managers in the task of prioritizing innovation initiatives to be performed.

To sum up, hypothesis 4— innovation drivers would show similarities regarding importance and practice—was accepted.

4.5 Describing the relations between innovation drivers and internationalization degree

The fifth hypothesis of this study is described as follows. This hypothesis was tested through the use of the statistical technique of multiple linear regression:

Hypothesis 5 (conceptual level)
Innovation would have positive effects on internationalization.

Hypothesis 5 (empirical level)
The practice of innovation drivers would explain positively the internationalization degree.

Description of collected data, detection and handle of missing data are no longer necessary for the purposes of describing the relations between innovation drivers and internationalization degree because the input variables were subject to those analyzes in items 4.3.1 and 4.3.2.

4.5.1 Detecting and handling multivariate outliers

When more than two variables are considered, the researcher needs a means to objectively measure the multidimensional position of each observation relative to some common point. This issue is addressed by the Mahalanobis D^2 measure, which is a multivariate assessment of each observation across a set of variables. Higher D^2 values represent observations farther removed from the general distribution of observations. The Mahalanobis D^2 measure has statistical properties that allow for significance testing. The D^2 measure divided by the number of variables involved (*df*—degrees of freedom) is approximately distributed as a *t*-value. Observations having a D^2/df value exceeding 3 or 4 in large samples can be designated as possible outliers (Hair Jr. et al., 2006). Due to operational constraints of the SPSS output in terms of individual identification of outliers, calculations of the D^2 measure were not performed.

4.5.2 Performing multivariate normality tests

Although it is important to understand how the distribution departs from normality in terms of shape and whether these values are large enough to warrant attention, the researcher must also consider the effects of sample size. For samples sizes of 200 or more, the impacts of non-normality on results may be negligible as the detrimental effects can even be canceled out. Therefore, in most instances, as the sample sizes become large, the researcher can be less concerned about non-normal variable (Hair et al., 2006). For the purposes of this study, the sample size ($n > 300$) surpasses the threshold of 200.

This procedure was adopted for this study because it would otherwise hamper the use of the dependence technique of multiple regression analysis.

4.5.3 Identifying innovation drivers as predictors of internationalization degree

In order to describe the relations between innovation drivers—input variables—and internationalization outputs, the statistical technique of multiple linear regression is recommended and therefore employed. Coopers and Schindler (2008) stress the use of multiple regression technique as a descriptive tool to develop an equation for estimating an output variable considering several input variables. In the case of this study, input variables include all 21 innovation drivers and output variable varies depending on the estimation being tested. All 21 input variables are within a 1-7 scale. Seven tests are performed, in this order: 21 innovation drivers explaining (1) income from abroad, (2) number of host countries, (3) number of employees abroad, (4) internationalization maturity, (5) psychic difference of host countries, (6) internationalization commitment, and (7) internationalization degree. As previously defined, internationalization degree is defined as a composite single mean of all other six internationalization output values. All seven output variables are within a 1-7 scale as well. The applied regression method is ‘stepwise’.

4.5.3.1 Innovation drivers as predictors of *income from abroad*

This statistical test estimates income from abroad as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 44, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,227[a]	,052	,049	2,503
2	,270[b]	,073	,068	2,478

a. Predictors: (Constant), prct_03

b. Predictors: (Constant), prct_03, prct_17

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	128,399	1	128,399	20,498	,000[b]
	Residual	2361,521	377	6,264		
	Total	2489,921	378			
2	Regression	181,385	2	90,692	14,771	,000[c]
	Residual	2308,536	376	6,140		
	Total	2489,921	378			

a. Dependent Variable: intl_01

b. Predictors: (Constant), prct_03

c. Predictors: (Constant), prct_03, prct_17

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,793	,321		5,577	,000
	prct_03	,325	,072	,227	4,527	,000
2	(Constant)	,953	,428		2,229	,026
	prct_03	,282	,072	,197	3,898	,000
	prct_17	,235	,080	,149	2,938	,004

a. Dependent Variable: intl_01

Figure 44 – Innovation drivers describing income from abroad

Model 1 reflects income from abroad being explained by funding innovation driver alone:

$$income\ from\ abroad = 1.793 + 0.325 * (funding)$$

Model 2 reflects income from abroad being explained by the joint effect of funding and workplace environment innovation drivers:

$$income\ from\ abroad = .953 + .282 * (funding) + .235 * (workplace\ environment)$$

Table 56 provides a summary of descriptors, significance level, and power of explanation of models explaining income from abroad.

Table 56 – A summary of innovation drivers describing income from abroad

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	funding	.01	5.2%
2	funding, workplace environment	.05	7.3%

4.5.3.2 Innovation drivers as predictors of *number of host countries*

This Statistical test estimates number of host countries as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 45, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,237[a]	,056	,053	2,298
2	,286[b]	,082	,077	2,270
3	,305[c]	,093	,086	2,259
4	,327[d]	,107	,098	2,244

a. Predictors: (Constant), prct_03
b. Predictors: (Constant), prct_03, prct_09
c. Predictors: (Constant), prct_03, prct_09, prct_13
d. Predictors: (Constant), prct_03, prct_09, prct_13, prct_15

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	119,296	1	119,296	22,585	,000[b]
	Residual	2012,464	381	5,282		
	Total	2131,760	382			
2	Regression	173,910	2	86,955	16,877	,000[c]
	Residual	1957,850	380	5,152		
	Total	2131,760	382			
3	Regression	197,964	3	65,988	12,933	,000[d]
	Residual	1933,795	379	5,102		
	Total	2131,760	382			
4	Regression	228,072	4	57,018	11,322	,000[e]
	Residual	1903,688	378	5,036		
	Total	2131,760	382			

a. Dependent Variable: intl_02
b. Predictors: (Constant), prct_03
c. Predictors: (Constant), prct_03, prct_09
d. Predictors: (Constant), prct_03, prct_09, prct_13
e. Predictors: (Constant), prct_03, prct_09, prct_13, prct_15

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1,987	,295		6,739	,000
	prct_03	,312	,066	,237	4,752	,000
2	(Constant)	1,200	,378		3,172	,002
	prct_03	,247	,068	,187	3,642	,000
	prct_09	,228	,070	,167	3,256	,001
3	(Constant)	,869	,406		2,140	,033
	prct_03	,227	,068	,172	3,336	,001
	prct_09	,172	,075	,126	2,303	,022
	prct_13	,153	,070	,117	2,171	,031
4	(Constant)	1,012	,408		2,482	,014
	prct_03	,235	,068	,178	3,468	,001
	prct_09	,194	,075	,142	2,603	,010
	prct_13	,236	,078	,180	3,035	,003
	prct_15	-,184	,075	-,140	-2,445	,015

a. Dependent Variable: intl_02

Figure 45 – Innovation drivers describing number of countries

Model 1 reflects number of host countries being explained by funding innovation driver alone:

$$number\ of\ host\ countries = 1.987 + .312 * (funding)$$

Model 2 reflects number of host countries being explained by the joint effect of funding and diffusion innovation drivers:

$$number\ of\ host\ countries = 1.200 + .247 * (funding) + .228 * (diffusion)$$

Model 3 reflects number of host countries being explained by the joint effect of funding, diffusion, and open communication innovation drivers:

$$number\ of\ host\ countries = .869 + .227 * (funding) + .172 * (diffusion) + .153 * (open\ communication)$$

Model 4 reflects number of host countries being explained by the joint effect of funding, diffusion, open communication, and structure innovation drivers:

$$number\ of\ host\ countries = 1.012 + .235 * (funding) + .194 * (diffusion) + .236 * (open\ communication) - .184 * (structure)$$

Table 57 provides a summary of descriptors, significance level, and power of explanation of models explaining number of host countries.

Table 57 – A summary of innovation drivers describing number of host countries

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	funding	.01	5.6%
2	funding, diffusion	.01	8.2%
3	funding, diffusion, open communication	.05	9.3%
4	funding, diffusion, open communication, structure	.05	10.7%

4.5.3.3 Innovation drivers as predictors of *number of employees abroad*

This Statistical test estimates number of employees abroad as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 46, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,283[a]	,080	,078	2,575
2	,323[b]	,105	,100	2,544

a. Predictors: (Constant), prct_03

b. Predictors: (Constant), prct_03, prct_10

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	219,821	1	219,821	33,154	,000[b]
	Residual	2526,163	381	6,630		
	Total	2745,984	382			
2	Regression	287,290	2	143,645	22,201	,000[c]
	Residual	2458,695	380	6,470		
	Total	2745,984	382			

a. Dependent Variable: intl_03

b. Predictors: (Constant), prct_03

c. Predictors: (Constant), prct_03, prct_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,381	,330		4,182	,000
	prct_03	,423	,074	,283	5,758	,000
2	(Constant)	,678	,392		1,729	,085
	prct_03	,345	,077	,231	4,513	,000
	prct_10	,262	,081	,165	3,229	,001

a. Dependent Variable: intl_03

Figure 46 – Innovation drivers describing number of employees abroad

Model 1 reflects number of employees abroad being explained by funding innovation driver alone:

$$number\ of\ employees\ abroad = 1.381 + .423 * (funding)$$

Model 2 reflects number of employees abroad being explained by the joint effect of funding and values innovation drivers:

$$number\ of\ employees\ abroad = .678 + .345 * (funding) + .262 * (values)$$

Table 58 provides a summary of descriptors, significance level, and power of explanation of models explaining number of employees abroad.

Table 58 – A summary of innovation drivers describing number of employees abroad

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	funding	.01	8.0%
2	funding, values	.10	10.5%

4.5.3.4 Innovation drivers as predictors of *internationalization maturity*

This Statistical test estimates internationalization maturity as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 47, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,265[a]	,070	,068	2,319
2	,308[b]	,095	,090	2,291
3	,324[c]	,105	,098	2,282
4	,342[d]	,117	,107	2,269

a. Predictors: (Constant), prct_03
b. Predictors: (Constant), prct_03, prct_09
c. Predictors: (Constant), prct_03, prct_09, prct_13
d. Predictors: (Constant), prct_03, prct_09, prct_13, prct_15

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153,953	1	153,953	28,619	,000[b]
	Residual	2044,186	380	5,379		
	Total	2198,139	381			
2	Regression	208,935	2	104,468	19,904	,000[c]
	Residual	1989,203	379	5,249		
	Total	2198,139	381			
3	Regression	230,537	3	76,846	14,763	,000[d]
	Residual	1967,602	378	5,205		
	Total	2198,139	381			
4	Regression	256,664	4	64,166	12,460	,000[e]
	Residual	1941,474	377	5,150		
	Total	2198,139	381			

a. Dependent Variable: intl_04
b. Predictors: (Constant), prct_03
c. Predictors: (Constant), prct_03, prct_09
d. Predictors: (Constant), prct_03, prct_09, prct_13
e. Predictors: (Constant), prct_03, prct_09, prct_13, prct_15

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,815	,298		6,098	,000
	prct_03	,355	,066	,265	5,350	,000
2	(Constant)	1,025	,382		2,681	,008
	prct_03	,290	,069	,216	4,232	,000
	prct_09	,229	,071	,165	3,237	,001
3	(Constant)	,712	,410		1,737	,083
	prct_03	,270	,069	,202	3,926	,000
	prct_09	,175	,075	,126	2,318	,021
	prct_13	,145	,071	,109	2,037	,042
4	(Constant)	,846	,412		2,051	,041
	prct_03	,278	,069	,208	4,055	,000
	prct_09	,196	,076	,142	2,598	,010
	prct_13	,222	,079	,167	2,820	,005
	prct_15	-,171	,076	-,128	-2,252	,025

a. Dependent Variable: intl_04

Figure 47 – Innovation drivers describing internationalization maturity

Model 1 reflects internationalization maturity being explained by funding innovation driver alone:

$$internationalization\ maturity = 1.815 + .355 * (funding)$$

Model 2 reflects internationalization maturity being explained by the joint effect of funding and diffusion innovation drivers:

$$internationalization\ maturity = 1.025 + .290 * (funding) + .229 * (diffusion)$$

Model 3 reflects internationalization maturity being explained by the joint effect of funding, diffusion, and open communication innovation drivers:

$$internationalization\ maturity = .712 + .270 * (funding) + .175 * (diffusion) + .145 * (open\ communication)$$

Model 4 reflects internationalization maturity being explained by the joint effect of funding, diffusion, open communication, and structure innovation drivers:

$$internationalization\ maturity = .846 + .278 * (funding) + .196 * (diffusion) + .222 * (open\ communication) - .171 * (structure)$$

Table 59 provides a summary of descriptors, significance level, and power of explanation of models explaining internationalization maturity.

Table 59 – A summary of innovation drivers describing internationalization maturity

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	funding	.01	7.0%
2	funding, diffusion	.01	9.5%
3	funding, diffusion, open communication	.10	10.5%
4	funding, diffusion, open communication, structure	.05	11.7%

4.5.3.5 Innovation drivers as predictors of *psychic difference of host countries*

This Statistical test estimates psychic difference of host countries as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 48, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,230[a]	,053	,050	2,528
2	,276[b]	,076	,071	2,500

a. Predictors: (Constant), prct_03

b. Predictors: (Constant), prct_03, prct_09

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	132,791	1	132,791	20,784	,000[b]
	Residual	2370,367	371	6,389		
	Total	2503,158	372			
2	Regression	190,996	2	95,498	15,282	,000[c]
	Residual	2312,163	370	6,249		
	Total	2503,158	372			

a. Dependent Variable: intl_05

b. Predictors: (Constant), prct_03

c. Predictors: (Constant), prct_03, prct_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,322	,328		7,077	,000
	prct_03	,333	,073	,230	4,559	,000
2	(Constant)	1,511	,420		3,601	,000
	prct_03	,264	,076	,183	3,495	,001
	prct_09	,237	,078	,160	3,052	,002

a. Dependent Variable: intl_05

Figure 48 – Innovation drivers describing psychic difference

Model 1 reflects psychic difference of host countries being explained by funding innovation driver alone:

$$psychic\ difference = 2.322 + .333 * (funding)$$

Model 2 reflects psychic difference of host countries being explained by the joint effect of funding and diffusion innovation drivers:

$$psychic\ difference = 1.511 + .264 * (funding) + .237 * (diffusion)$$

Table 60 provides a summary of descriptors, significance level, and power of explanation of models explaining psychic difference of host countries.

Table 60 – A summary of innovation drivers describing psychic difference

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	funding	.01	5.3%
2	funding, diffusion	.01	7.6%

4.5.3.6 Innovation drivers as predictors of *internationalization commitment*

This Statistical test estimates internationalization commitment as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 49, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,262[a]	,068	,066	2,191
2	,300[b]	,090	,085	2,169

a. Predictors: (Constant), prct_03

b. Predictors: (Constant), prct_03, prct_14

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	129,370	1	129,370	26,951	,000[b]
	Residual	1761,644	367	4,800		
	Total	1891,014	368			
2	Regression	169,684	2	84,842	18,040	,000[c]
	Residual	1721,330	366	4,703		
	Total	1891,014	368			

a. Dependent Variable: intl_06

b. Predictors: (Constant), prct_03

c. Predictors: (Constant), prct_03, prct_14

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1,770	,285		6,204	,000
	prct_03	,330	,064	,262	5,191	,000
2	(Constant)	1,289	,327		3,945	,000
	prct_03	,260	,067	,206	3,851	,000
	prct_14	,206	,070	,156	2,928	,004

a. Dependent Variable: intl_06

Figure 49 – Innovation drivers describing internationalization commitment

Model 1 reflects internationalization commitment being explained by funding innovation driver alone:

$$internationalization\ commitment = 1.770 + .330 * (funding)$$

Model 2 reflects internationalization commitment being explained by the joint effect of funding and strategy innovation drivers:

$$internationalization\ commitment = 1.289 + .260 * (funding) + .206 * (strategy)$$

Table 61, next, provides a summary of descriptors, significance level, and power of explanation of models explaining internationalization commitment.

Table 61 – A summary of innovation drivers describing internationalization commitment

Model	**Descriptors**	**Significance level (Sig.)**	**Power of explanation (R^2)**
1	funding	.01	6.8%
2	funding, strategy	.01	9.0%

4.5.3.7 Innovation drivers as predictors of *internationalization degree*

This Statistical test estimates internationalization degree as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 50, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,280[a]	,078	,076	2,149
2	,325[b]	,106	,101	2,119

a. Predictors: (Constant), prct_03

b. Predictors: (Constant), prct_03, prct_09

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	149,316	1	149,316	32,338	,000[b]
	Residual	1759,206	381	4,617		
	Total	1908,522	382			
2	Regression	202,029	2	101,015	22,494	,000[c]
	Residual	1706,493	380	4,491		
	Total	1908,522	382			

a. Dependent Variable: intl_me

b. Predictors: (Constant), prct_03

c. Predictors: (Constant), prct_03, prct_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,835	,276		6,657	,000
	prct_03	,349	,061	,280	5,687	,000
2	(Constant)	1,062	,353		3,006	,003
	prct_03	,285	,063	,229	4,504	,000
	prct_09	,224	,065	,174	3,426	,001

a. Dependent Variable: intl_me

Figure 50 – Innovation drivers describing internationalization degree

Model 1 reflects internationalization degree being explained by funding innovation driver alone:

$$internationalization\ degree = 1.835 + .349 * (funding)$$

Model 2 reflects internationalization degree being explained by the joint effect of funding and diffusion innovation drivers:

$$internationalization\ degree = 1.062 + .285 * (funding) + .224 * (diffusion)$$

Table 62 provides a summary of descriptors, significance level, and power of explanation of models explaining internationalization degree.

Table 62 – A summary of innovation drivers describing internationalization degree

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	funding	.01	7.8%
2	funding, diffusion	.01	10.6%

4.5.3.8 Analyzing main findings

In general terms, no set of descriptors is capable of describing variations of internationalization outputs in more than 12%, which is low. To this regard, some models describe no more than 6%. Therefore, the main consideration is that innovation drivers seem not to alone describe internationalization outputs.

Considering the most comprehensive outlook, the funding innovation driver—which means the amount of financial resources directed to innovation—seems to hold the tightest relation with internationalization outputs. It explains, alone, 5.2% of variations in income from abroad, 5.6% of variations in number of host countries, 8.0% of variations in number of employees abroad, 7.0% of variations in internationalization maturity, 5.3% of variations in psychic difference of host countries, 6.8% of variations in internationalization commitment, and 7.8% of variations in internationalization degree. Regarding a threshold of 12% of explanation in variations of outputs for all models, these numbers for the funding innovation driver appear promising. One possible reason for this result revolve about an indirect fact: companies directing more financial resources to innovation ought to be the same companies that direct more financial resources to internationalization. Therefore, it may happen that innovation driver funding and internationalization degree do not hold a cause-and-effect relation. Rather, they might have an intrinsic underlying factor affecting both at the same time: companies with abundant financial resources that drive such resources for both innovation and internationalization. Another possible reason for the resulting funding innovation driver to explain variations of internationalization outputs more than other drivers is, again, an indirect effect. As a company heads financial resources to innovation, it is expected that this company eventually achieves higher levels of new products, services, or processes. And one expected way to put this innovation into the market is landing such new products, services, or processes beyond domestic borders. Therefore, as claimed by Prioste and Yokomizo (2012), internationalization has been a growth alternative for companies to reach new markets, to gain scale and scope economies, to increase firm security and, as a consequence, to increase profitability.

The second most relevant innovation driver as a descriptor of internationalization outputs is diffusion, which means the capability of a company to launch projects to the market. In other words, it regards the easiness of successfully introducing a new product, service, or process into the market. Diffusion appears as a descriptor of the number of host countries, explaining 8.2% of the variation in number of host countries—together with funding innovation driver. Also in conjunction with the funding innovation driver, diffusion explains 9.5% of the variation in internationalization maturity, 7.6% in psychic difference of host countries, and 10.6% in internationalization degree. The inclusion of diffusion innovation driver seems to be plausible while explaining internationalization outputs—even if levels of explanation are low. It is acceptable that when a company has already generated ideas, captured them, and converted them into new products, services, or processes, the next step is introducing them into the market. In this sense, introducing them into the market may include markets other than the domestic one. As a result, during the diffusion stage of the innovation process, internationalization turns to be another reasonable means by which the company reaches more potential consumers.

Open communication and structure innovation driver are the third most relevant innovation drivers that describe part of the variation in two of internationalization outputs, say: number of host countries and internationalization maturity. Jointly with funding and diffusion innovation drivers, open communication and structure explains 10.7% and 11.7% of the variation in number of host countries and internationalization maturity, respectively. Without considering structure, the joint effect of funding, diffusion, and open communication explains 9.3% and 10.5% of the variation in number of host countries and internationalization maturity, respectively. A notable remark on those both cases, number of host countries and internationalization maturity, is that the same four descriptors emerge from the linear regression output, following this order of significance: funding, diffusion, open communication, and structure.

Open communication refers to the capability a company possesses to eliminate barriers for people inside and outside the company to openly or freely establish communication with each other. Open communication is likely to explain higher levels of internationalization because openly communicating with other employees, bosses, peers, partners, and other institutions in the market is a sine-qua-non condition for a company to go international. Inside communication includes people from a subsidiary unit to get in touch with people in the headquarters. On the other hand, outside communication encompasses people of the internationalized company to communication with host country's agents: consumers, partners, governmental entities, allies, employees, unions, and others. Therefore, the rationale is that open communication sounds not odd while explaining these two internationalization outputs: number of host countries and internationalization maturity.

Likewise, structure is also likely to explain part of the variation in number of host countries and internationalization maturity because less hierarchical organizational structures with clear definition of roles are far easier to land overseas than very complex—and often confused—organizational structures where hierarchical levels are innumerous and roles are not well defined. A very good example of this encompasses strategic management consultancy firms, such as McKinsey & Co., A.T. Kearney, Bain & Co., Boston Consulting Group, just to cite some. Hierarchical levels from Vice Presidents to interns account for no more than five or six. And the same organizational structure is deployed in all offices where they operate, no matter the region or the country. Furthermore, roles of each level are so clear that a common practice of these companies is to exchange consultants between offices: a business analyst at office A is expected to perform the same roles at office B. Nevertheless, present results show a completely opposite figure: structure seem to negatively influence both number of host countries and internationalization maturity. One possible reason for this odd result might include the fact that when a company decides to go international to a large number of countries and stays there for a longer period of time, the organizational structure of the company as a whole undergoes an utter renewal. For example, the sole fact of starting operating beyond borders compels the company to embrace a geographical facet regarding the organizational structure. Thereby, the resulting organizational structure turns to be far more complex than the original one.

Other three innovation drivers—workplace environment, values, and strategy—provide only a minor contribution in terms of explanation of variations in income from abroad, number of employees abroad, and internationalization commitment. Together with funding innovation driver, workplace environment explains 7.3% of the variation in income from abroad. And together with funding innovation driver, strategy explains 9.0% of the variation in internationalization commitment.

Workplace environment refers to the levels of organization climate. It is not innovation-specific and therefore, the level of organization climate may explain part of the variation in income from abroad. The underlying rationale is that companies where employees are more satisfied are more likely to have more income from abroad. The direct relation is that employees that are more satisfied with the company are more committed and they bring better overall results, no matter whether they work locally or globally. The indirect relation is that more satisfied employees are also those more committed to internationalization initiatives because they pursue the company's products, services, or processes to achieve more and more consumers—domestically and abroad.

Strategy explains 9.0% of the variation in internationalization commitment. Although the explaining power of strategy as predictor of internationalization commitment is as low as 9.0%, there seems to be a quite reasonable relation between them. Whenever a company has a strategy orientated to innovation—and this is the meaning of the strategy innovation driver—it might carry an effect on the commitment level. Main reason encompasses exploring and exploiting local comparative advantages, such as cheaper workforce, more abundant natural resources, or specific technological knowledge. As a result, such resources can tremendously contribute to innovation because they provide the company with access to possible new combinations in terms of resources and markets.

Together with funding innovation driver, values explain 10.5% of variations in number of employees abroad. Establishing and disseminating values that set innovation as a priority seem to partially explain the number of employees abroad. It may happen due to the fact that a more innovative company may seek for learning more both about specific local knowledge—which can pitch in development of new products, services, or processes—and about the market—which can provide the company with insights on how to adapt or completely redesign current products, services, or processes to that and similar market. As a consequence, the company has to hire locals or, what is pretty common practice, expatriate people from the home country.

To put all in a nutshell, two innovation drivers sound to better explain internationalization outputs: (1) funding and (2) diffusion. Other two innovation drivers contribute to explain variations in two internationalization outputs: (3) open communication and (4) structure. Nevertheless, the contribution is negative, which means that structure inhibits a company to internationalize. Finally, other three innovation drivers have only a minor contribution in terms of explanation of the variation in specific internationalization output variables: (5) workplace environment, (6) strategy, and (7) values.

Tables 63 and 64, next, unveil a summary of explained outputs, descriptors, R^2, and managerial recommendation for companies expecting to increase the presented outputs. Nevertheless, a special caution is necessary while reading the suggested managerial recommendations because the power of explanation of all models are low, which means the input set of variables hold only a minor explanation of the variation in output variables.

Table 63 – A summary of innovation drivers describing internationalization

Explained output	**Descriptors input (coefficients in parenthesis)**	**R^2**	**Managerial recommendation**
income from abroad	funding (.325)	5.2%	Whenever a company expects to increase income from abroad, the recommendation is to increase amount of financial resources directed to innovation. Moreover, it ought to develop a workplace with excellent levels of organizational climate, both locally and globally.
income from abroad	funding (.282), workplace environment (.235)	7.3%	
number of host countries	funding (.312)	5.6%	Whenever a company expects to increase the number of host countries in which it operates, the recommendation is to increase the amount of financial resources directed to innovation. Moreover, it ought to master the process of successfully launching products, services, or processes into the market. Promoting open communication between people inside and outside the company also seems to foster the number of host countries. Finally, unpredictably, establishing a less hierarchical organizational structure with clear definition of roles seems to diminish the number of host countries.
number of host countries	funding (.247), diffusion (.228)	8.2%	
number of host countries	funding (.227), diffusion (.172), open communication (.153)	9.3%	
number of host countries	funding (.235), diffusion (.194), open communication (.236), structure (-.184)	10.7%	
number of employees abroad	funding (.423)	8.0%	Whenever a company expects to increase the number of employees abroad, the recommendation is to increase the amount of financial resources directed to innovation. Moreover, establishing and disseminating values that set innovation as a priority seem to increase the number of employees abroad.
number of employees abroad	funding (.345), values (.262)	10.5%	

Table 64 – A summary of innovation drivers describing internationalization (cont.)

Explained output	Descriptors input (coefficients in parenthesis)	R^2	Managerial recommendation
internationalization maturity	funding (.355)	7.0%	Whenever a company expects to increase internationalization maturity, the recommendation is to increase the amount of financial resources directed to innovation. Moreover, it ought to master the process of successfully launching products, services, or processes into the market. Promoting open communication between people inside and outside the company also seems to foster internationalization maturity. Finally, unpredictably, establishing a less hierarchical organizational structure with clear definition of roles seems to diminish the internationalization maturity.
internationalization maturity	funding (.290), diffusion (.229)	9.5%	
internationalization maturity	funding (.270), diffusion (.175), open communication (.145)	10.5%	
internationalization maturity	funding (.278), diffusion (.196), open communication (.222), structure (-.171)	11.7%	
psychic difference	funding (.333)	5.3%	Whenever a company expects to increase psychic difference of host countries, the recommendation is to increase the amount of financial resources directed to innovation. Moreover, it ought to master the process of successfully launching products, services, or processes into the market.
psychic difference	funding (.264), diffusion (.237)	7.6%	
internationalization commitment	funding (.330)	6.8%	Whenever a company expects to increase internationalization commitment, the recommendation is to increase the amount of financial resources directed to innovation. Moreover, it ought to establish and disseminate a clear strategy that sets innovation as a priority.
internationalization commitment	funding (.260), strategy (.206)	9.0%	
internationalization degree	funding (.349)	7.8%	Whenever a company expects to increase internationalization degree, the recommendation is to increase the amount of financial resources directed to innovation. Moreover, it ought to master the process of successfully launching products, services, or processes into the market.
internationalization degree	funding (.285), diffusion (.224)	10.6%	

Therefore, hypothesis 5—innovation would have positive effects on internationalization—was partially accepted: although the direction of relation is positive, the power of explanation is low.

4.6 Describing the relations between innovation capability and internationalization degree

The sixth hypothesis of this study is described as follows. This hypothesis was tested through the use of the statistical technique of simple linear regression:

Hypothesis 6 (conceptual level)

Innovation capability would have positive effects on internationalization.

Hypothesis 6 (empirical level)

The construct of innovation capability would explain positively the internationalization degree.

Coopers and Schindler (2008) posit when values of one variable are used to estimate the corresponding values of another variable, a single linear regression is suitable. In the case of this study, the input variable is the innovation capability, whose detailed calculations were presented previously. Innovation capability is within a 1-7 scale. The output variables are those internationalization indicators, say: (1) income from abroad, (2) number of host countries, (3) number of employees abroad, (4) internationalization maturity, (5) psychic difference of host countries, (6) internationalization commitment, and (7) internationalization degree. As previously defined, internationalization degree is defined as a composite single mean of all other six internationalization output values. All seven output variables are within a 1-7 scale as well. The applied regression method is 'stepwise'.

4.6.1 Identifying the association of innovation capability and internationalization degree

A scatterplot is used to visually inspect a bivariate relation between variables. Coopers and Schindler (2008) emphasize scatterplots are essential to understand the relation between variables as they provide the direction, shape, and magnitude of this relation. Figure 51, next, shows the scatterplot of innovation capability and internationalization degree.

The visual inspection leads to the understanding that the relation between innovation capability and internationalization degree is weak. Coopers and Schindler (2008) define weak relations as those with correlation less than .40 and those cases show overall scattered dots—and such dots stray far from an imaginary straight line that passes through the average set of dots. In this particular experiment, innovation capability and internationalization degree show a correlation of .26 and the scatterplot shows a very disperse cloud of dots with no apparent relation and with several cases lying on internalization degree of 1—which denotes no internationalization or very low levels of internationalization. Furthermore, it seems that even eliminating those cases of internationalization degree of 1 the weak relation seems not to start presenting a relevant modification.

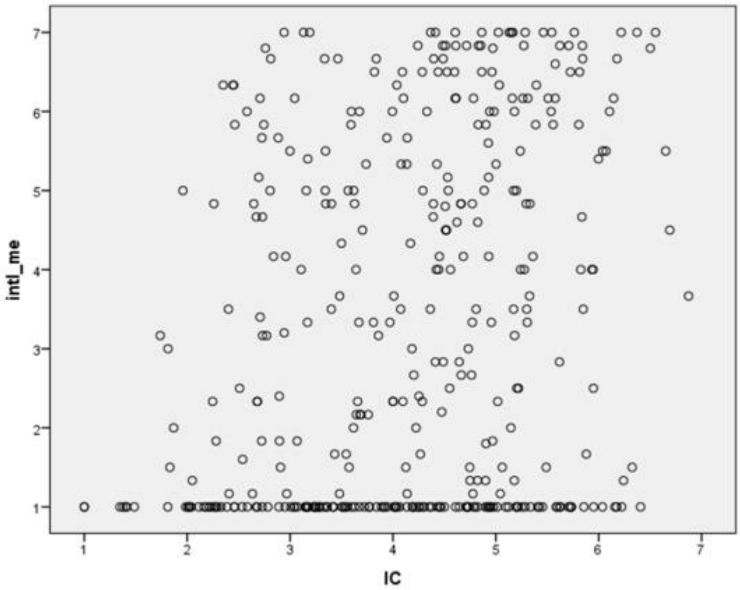

Figure 51 – Scatterplot of innovation capability and internationalization degree

4.6.2 Innovation capability as predictor of *income from abroad*

This statistical test estimates income from abroad as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 52, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,209[a]	,044	,041	2,520

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110,400	1	110,400	17,379	,000[b]
	Residual	2413,966	380	6,353		
	Total	2524,366	381			

a. Dependent Variable: intl_01

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,295	,461		2,806	,005
	IC	,445	,107	,209	4,169	,000

a. Dependent Variable: intl_01

Figure 52 – Innovation capability describing income from abroad

Model 1 reflects income from abroad being explained by innovation capability:

$$income\ from\ abroad = 1.295 +\ .445 * (innovation\ capability)$$

Model 1 is significant at .01 and explains 4.4% of the variation in income from abroad.

4.6.3 Innovation capability as predictor of *number of host countries*

This statistical test estimates number of host countries as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 53, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,229[a]	,052	,050	2,310

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	113,354	1	113,354	21,244	,000[b]
	Residual	2048,978	384	5,336		
	Total	2162,332	385			

a. Dependent Variable: intl_02

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,433	,421		3,405	,001
	IC	,449	,097	,229	4,609	,000

a. Dependent Variable: intl_02

Figure 53 – Innovation capability describing number of host countries

Model 1 reflects number of host countries being explained by innovation capability:

$$number\ of\ host\ countries = 1.433 +\ .449 * (innovation\ capability)$$

Model 1 is significant at .01 and explains 5.2% of the variation in number of host countries.

4.6.4 Innovation capability as predictor of *number of employees abroad*

This statistical test estimates number of employees abroad as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 54, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,236[a]	,056	,053	2,619

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	155,889	1	155,889	22,720	,000[b]
	Residual	2634,785	384	6,861		
	Total	2790,674	385			

a. Dependent Variable: intl_03

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,971	,477		2,036	,042
	IC	,527	,110	,236	4,767	,000

a. Dependent Variable: intl_03

Figure 54 – Innovation capability describing number of employees abroad

Model 1 reflects number of employees abroad being explained by innovation capability:

$$number\ of\ employees\ abroad = .971 +\ .527 * (innovation\ capability)$$

Model 1 is significant at .01 and explains 5.6% of the variation in number of employees abroad.

4.6.5 Innovation capability as predictor of *internationalization maturity*

This statistical test estimates internationalization maturity as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 55, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,258[a]	,066	,064	2,324

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	147,002	1	147,002	27,214	,000[b]
	Residual	2068,832	383	5,402		
	Total	2215,834	384			

a. Dependent Variable: intl_04

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,170	,424		2,758	,006
	IC	,512	,098	,258	5,217	,000

a. Dependent Variable: intl_04

Figure 55 – Innovation capability describing internationalization maturity

Model 1 reflects internationalization maturity being explained by innovation capability:

$$internationalization\ maturity = 1.170 + \ .512 * (innovation\ capability)$$

Model 1 is significant at .01 and explains 6.6% of the variation in internationalization maturity.

4.6.6 Innovation capability as predictor of *psychic difference of host countries*

This statistical test estimates psychic difference of host countries as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 56, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,222[a]	,049	,047	2,535

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	124,488	1	124,488	19,373	,000[b]
	Residual	2403,331	374	6,426		
	Total	2527,819	375			

a. Dependent Variable: intl_05

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,743	,465		3,748	,000
	IC	,474	,108	,222	4,401	,000

a. Dependent Variable: intl_05

Figure 56 – Innovation capability describing psychic difference

Model 1 reflects psychic difference of host countries being explained by innovation capability:

$$psychic\ difference = 1.743 + \ .474 * (innovation\ capability)$$

Model 1 is significant at .01 and explains 4.9% of the variation in psychic difference of host countries.

4.6.7 Innovation capability as predictor of *internationalization commitment*

This statistical test estimates internationalization commitment as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 57, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,237[a]	,056	,053	2,209

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	106,826	1	106,826	21,901	,000[b]
	Residual	1799,885	369	4,878		
	Total	1906,712	370			

a. Dependent Variable: intl_06

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1,295	,411		3,156	,002
	IC	,444	,095	,237	4,680	,000

a. Dependent Variable: intl_06

Figure 57 – Innovation capability describing internationalization commitment

Model 1 reflects internationalization commitment being explained by innovation capability:

$$internationalization\ commitment = 1.295 + \ .444 * (innovation\ capability)$$

Model 1 is significant at .01 and explains 5.6% of the variation in internationalization commitment.

4.6.8 Innovation capability as predictor of *internationalization degree*

This statistical test estimates internationalization degree as a function of innovation capability. Both input and output variables are within a 1-7 scale.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,260[a]	,068	,065	2,1645185

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	130,362	1	130,362	27,825	,000[b]
	Residual	1799,094	384	4,685		
	Total	1929,456	385			

a. Dependent Variable: intl_me

b. Predictors: (Constant), IC

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1,295	,394		3,284	,001
	IC	,481	,091	,260	5,275	,000

Coefficients[a]

a. Dependent Variable: intl_me

Figure 58 – Innovation capability describing internationalization degree

The main output numbers of the multiple regression analysis are exhibited in previous Figure 58.

Model 1 reflects internationalization degree being explained by innovation capability:

$$internationalization\ degree = 1.295 + .481 * (innovation\ capability)$$

Model 1 is significant at .01 and explains 6.8% of the variation in internationalization degree.

4.6.9 Analyzing main findings

Table 65, as follows, displays a summary of explained outputs, descriptors, R^2, and a general managerial recommendation for companies expecting to increase the presented outputs. Again, a special caution is necessary while reading the suggested managerial recommendations because the power of explanation of all models is low, which means the input set of variables hold only a minor explanation of the variation in output variables.

Table 65 – A summary of innovation capability describing internationalization

Explained output	Descriptors input (coefficients in parenthesis)	R^2	Managerial recommendation
income from abroad	innovation capability (.445)	4.4%	Innovation capability alone is not a good descriptor for all internationalization outputs, as it explains no more than approximately 7% in the best case. Therefore, a company expecting to enhance internationalization outputs should seek for other input variables.
number of host countries	innovation capability (.449)	5.2%	
number of employees abroad	innovation capability (.527)	5.6%	
internationalization maturity	innovation capability (.512)	6.6%	
psychic difference	innovation capability (.474)	4.9%	
internationalization commitment	innovation capability (.444)	5.6%	
internationalization degree	innovation capability (.481)	6.8%	

As presented in Table 65, innovation capability alone is not a good descriptor for internationalization outputs. In this sense, innovation in general terms seems not to further explain variations in internationalization. Table 66, next, compares the results from regression outputs considering the explication power of the best models when, first, innovation drivers are run against internationalization output variables, and then, innovation capability is run against these same output variables.

Table 66 – A summary of innovation drivers and innovation capability describing internationalization

R^2	intl_01	intl_02	intl_03	intl_04	intl_05	intl_06	intl_me
innovation drivers	7.3%	10.7%	10.5%	11.7%	7.6%	9.0%	10.6%
innovation capability	4.4%	5.2%	5.6%	6.6%	4.9%	5.6%	6.8%

In all cases, a joint effect of two, three, or four innovation drivers results in better power of explanation of internationalization output variables when compared to innovation capability alone. Thus, when a company expects to enhance increase internationalization outputs, it ought to consider acting primarily over just a specific set of innovation drivers instead of acting over all innovation drivers that compose the innovation capability.

As a result, a company expecting to enhance internationalization outputs may seek for other input variables. Such variables may come from the literature on international entrepreneurship or internationalization entry modes—which include internationalization capabilities.

Retrieving concepts from the literature review, Rialp. (2005) divide factors that seem to foster internationalization into two groups: internal factors and external factors. Internal factors that enhances internationalization include: (1) global vision of managers since the establishment of the firm, (2) previous experience of managers on internationalization, (3) commitment of management to international operations, (4) international personal and business-oriented relationships and networks, (5) level of international management market knowledge and commitment, (6) availability of intangible assets based on managerial knowledge, (7) value creation through product differentiation, technological leadership, innovation, and quality, (8) development of proactive internationalization strategy focused on market niches spread throughout worldwide, (9) customer orientation and relationship, and (10) flexibility for quick adaptation to changes of the external environment. Furthermore, external factors include: (1) industry in which the firm operates—whether more favorable to internationalization or not—, (2) the specificities of the geographic context markets, (3) market conditions among sectors of economic activities, and (4) technological advancements in operational aspects of production, transportation, and communication.

Likewise, Keupp and Grassmann (2009) highlight nine general factors that may expand internationalization entrepreneurship initiatives: (1) personal features of managers—whether they possess good socio-cognitive skills and knowledge on demographics—, (2) firm features—to which extent R&D is intense, international experience already took place, market share and size is favorable to internationalization, firm ownership is favorable to internationalization, and advertising is intense—, (3) industry features—how foreign and domestic industry structure, government policy, and industry competition are favorable to internationalization—, (4) host country features—how distant are host countries in terms of culture, language, legislation, taxation, etc.—, (5) firm strategy features—to which extent product-market strategy, planning, competitive strategy and orientation inhibit or support internationalization—, (6) competitive advantages features—how mature is the company regarding issues like comparative advantage, intellectual property, innovative capabilities—, (7) resources and capabilities features—to which extent is the company's access to resource stock, technologies, factor endowments, and organizational capabilities—, (8) organizational learning features—how good is the company in terms of learning capabilities, technological learning, knowledge growth, and integration—, (9) networking features—how good is the company in terms of use of collaborative agreements, establishment of interfirm networks, and spillovers.

These suggestions from Rialp (2005) and Keupp and Grassmann (2009) encompass a comprehensive list of variables that may be regarded in future and complementary studies aiming at depicting variables that better or more completely describe variations in internationalization outputs.

Therefore, hypothesis 6—innovation capability would have positive effects on internationalization—was partially accepted: although the direction of relation is positive, the power of explanation is low.

4.7 Describing the relations between innovation drivers and business performance

The seventh hypothesis of this study is described as follows. This hypothesis was tested through the use of the statistical technique of multiple linear regression:

Hypothesis 7 (conceptual level)

Innovation would have positive effects on business performance.

Hypothesis 7 (empirical level)

The practice of innovation drivers would explain positively the business performance.

Description of collected data, detection and handle of missing data are no longer necessary for the purposes of describing the relations between innovation drivers and business performance because the input variables were subject to those analyzes in items 4.3.1 and 4.3.2.

4.7.1 Detecting and handling multivariate outliers

The same procedures described in item 4.5.1 were followed.

4.7.2 Performing multivariate normality tests

Although it is important to understand how the distribution departs from normality in terms of shape and whether these values are large enough to warrant attention, the researcher must also consider the effects of sample size. For samples sizes of 200 or more, the impacts of non-normality on results may be negligible as the detrimental effects can even be canceled out. Therefore, in most instances, as the sample sizes become large, the researcher can be less concerned about non-normal variable (Hair et al., 2006). For the purposes of this study, the sample size ($n > 300$) surpasses the threshold of 200.

This procedure was adopted for this study because it would otherwise hamper the use of the dependence technique of multiple regression analysis.

4.7.3 Identifying innovation drivers as predictors of the business performance

In order to describe the relations between innovation drivers—input variables—and internationalization outputs, the statistical technique of multiple linear regression is recommended and therefore employed. Coopers and Schindler (2008) stress the use of multiple regression technique as a descriptive tool to develop an equation for estimating an output variable considering several input variables. In the case of this study, input variables include all 21 innovation drivers and output variable varies depending on the estimation being tested. All 21 input variables are within a 1-7 scale. Nine tests are performed, in this order: 21 innovation drivers explaining (1) sales performance, (2) innovation performance, (3) sales growth, (4) quality, (5) cost advantage, (6) market competitiveness, (7) uniqueness, (8) concept-to-launch time, and (9) business performance. As previously defined, business performance is defined as a composite single mean of all other eight business performance output values. All nine output variables are within a 1-7 scale as well. The applied regression method is 'stepwise'.

4.7.3.1 Innovation drivers as predictors of *sales performance*

This statistical test estimates sales performance as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 59, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,341[a]	,116	,114	2,042
2	,380[b]	,144	,140	2,012
3	,394[c]	,155	,149	2,002
4	,407[d]	,165	,157	1,992

a. Predictors: (Constant), prct_09

b. Predictors: (Constant), prct_09, prct_02

c. Predictors: (Constant), prct_09, prct_02, prct_10

d. Predictors: (Constant), prct_09, prct_02, prct_10, prct_15

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	206,325	1	206,325	49,463	,000[b]
	Residual	1572,572	377	4,171		
	Total	1778,897	378			
2	Regression	256,847	2	128,423	31,725	,000[c]
	Residual	1522,051	376	4,048		
	Total	1778,897	378			
3	Regression	276,221	3	92,074	22,977	,000[d]
	Residual	1502,676	375	4,007		
	Total	1778,897	378			
4	Regression	294,326	4	73,582	18,537	,000[e]
	Residual	1484,571	374	3,969		
	Total	1778,897	378			

a. Dependent Variable: perf_01
b. Predictors: (Constant), prct_09
c. Predictors: (Constant), prct_09, prct_02
d. Predictors: (Constant), prct_09, prct_02, prct_10
e. Predictors: (Constant), prct_09, prct_02, prct_10, prct_15

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,612	,298		5,416	,000
	prct_09	,424	,060	,341	7,033	,000
2	(Constant)	1,004	,340		2,953	,003
	prct_09	,325	,066	,261	4,940	,000
	prct_02	,246	,070	,186	3,533	,000
3	(Constant)	,871	,344		2,535	,012
	prct_09	,258	,072	,207	3,567	,000
	prct_02	,200	,072	,151	2,756	,006
	prct_10	,165	,075	,129	2,199	,028
4	(Constant)	1,034	,350		2,952	,003
	prct_09	,271	,072	,218	3,760	,000
	prct_02	,219	,073	,166	3,016	,003
	prct_10	,207	,077	,162	2,678	,008
	prct_15	-,135	,063	-,112	-2,136	,033

a. Dependent Variable: perf_01

Figure 59 – Innovation drivers describing sales performance

Model 1 reflects sales performance being explained by diffusion innovation driver alone:

$$sales\ performance = 1.612 + .424 * (diffusion)$$

Model 2 reflects sales performance being explained by the joint effect of diffusion and technologies innovation drivers:

$$sales\ performance = 1.004 + .325 * (diffusion) + .246 * (technologies)$$

Model 3 reflects sales performance being explained by the joint effect of diffusion, technologies, and values innovation drivers:

$$sales\ performance = .871 + .258 * (diffusion) + .200 * (technologies) + .165 * (values)$$

Model 4 reflects sales performance being explained by the joint effect of diffusion, technologies, values, and structure innovation drivers:

$$sales\ performance = 1.034 + .271 * (diffusion) + .219 * (technologies) + .207 * (values) - .135 * (structure)$$

Table 67, next, provides a summary of descriptors, significance level, and power of explanation of models explaining sales performance.

Table 67 – A summary of innovation drivers describing sales performance

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	diffusion	.01	11.6%
2	diffusion, technologies	.05	14.4%
3	diffusion, technologies, values	.05	15.5%
4	diffusion, technologies, values, structure	.05	16.5%

4.7.3.2 Innovation drivers as predictors of *innovation performance*

This statistical test estimates innovation performance as a function of innovation drivers. Both input and output variables are within a 1-7 scale.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,366[a]	,134	,132	1,923
2	,410[b]	,168	,163	1,888
3	,422[c]	,178	,171	1,879
4	,438[d]	,192	,183	1,865

a. Predictors: (Constant), prct_10

b. Predictors: (Constant), prct_10, prct_09

c. Predictors: (Constant), prct_10, prct_09, prct_05

d. Predictors: (Constant), prct_10, prct_09, prct_05, prct_02

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	214,516	1	214,516	57,998	,000[b]
	Residual	1387,012	375	3,699		
	Total	1601,528	376			
2	Regression	268,837	2	134,419	37,723	,000[c]
	Residual	1332,690	374	3,563		
	Total	1601,528	376			
3	Regression	284,765	3	94,922	26,888	,000[d]
	Residual	1316,763	373	3,530		
	Total	1601,528	376			
4	Regression	307,373	4	76,843	22,088	,000[e]
	Residual	1294,155	372	3,479		
	Total	1601,528	376			

a. Dependent Variable: perf_02

b. Predictors: (Constant), prct_10

c. Predictors: (Constant), prct_10, prct_09

d. Predictors: (Constant), prct_10, prct_09, prct_05

e. Predictors: (Constant), prct_10, prct_09, prct_05, prct_02

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1,563	,249		6,278	,000
	prct_10	,446	,059	,366	7,616	,000
2	(Constant)	,928	,293		3,163	,002
	prct_10	,304	,068	,250	4,471	,000
	prct_09	,258	,066	,218	3,904	,000
3	(Constant)	1,241	,327		3,794	,000
	prct_10	,356	,072	,292	4,946	,000
	prct_09	,281	,067	,238	4,220	,000
	prct_05	-,144	,068	-,114	-2,124	,034
4	(Constant)	,995	,339		2,937	,004
	prct_10	,320	,073	,263	4,402	,000
	prct_09	,246	,068	,208	3,637	,000
	prct_05	-,198	,071	-,157	-2,810	,005
	prct_02	,181	,071	,144	2,549	,011

Coefficients[a]

a. Dependent Variable: perf_02

Figure 60 – Innovation drivers describing innovation performance

The main output numbers of the multiple regression analysis are exhibited in previous Figure 60.

Model 1 reflects innovation performance being explained by values innovation driver alone:

$$innovation\ performance = 1.563 + .446 * (values)$$

Model 2 reflects innovation performance being explained by the joint effect of values and diffusion innovation drivers:

$$innovation\ performance = .928 + .304 * (values) + .258\ (diffusion)$$

Model 3 reflects innovation performance being explained by the joint effect of values, diffusion, and intellectual capital innovation drivers:

$$innovation\ performance = 1.241 + .356 * (values) + .281 * (diffusion) - .144 * (intellectual\ capital)$$

Model 4 reflects innovation performance being explained by the joint effect of values, diffusion, intellectual capital, and technologies innovation drivers:

$$innovation\ performance = .995 + .320 * (values) + .246 * (diffusion) - .198 * (intellectual\ capital) + .181 * (technologies)$$

Table 68, next, provides a summary of descriptors, significance level, and power of explanation of models explaining innovation performance.

Table 68 – A summary of innovation drivers describing innovation performance

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	values	.01	13.4%
2	values, diffusion	.01	16.8%
3	values, diffusion, intellectual capital	.05	17.8%
4	values, diffusion, intellectual capital, technologies	.05	19.2%

4.7.3.3 Innovation drivers as predictors of *sales growth*

This statistical test estimates sales growth as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 61, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,335[a]	,112	,110	1,819
2	,356[b]	,127	,122	1,806

a. Predictors: (Constant), prct_09

b. Predictors: (Constant), prct_09, prct_04

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	158,487	1	158,487	47,902	,000[b]
	Residual	1257,243	380	3,309		
	Total	1415,730	381			
2	Regression	179,501	2	89,751	27,515	,000[c]
	Residual	1236,229	379	3,262		
	Total	1415,730	381			

a. Dependent Variable: perf_03

b. Predictors: (Constant), prct_09

c. Predictors: (Constant), prct_09, prct_04

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,716	,265		6,477	,000
	prct_09	,372	,054	,335	6,921	,000
2	(Constant)	1,460	,282		5,186	,000
	prct_09	,317	,058	,285	5,495	,000
	prct_04	,149	,059	,132	2,538	,012

a. Dependent Variable: perf_03

Figure 61 – Innovation drivers describing sales growth

Model 1 reflects sales growth being explained by diffusion innovation driver alone:

$$sales\ growth = 1.716 + .372 * (diffusion)$$

Model 2 reflects sales growth being explained by the joint effect of diffusion and time innovation drivers:

$$sales\ growth = 1.460 + .317 * (diffusion) + .149 * (time)$$

Table 69 provides a summary of descriptors, significance level, and power of explanation of models explaining sales growth.

Table 69 – A summary of innovation drivers describing sales growth

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	diffusion	.01	11.2%
2	diffusion, time	.05	12.7%

4.7.3.4 Innovation drivers as predictors of *quality*

This statistical test estimates quality of products, services, or processes as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 62, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,445[a]	,198	,196	1,285
2	,467[b]	,218	,214	1,271
3	,480[c]	,230	,224	1,263

a. Predictors: (Constant), prct_09

b. Predictors: (Constant), prct_09, prct_02

c. Predictors: (Constant), prct_09, prct_02, prct_17

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	155,456	1	155,456	94,077	,000[b]
	Residual	629,578	381	1,652		
	Total	785,034	382			
2	Regression	171,288	2	85,644	53,026	,000[c]
	Residual	613,746	380	1,615		
	Total	785,034	382			
3	Regression	180,898	3	60,299	37,828	,000[d]
	Residual	604,135	379	1,594		
	Total	785,034	382			

a. Dependent Variable: perf_04

b. Predictors: (Constant), prct_09

c. Predictors: (Constant), prct_09, prct_02

d. Predictors: (Constant), prct_09, prct_02, prct_17

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,689	,187		19,713	,000
	prct_09	,368	,038	,445	9,699	,000
2	(Constant)	3,349	,215		15,609	,000
	prct_09	,313	,042	,378	7,532	,000
	prct_02	,137	,044	,157	3,131	,002
3	(Constant)	3,121	,233		13,417	,000
	prct_09	,285	,043	,344	6,666	,000
	prct_02	,112	,045	,128	2,494	,013
	prct_17	,109	,044	,123	2,455	,015

a. Dependent Variable: perf_04

Figure 62 – Innovation drivers describing quality

Model 1 reflects quality of products, services, or processes being explained by diffusion innovation driver alone:

$$quality = 3.689 + .368 * (diffusion)$$

Model 2 reflects quality of products, services, or processes being explained by the joint effect of diffusion and technologies innovation drivers:

$$quality = 3.349 + .313 * (diffusion) + .137 * (technologies)$$

Model 3 reflects quality of products, services, or processes being explained by the joint effect of diffusion, technologies, and workplace environment innovation drivers:

$$quality = 3.121 + .285 * (diffusion) + .112 * (technologies) + .109 * (workplace\ environment)$$

Table 70 – A summary of innovation drivers describing quality

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	diffusion	.01	19.8%
2	diffusion, technologies	.01	21.8%
3	diffusion, technologies, workplace environment	.05	23.0%

Previous Table 70 provides a summary of descriptors, significance level, and power of explanation of models explaining quality of products, services, or processes.

4.7.3.5 Innovation drivers as predictors of *cost*

This statistical test estimates cost advantage as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 63, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,287[a]	,082	,080	1,523
2	,336[b]	,113	,108	1,499
3	,353[c]	,125	,118	1,491

a. Predictors: (Constant), prct_12

b. Predictors: (Constant), prct_12, prct_18

c. Predictors: (Constant), prct_12, prct_18, prct_05

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79,151	1	79,151	34,140	,000[b]
	Residual	880,995	380	2,318		
	Total	960,147	381			
2	Regression	108,561	2	54,280	24,158	,000[c]
	Residual	851,586	379	2,247		
	Total	960,147	381			
3	Regression	119,979	3	39,993	17,993	,000[d]
	Residual	840,167	378	2,223		
	Total	960,147	381			

a. Dependent Variable: perf_05

b. Predictors: (Constant), prct_12

c. Predictors: (Constant), prct_12, prct_18

d. Predictors: (Constant), prct_12, prct_18, prct_05

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,650	,186		19,593	,000
	prct_12	,251	,043	,287	5,843	,000
2	(Constant)	3,168	,227		13,973	,000
	prct_12	,175	,047	,200	3,710	,000
	prct_18	,188	,052	,195	3,618	,000
3	(Constant)	2,903	,254		11,431	,000
	prct_12	,133	,051	,152	2,641	,009
	prct_18	,164	,053	,171	3,124	,002
	prct_05	,122	,054	,126	2,267	,024

a. Dependent Variable: perf_05

Figure 63 – Innovation drivers describing cost advantage

Model 1 reflects cost advantage being explained by leadership innovation driver alone:

$$cost = 3.650 + .251 * (leadership)$$

Model 2 reflects cost advantage being explained by the joint effect of leadership and portfolio management innovation drivers:

$$cost = 3.168 + .175 * (leadership) + .188 * (portfolio\ management)$$

Model 3 reflects cost advantage being explained by the joint effect of leadership, portfolio management, and intellectual capital innovation drivers:

$$cost = 2.903 + .133 * (leadership) + .164 * (portfolio\ management) + .122 * (intellectual\ capital)$$

Table 71 – A summary of innovation drivers describing cost advantage

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	leadership	.01	8.2%
2	leadership, portfolio management	.01	11.3%
3	leadership, portfolio management, intellectual capital	.05	12.5%

Previous Table 71 provides a summary of descriptors, significance level, and power of explanation of models explaining cost advantage.

4.7.3.6 Innovation drivers as predictors of *competitiveness*

This statistical test estimates market competitiveness as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 64, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,427[a]	,182	,180	1,260
2	,470[b]	,221	,217	1,232
3	,482[c]	,233	,226	1,224

a. Predictors: (Constant), prct_09
b. Predictors: (Constant), prct_09, prct_21
c. Predictors: (Constant), prct_09, prct_21, prct_18

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	134,772	1	134,772	84,851	,000[b]
	Residual	605,155	381	1,588		
	Total	739,927	382			
2	Regression	163,246	2	81,623	53,785	,000[c]
	Residual	576,681	380	1,518		
	Total	739,927	382			
3	Regression	172,051	3	57,350	38,276	,000[d]
	Residual	567,876	379	1,498		
	Total	739,927	382			

a. Dependent Variable: perf_06
b. Predictors: (Constant), prct_09
c. Predictors: (Constant), prct_09, prct_21
d. Predictors: (Constant), prct_09, prct_21, prct_18

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,595	,183		19,593	,000
	prct_09	,343	,037	,427	9,211	,000
2	(Constant)	3,178	,204		15,618	,000
	prct_09	,265	,041	,330	6,538	,000
	prct_21	,174	,040	,219	4,332	,000
3	(Constant)	3,051	,209		14,605	,000
	prct_09	,231	,043	,288	5,417	,000
	prct_21	,131	,044	,165	2,997	,003
	prct_18	,115	,047	,137	2,424	,016

a. Dependent Variable: perf_06

Figure 64 – Innovation drivers describing market competitiveness

Model 1 reflects market competitiveness being explained by leadership innovation driver alone:

$$competitiveness = 3.595 + .343 * (diffusion)$$

Model 2 reflects market competitiveness being explained by the joint effect of diffusion and strategic alliances innovation drivers:

$$competitiveness = 3.178 + .265 * (leadership) + .174 * (portfolio\ management)$$

Model 3 reflects cost advantage being explained by the joint effect of diffusion, strategic alliances, and portfolio management innovation drivers:

$$competitiveness = 3.051 + .231 * (diffusion) + .131 * (strategic\ alliances) + .115 * (portfolio\ management)$$

Table 72 provides a summary of descriptors, significance level, and power of explanation of models explaining market competitiveness.

Table 72 – A summary of innovation drivers describing market competitiveness

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	diffusion	.01	18.2%
2	diffusion, strategic alliances	.01	22.1%
3	diffusion, strategic alliances, portfolio management	.05	23.3%

4.7.3.7 Innovation drivers as predictors of *uniqueness*

This statistical test estimates uniqueness of products, services, or processes as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 65, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,404[a]	,163	,161	1,543
2	,449[b]	,201	,197	1,509
3	,475[c]	,226	,220	1,488
4	,491[d]	,241	,233	1,476

a. Predictors: (Constant), prct_10
b. Predictors: (Constant), prct_10, prct_20
c. Predictors: (Constant), prct_10, prct_20, prct_02
d. Predictors: (Constant), prct_10, prct_20, prct_02, prct_13

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	176,268	1	176,268	74,036	,000[b]
	Residual	904,726	380	2,381		
	Total	1080,995	381			
2	Regression	217,529	2	108,765	47,740	,000[c]
	Residual	863,466	379	2,278		
	Total	1080,995	381			
3	Regression	244,233	3	81,411	36,777	,000[d]
	Residual	836,762	378	2,214		
	Total	1080,995	381			
4	Regression	260,174	4	65,044	29,874	,000[e]
	Residual	820,820	377	2,177		
	Total	1080,995	381			

a. Dependent Variable: perf_07
b. Predictors: (Constant), prct_10
c. Predictors: (Constant), prct_10, prct_20
d. Predictors: (Constant), prct_10, prct_20, prct_02
e. Predictors: (Constant), prct_10, prct_20, prct_02, prct_13

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2,780	,199		13,979	,000
	prct_10	,402	,047	,404	8,604	,000
2	(Constant)	2,297	,225		10,193	,000
	prct_10	,311	,050	,313	6,179	,000
	prct_20	,206	,048	,215	4,256	,000
3	(Constant)	1,895	,250		7,570	,000
	prct_10	,246	,053	,247	4,630	,000
	prct_20	,170	,049	,178	3,474	,001
	prct_02	,185	,053	,180	3,473	,001
4	(Constant)	1,616	,269		6,012	,000
	prct_10	,207	,055	,208	3,788	,000
	prct_20	,162	,049	,169	3,334	,001
	prct_02	,165	,053	,161	3,087	,002
	prct_13	,125	,046	,134	2,706	,007

Figure 65 – Innovation drivers describing uniqueness

Model 1 reflects uniqueness of products, services, or processes being explained by values innovation driver alone:

$$uniqueness = 2.780 + .402 * (values)$$

Model 2 reflects uniqueness of products, services, or processes being explained by the joint effect of values and institutions innovation drivers:

$$uniqueness = 2.297 + .311 * (values) + .206 * (institutions)$$

Model 3 reflects uniqueness of products, services, or processes being explained by the joint effect of values, institutions, and technologies innovation drivers:

$$uniqueness = 1.895 + .246 * (values) + .170 * (institutions) + .185 * (technologies)$$

Model 4 reflects uniqueness of products, services, or processes being explained by the joint effect of values, institutions, technologies, and open communication innovation drivers:

$$uniqueness = 1.616 + .207 * (values) + .162 * (institutions) + .165 * (technologies) + .125 * (open\ communication)$$

Table 73 – A summary of innovation drivers describing uniqueness

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	values	.01	16.3%
2	values, institutions	.01	20.1%
3	values, institutions, technologies	.01	22.6%
4	values, institutions, technologies, open communication	.01	24.1%

Previous Table 73 provides a summary of descriptors, significance level, and power of explanation of models explaining uniqueness of products, services, or processes.

4.7.3.8 Innovation drivers as predictors of *concept-to-launch time*

This statistical test estimates concept-to-launch time as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 66, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,441[a]	,195	,192	1,486
2	,472[b]	,223	,219	1,461
3	,486[c]	,236	,230	1,451

a. Predictors: (Constant), prct_09
b. Predictors: (Constant), prct_09, prct_02
c. Predictors: (Constant), prct_09, prct_02, prct_10

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	201,664	1	201,664	91,339	,000[b]
	Residual	834,576	378	2,208		
	Total	1036,239	379			
2	Regression	231,175	2	115,588	54,128	,000[c]
	Residual	805,064	377	2,135		
	Total	1036,239	379			
3	Regression	244,853	3	81,618	38,778	,000[d]
	Residual	791,386	376	2,105		
	Total	1036,239	379			

a. Dependent Variable: perf_08
b. Predictors: (Constant), prct_09
c. Predictors: (Constant), prct_09, prct_02
d. Predictors: (Constant), prct_09, prct_02, prct_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,288	,220		10,420	,000
	prct_09	,424	,044	,441	9,557	,000
2	(Constant)	1,839	,247		7,434	,000
	prct_09	,343	,049	,357	7,033	,000
	prct_02	,190	,051	,189	3,718	,000
3	(Constant)	1,730	,249		6,941	,000
	prct_09	,286	,053	,297	5,351	,000
	prct_02	,150	,053	,149	2,827	,005
	prct_10	,140	,055	,143	2,549	,011

a. Dependent Variable: perf_08

Figure 66 – Innovation drivers describing concept-to-launch time

Model 1 reflects concept-to-launch time being explained by diffusion innovation driver alone:

$$concept\_to\_launch\ time = 2.288 + .424 * (diffusion)$$

Model 2 reflects concept-to-launch time being explained by the joint effect of diffusion and technologies innovation drivers:

$$concept\_to\_launch\ time = 1.839 + .343 * (diffusion) + .190 * (technologies)$$

Model 3 reflects concept-to-launch time being explained by the joint effect of diffusion, technologies, and values innovation drivers:

$$cconcept\_to\_launch\ time = 1.730 + .286 * (diffusion) + .150 * (technologies) + .140 * (values)$$

Table 74 provides a summary of descriptors, significance level, and power of explanation of models explaining concept-to-launch time.

Table 74 – A summary of innovation drivers describing concept-to-launch time

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	diffusion	.01	19.5%
2	diffusion, technologies	.01	22.3%
3	diffusion, technologies, values	.05	23.6%

4.7.3.9 Innovation drivers as predictors of *business performance*

This statistical test estimates business performance as a function of innovation drivers. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 67, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,568[a]	,323	,321	,902
2	,619[b]	,383	,380	,862
3	,637[c]	,406	,402	,847
4	,646[d]	,418	,412	,840

a. Predictors: (Constant), prct_09

b. Predictors: (Constant), prct_09, prct_10

c. Predictors: (Constant), prct_09, prct_10, prct_21

d. Predictors: (Constant), prct_09, prct_10, prct_21, prct_02

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	148,097	1	148,097	181,902	,000[b]
	Residual	310,194	381	,814		
	Total	458,291	382			
2	Regression	175,631	2	87,816	118,057	,000[c]
	Residual	282,659	380	,744		
	Total	458,291	382			
3	Regression	186,216	3	62,072	86,466	,000[d]
	Residual	272,075	379	,718		
	Total	458,291	382			
4	Regression	191,502	4	47,875	67,832	,000[e]
	Residual	266,789	378	,706		
	Total	458,291	382			

a. Dependent Variable: perf_me

b. Predictors: (Constant), prct_09

c. Predictors: (Constant), prct_09, prct_10

d. Predictors: (Constant), prct_09, prct_10, prct_21

e. Predictors: (Constant), prct_09, prct_10, prct_21, prct_02

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2,608	,131		19,852	,000
	prct_09	,359	,027	,568	13,487	,000
2	(Constant)	2,326	,134		17,372	,000
	prct_09	,261	,030	,414	8,679	,000
	prct_10	,188	,031	,290	6,084	,000
3	(Constant)	2,111	,143		14,768	,000
	prct_09	,229	,031	,363	7,450	,000
	prct_10	,155	,031	,240	4,939	,000
	prct_21	,110	,029	,176	3,840	,000
4	(Constant)	1,976	,150		13,177	,000
	prct_09	,214	,031	,338	6,899	,000
	prct_10	,135	,032	,209	4,215	,000
	prct_21	,090	,029	,144	3,080	,002
	prct_02	,086	,031	,128	2,737	,007

a. Dependent Variable: perf_me

Figure 67 – Innovation drivers describing business performance

Model 1 reflects business performance being explained by diffusion innovation driver alone:

$$business\ performance = 2.608 + .359 * (diffusion)$$

Model 2 reflects business performance being explained by the joint effect of diffusion and values innovation drivers:

$$business\ performance = 2.326 + .261 * (diffusion) + .188 * (values)$$

Model 3 reflects business performance being explained by the joint effect of diffusion, values, and strategic alliances innovation drivers:

$$business\ performance = 2.111 + .229 * (diffusion) + .155 * (values) + .110 * (strategic\ alliances)$$

Model 4 reflects business performance being explained by the joint effect of diffusion, values, strategic alliances, and technologies innovation drivers:

$$business\ performance = 1.976 + .214 * (diffusion) + .135 * (values) + .090 * (strategic\ alliances) + .086 * (technologies)$$

Table 75 provides a summary of descriptors, significance level, and power of explanation of models explaining business performance.

Table 75 – A summary of innovation drivers describing business performance

Model	Descriptors	Significance level (Sig.)	Power of explanation (R^2)
1	diffusion	.01	32.3%
2	diffusion, values	.01	38.3%
3	diffusion, values, strategic alliances	.01	40.6%
4	diffusion, values, strategic alliances, technologies	.01	41.8%

4.7.3.10 Analyzing main findings

In general terms, no set of descriptors is capable of describing variations of internationalization outputs in more than 42%, which is low. To this regard, some models describe no more than 9%. Therefore, the main consideration is that innovation drivers seem not to alone describe business performance outputs.

Considering the most comprehensive outlook, the diffusion innovation—which means the capability of a company to successfully launching products, services, or processes to the market—seems to hold the tightest relation with business performance. It explains, alone, 11.6% of variations in sales performance, 11.2% of variations in sales growth, 19.8% of variations in quality, 18.2% of variations in market competitiveness, 19.5% of variations in concept-to-launch time, and 32.3% of business performance. Jointly with value innovation driver, they explain up to 16.8% of variations in innovation performance. Considering a threshold of 42% of explanation in variations of outputs for all models, these numbers for diffusion innovation driver appear promising. Kafouros (2008) and Saren (1984) name this process phase as ‘commercialization’, Roberts and Frohman (1978) divides it into ‘commercial development’ and ‘utilization and diffusion’, and Hansen and Birkinshaw (2007) synthesize as ‘diffusion’. Neely and Hii (1998) claim that market should be trained to absorb this novelty. It is acceptable that when a company has already generated ideas, captured them, and converted them into new products, services, or processes, the next is introducing them into the market. Without this capability of marketing the novelty, timely and directed to a correctly segmented consumer, the company cannot profit from good developments in previous stages.

The second most relevant innovation driver as a descriptor of business performance outputs is values, which means the company establishes and disseminates values that set innovation as a priority. Values appear as a descriptor of sales performance (15.5% of variations, jointly with diffusion and technologies), innovation performance (13.4% of variations), uniqueness (16.3% of variations), concept-to-launch time (23.6% of variations, jointly with diffusion and technologies), and business performance (38.3% of variations, jointly with diffusion). Values constitute the foundations of the organizational culture (Schein, 2004) pursued by the company. Although values drive the strategy to take place, it is disseminated in daily operational routines as well. And establishing and disseminating values that prioritize innovation may indirectly influence business performance through better and differentiated products, services, and processes, faster decision making and action taking, and overall innovation. As a result, values bring advantages to the company, even if their effects are indirect.

The third most relevant innovation driver as a descriptor of business performance outputs is technologies, which means possessing and managing the latest technologies. Jointly with diffusion, it explains 14.4% of variations in sales performance, 21.8% of variations in quality, and 22.3% of variations of concept-to-launch time. Jointly with values, diffusion, and intellectual capital, it explains 19.2% of variations in innovation performance. Jointly with values and institutions, it explains 22.6% of variations in uniqueness. Finally, jointly with diffusion, values, and strategic alliances, it explains 41.8% of variations in business performance. Therefore, in general terms, technologies innovation driver is important in describing business performance outputs. Especially with the settlement of fast processing computers and of the internet in the last decades, technology has expanded the possibilities for a company to compete. The number of companies gaining share through technology itself (both hardware and software) or through the use of technology in their business models (social media and content for example) has experienced a sound rise. Companies that fail to embrace technology as a vital asset to generate competitive advantages may experience sharp overthrow in coming years.

Strategic alliances innovation driver refers to the capability of a company to successfully establishing strategic alliances. Jointly with diffusion, it explains 22.1% of variations in market competitiveness; and jointly with diffusion and values, it explains 40.6% of variations in business performance. Both findings are convergent on the largely accepted rationale of achieving business success through well-established alliances with strategic partner such as suppliers, customers, government, academia, associations, and sometimes even competitors.

Ventures conducted jointly are less risky, faster, and demand a smaller amount of resources. As a result, the company reaches higher levels of market competitiveness and business performance. The Brazilian aircraft producer Embraer is such good example of this: for the production of a new line of airplanes, the company establishes joint ventures with strategic partners, each responsible for a specific part of the plane—and always within their area of expertise. Mostly, Embraer aggregates value by successfully coordinating the workloads of all partners, alone and together. Profits and risks are shared in this case of strategic alliances.

Other seven innovation drivers provide only minor contributions to explaining variation of business performance outputs: portfolio management, institutions, open communication, structure, intellectual capital, time, and workplace environment.

Institutions and open communication innovation drivers contribute to the explanation of uniqueness. Institutions innovation driver means that the company continuously monitors, gathers information, and accesses government, academia, and associations. Open communication refers to promoting open communication between people inside and outside the company. Jointly with technologies innovation driver, they increase 7.8% the explanation power of the uniqueness model. Institutions and open communication innovation drivers would barely figure as paramount initiatives for a company to improve business performance. Their absence in other business performance models may be an evidence of this. Nevertheless, when considering that uniqueness seeks for some rare and scarce feature in terms of products, services, or processes, both innovation drivers sound to be interesting and feasible ways to obtain such unique aspect. For example, thematic discussions with scholars can provide a company with more insightful considerations on new trends that can be incorporated in current or new products, services, or processes.

Portfolio management innovation driver regards successfully managing several projects, products, or services at once. It improves explanation power of the variability of cost advantage in 3.1% and of the variability of market competitiveness in 1.2%. In the case of cost advantage, portfolio management can be interpreted as the existence of synergies that yield the company to be more competitive in terms of cost.

Structure innovation driver improves explanation power of the variability of sales performance in 1%. Moreover, the direction of the contribution is negative. Time innovation driver improves explanation power of the variability of sales growth in 1.5% and workspace environment improves explanation power of the variability of quality of products, services, and processes in 1.2%. Intellectual capital innovation driver improves explanation power of the variability of innovation performance in 1% (negatively) and of the variability of cost advantage in 1.2%. These minor results do not deserve further attention because can be considered spurious.

To put all in a nutshell, two innovation drivers sound to better explain business performance outputs: (1) diffusion and (2) values. (3) Technologies innovation driver contributes to explain variations of six (out of nine) business performance outputs. (4) Strategic alliances innovation driver contributes to explain variations of two (out of nine) business performance outputs. Finally, seven innovation drivers have only a minor contribution in terms of explanation of the variation in specific business performance outputs variables: (5) structure, (6) intellectual capital, (7) time, (8) workplace environment, (9) portfolio management, (10) institutions, and (11) open communication. What draws the attention is that, contrary to expectations, structure and intellectual capital contribute negatively to variations in business performance outputs.

Tables 76 and 77, next, unveil a summary of explained outputs, descriptors, R^2, and managerial recommendation for companies expecting to increase the presented outputs. Nevertheless, a special caution is necessary while reading the suggested managerial recommendations because the power of explanation of all models are low, which means the input set of variables hold only a minor explanation of the variation in output variables.

Table 76 – A summary of innovation drivers describing business performance

Explained output	Descriptors input (coefficients in parenthesis)	R^2	Managerial recommendation
sales performance	diffusion (.424)	11.6%	Whenever a company expects to increase sales performance, the recommendation is to master the process of successfully launching products, services, or processes into the market. Moreover, it ought to process and manage the latest technologies. Then it should establish and disseminate values that set innovation as a priority. Finally, unpredictably, establishing a less hierarchical organizational structure with clear definition of roles seems to diminish the sales performance.
sales performance	diffusion (.325), technologies (.246)	14.4%	
sales performance	diffusion (.258), technologies (.200), values (.165)	15.5%	
sales performance	diffusion (.271), technologies (.219), values (.207), structure (-.135)	16.5%	
innovation performance	values (.446)	13.4%	Whenever a company expects to increase innovation performance, the recommendation is to establish and disseminate values that set innovation as a priority. Moreover, it ought to master the process of successfully launching products, services, or processes into the market. Surprisingly, enabling conditions to acquire, disseminate, and utilize useful knowledge seem to diminish innovation performance. Finally, it ought to process and manage the latest technologies.
innovation performance	values (.304), diffusion (.258)	16.8%	
innovation performance	values (.356), diffusion (.281), intellectual capital (-.144)	17.8%	
innovation performance	values (.320), diffusion (.246), intellectual capital (-.198), technologies (.181)	19.2%	
sales growth	diffusion (.372)	11.2%	Whenever a company expects to increase sales growth, the recommendation is to master the process of successfully launching products, services, or processes into the market. Moreover, it ought to allocate adequate working time for employees to conduct new—even personal—ventures.
sales growth	diffusion (.317), time (.149)	12.7%	
quality	diffusion (.368)	19.8%	Whenever a company expects to increase quality of its products, services, or processes, the recommendation is to master the process of successfully launching products, services, or processes into the market. Moreover, it ought to process and manage the latest technologies. Finally, it ought to develop a workplace with excellent levels of organizational climate.
quality	diffusion (.313), technologies (.137)	21.8%	
quality	diffusion (.285), technologies (.112), workplace environment (.109)	23.0%	
cost advantage	leadership (.251)	8.2%	Whenever a company expects to increase cost advantage, the recommendation is to have leaders who are inspirational. Moreover, it ought to successfully manage several projects, products, or services at once. Finally, it ought to acquire, disseminate, and utilize useful knowledge.
cost advantage	leadership (.175), portfolio management (.188)	11.3%	
cost advantage	leadership (.133), portfolio management (.164), intellectual capital (.122)	12.5%	

Table 77 – A summary of innovation drivers describing business performance (cont.)

Explained output	Descriptors input (coefficients in parenthesis)	R^2	Managerial recommendation
market competitiveness	diffusion (.343)	18.2%	Whenever a company expects to increase market competitiveness, the recommendation is to master the process of successfully launching products, services, or processes into the market. Moreover, it ought to successfully establish strategic alliances. Finally, it ought to successfully manage several projects, products, or services at once.
market competitiveness	diffusion (.265), strategic alliances (.174)	22.1%	
market competitiveness	diffusion (.231), strategic alliances (.131), portfolio management (.115)	23.3%	
uniqueness	values (.402)	16.3%	Whenever a company expects to increase uniqueness of products, services, and processes, the recommendation is to establish and disseminate values that set innovation as a priority. Moreover, it ought to continuously monitor, gather information, and access government, academia, and associations. Then it should process and manage the latest technologies. Finally, promoting open communication between people inside and outside the company seems to increase uniqueness of products, services, and processes.
uniqueness	values (.311), institutions (.206)	20.1%	
uniqueness	values (.246), institutions (.170), technologies (.185)	22.6%	
uniqueness	values (.207), institutions (.162), technologies (.165), open communication (.125)	24.1%	
concept-to-launch time	diffusion (.424)	19.5%	Whenever a company expects to improve concept-to-launch time, the recommendation is to master the process of successfully launching products, services, or processes into the market. Moreover, it should process and manage the latest technologies. Finally, it ought to establish and disseminate values that set innovation as a priority.
concept-to-launch time	diffusion (.343), technologies (.190)	22.3%	
concept-to-launch time	diffusion (.286), technologies (.150), values (.140)	23.6%	
business performance	diffusion (.359)	32.3%	Whenever a company expects to increase market competitiveness, the recommendation is to master the process of successfully launching products, services, or processes into the market. Moreover, it should process and manage the latest technologies. Then it ought to establish and disseminate values that set innovation as a priority. Finally, it should process and manage the latest technologies.
business performance	diffusion (.261), values (.188)	38.3%	
business performance	diffusion (.229), values (.155), strategic alliances (.110)	40.6%	
business performance	diffusion (.214), values (.135), strategic alliances (.090), technologies (.086)	41.8%	

Therefore, hypothesis 7—innovation would have positive effects on business performance—was accepted.

4.8 Describing the relations between innovation capability and business performance

The eighth hypothesis of this study is described as follows. This hypothesis was tested through the use of the statistical technique of simple linear regression:

Hypothesis 8 (conceptual level)

Innovation capability would have positive effects on business performance.

Hypothesis 8 (empirical level)

The construct of innovation capability would explain positively the business performance.

Coopers and Schindler (2008) posit when values of one variable are used to estimate the corresponding values of another variable, a single linear regression is suitable. In the case of this study, the input variable is the innovation capability, whose detailed calculations were presented previously. Innovation capability is within a 1-7 scale. The output variables are those business performance indicators, say: (1) sales performance, (2) innovation performance, (3) sales growth, (4) quality, (5) cost advantage, (6) market competitiveness, (7) uniqueness, (8) concept-to-launch time, and (9) business performance. As previously defined, business performance is defined as a composite single mean of all other eight business performance output values. All nine output variables are within a 1-7 scale as well. The applied regression method is 'stepwise'.

4.8.1 Identifying the association of innovation capability and business performance

A scatterplot is used to visually inspect a bivariate relation between variables. Coopers and Schindler (2008) emphasize scatterplots are essential to understand the relation between variables as they provide the direction, shape, and magnitude of this relation. Figure X, next, shows the scatterplot of innovation capability and business performance.

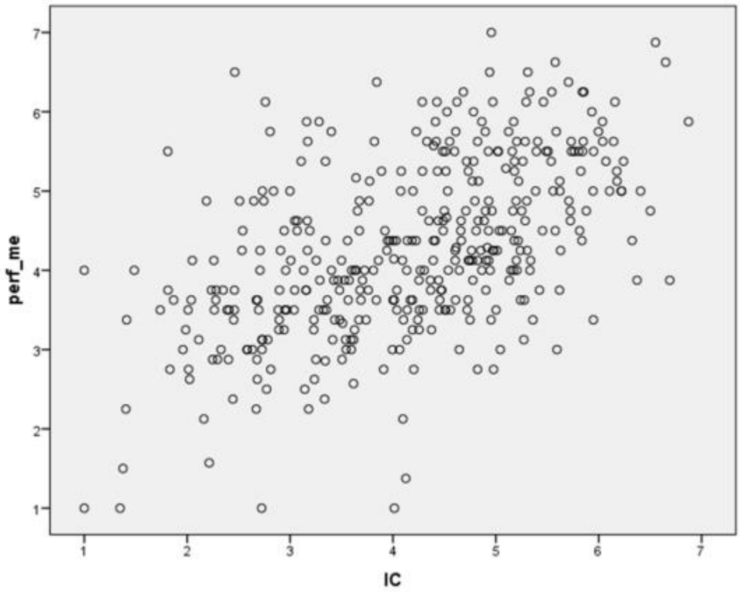

Figure 68 – Scatterplot of innovation capability and business performance

The visual inspection leads to the understanding that the relation between innovation capability and business performance is medium. Coopers and Schindler (2008) define weak relations as those with correlation less than .40 and strong relations as those with correlation above .90. In this particular experiment, innovation capability and business performance show a correlation of .53, which can be classified as medium—according to the thresholds proposed by Coopers and Schindler (2008). Although the scatterplot exhibits a cloud of somewhat dispersed dots, there is a clear definition on the direction and shape of the bivariate relation. Therefore, the relation between innovation capability and business performance is much stronger than the one between innovation capability and internationalization degree.

4.8.2 Innovation capability as predictor of *sales performance*

This statistical test estimates sales performance as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 69, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,283[a]	,080	,078	2,089

a. Predictors: (Constant), IC

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	144,805	1	144,805	33,191	,000[b]
	Residual	1657,844	380	4,363		
	Total	1802,649	381			

a. Dependent Variable: perf_01

b. Predictors: (Constant), IC

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,479	,381		3,881	,000
	IC	,508	,088	,283	5,761	,000

a. Dependent Variable: perf_01

Figure 69 – Innovation capability describing sales performance

Model 1 reflects sales performance being explained by innovation capability:

$$sales\ performance = 1.479 + .508\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 8.0% of the variation in sales performance.

4.8.3 Innovation capability as predictor of *innovation performance*

This statistical test estimates innovation performance as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 70, next.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,278[a]	,077	,075	1,994

a. Predictors: (Constant), IC

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	125,584	1	125,584	31,579	,000[b]
	Residual	1503,247	378	3,977		
	Total	1628,832	379			

a. Dependent Variable: perf_02

b. Predictors: (Constant), IC

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,358	,364		3,732	,000
	IC	,474	,084	,278	5,620	,000

a. Dependent Variable: perf_02

Figure 70 – Innovation capability describing innovation performance

Model 1 reflects innovation performance being explained by innovation capability:

$$innovation\ performance = 1.358 + .474\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 7.7% of the variation in innovation performance.

4.8.4 Innovation capability as predictor of *sales growth*

This statistical test estimates sales growth as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 71, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,269[a]	,072	,070	1,855

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	102,517	1	102,517	29,789	,000[b]
	Residual	1318,045	383	3,441		
	Total	1420,561	384			

a. Dependent Variable: perf_03

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,662	,338		4,917	,000
	IC	,427	,078	,269	5,458	,000

a. Dependent Variable: perf_03

Figure 71 – Innovation capability describing sales growth

Model 1 reflects sales growth being explained by innovation capability:

$$sales\ growth = 1.662 + \ .427\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 7.2% of the variation in sales growth.

4.8.5 Innovation capability as predictor of *quality*

This statistical test estimates quality of products, services, or processes as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 72, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,384[a]	,147	,145	1,323

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	116,031	1	116,031	66,335	,000[b]
	Residual	671,678	384	1,749		
	Total	787,710	385			

a. Dependent Variable: perf_04

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3,504	,241		14,544	,000
	IC	,454	,056	,384	8,145	,000

a. Dependent Variable: perf_04

Figure 72 – Innovation capability describing quality

Model 1 reflects quality of products, services, or processes being explained by innovation capability:

$$quality = 3.504 + \ .454\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 14.7% of the variation in quality of products, services, or processes.

4.8.6 Innovation capability as predictor of *cost*

This statistical test estimates cost advantage as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 73, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,308[a]	,095	,093	1,509

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91,572	1	91,572	40,230	,000[b]
	Residual	871,789	383	2,276		
	Total	963,361	384			

a. Dependent Variable: perf_05

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2,959	,275		10,758	,000
	IC	,404	,064	,308	6,343	,000

a. Dependent Variable: perf_05

Figure 73 – Innovation capability describing cost advantage

Model 1 reflects cost advantages being explained by innovation capability:

$$cost = 2.959 + \ .404\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 9.5% of the variation in cost advantage.

4.8.7 Innovation capability as predictor of *competitiveness*

This statistical test estimates market competitiveness as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 74, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,405[a]	,164	,162	1,271

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121,620	1	121,620	75,277	,000[b]
	Residual	620,401	384	1,616		
	Total	742,021	385			

a. Dependent Variable: perf_06

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,247	,232		14,022	,000
	IC	,465	,054	,405	8,676	,000

a. Dependent Variable: perf_06

Figure 74 – Innovation capability describing market competitiveness

Model 1 reflects market competitiveness being explained by innovation capability:

$$competitiveness = 3.247 + \ .465\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 16.4% of the variation in market competitiveness.

4.8.8 Innovation capability as predictor of *uniqueness*

This statistical test estimates uniqueness of products, services, or processes as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 75, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,414[a]	,171	,169	1,533

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	185,955	1	185,955	79,134	,000[b]
	Residual	900,004	383	2,350		
	Total	1085,958	384			

a. Dependent Variable: perf_07

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,967	,279		7,038	,000
	IC	,575	,065	,414	8,896	,000

a. Dependent Variable: perf_07

Figure 75 – Innovation capability describing uniqueness

Model 1 reflects uniqueness of products, services, or processes being explained by innovation capability:

$$uniqueness = 1.967 + .575\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 17.1% of the variation in uniqueness of products, services, or processes.

4.8.9 Innovation capability as predictor of *concept-to-launch time*

This statistical test estimates concept-to-market time as a function of innovation capability. Both input and output variables are within a 1-7 scale.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,375[a]	,141	,138	1,533

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	146,394	1	146,394	62,319	,000[b]
	Residual	895,016	381	2,349		
	Total	1041,410	382			

a. Dependent Variable: perf_08

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,129	,281		7,578	,000
	IC	,512	,065	,375	7,894	,000

a. Dependent Variable: perf_08

Figure 76 – Innovation capability describing concept-to-launch time

The main output numbers of the multiple regression analysis are exhibited in previous Figure 76.

Model 1 reflects concept-to-launch time being explained by innovation capability:

$$concept\_to\_launch\ \ time = 2.129 + \ .512\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 14.1% of the variation in concept-to-launch time.

4.8.10 Innovation capability as predictor of *business performance*

This statistical test estimates business performance as a function of innovation capability. Both input and output variables are within a 1-7 scale. The main output numbers of the multiple regression analysis are exhibited in Figure 77, next.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,530[a]	,281	,279	,9282562

a. Predictors: (Constant), IC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	129,316	1	129,316	150,078	,000[b]
	Residual	330,877	384	,862		
	Total	460,194	385			

a. Dependent Variable: perf_me

b. Predictors: (Constant), IC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,282	,169		13,495	,000
	IC	,480	,039	,530	12,251	,000

a. Dependent Variable: perf_me

Figure 77 – Innovation capability describing business performance

Model 1 reflects business performance being explained by innovation capability:

$$business\ performance = 2.282 + \ .480\ (innovation\ capability)$$

Model 1 is significant at .01 and explains 28.1% of the variation in concept-to-launch time.

4.8.11 Analyzing main findings

Table 78, as follows, displays a summary of explained outputs, descriptors, R^2, and a general managerial recommendation for companies expecting to increase the presented outputs.

Again, a special caution is necessary while reading the suggested managerial recommendations because the power of explanation of all models is low, which means the input set of variables hold only a minor explanation of the variation in output variables.

Table 78 – A summary of innovation capability describing business performance

Explained output	**Descriptors input (coefficients in parenthesis)**	**R^2**	**Managerial recommendation**
sales performance	innovation capability (.508)	8.0%	Innovation capability alone is not a good descriptor for all business performance outputs, as it explains no more than approximately 28% in the best case. Therefore, a company expecting to enhance business performance outputs should seek for other input variables.
innovation performance	innovation capability (.474)	7.7%	
sales growth	innovation capability (.427)	7.2%	
quality	innovation capability (.454)	14.7%	
cost advantage	innovation capability (.404)	9.5%	
market competitiveness	innovation capability (.465)	16.4%	
uniqueness	innovation capability (.575)	17.1%	
concept-to-launch time	innovation capability (.512)	14.1%	
business performance	innovation capability (.480)	28.1%	

As presented in Table 78, innovation capability alone is not a good descriptor for business performance outputs. In this sense, innovation in general terms seems not to further explain variations in business performance. Table 79, next, compares the results from regression outputs considering the explication power of the best models when, first, innovation drivers are run against business performance output variables, and then, innovation capability is run against these same output variables.

Table 79 – A summary of innovation drivers and innovation capability describing business performance

R^2	**perf_01**	**perf_02**	**perf_03**	**perf_04**	**perf_05**	**perf_06**	**perf_07**	**perf_08**	**perf_me**
innovation drivers	16.5%	19.2%	12.7%	23.0%	12.5%	23.3%	24.1%	23.6%	41.8%
innovation capability	8.0%	7.7%	7.2%	14.7%	9.5%	16.4%	17.1%	14.1%	28.1%

In all cases, a joint effect of two, three, or four innovation drivers results in better power of explanation of business performance output variables when compared to innovation capability alone. Thus, when a company expects to enhance increase internationalization outputs, it ought to consider acting primarily over just a specific set of innovation drivers instead of acting over all innovation drivers that compose the innovation capability.

As a result, a company expecting to enhance business performance outputs may seek for other input variables. Such variables may come from literature review on a vast body of knowledge in Business, including—but not limited to—: finance, marketing, internal processes, and people (Kaplan, & Norton, 2001, 1996). To this regard, main findings of this study shall be complemented by other variables that may help explain the variability of business performance. For example, client loyalty, profitability per unit, and employee satisfaction.

Therefore, hypothesis 8—innovation capability would have positive effects on business performance—was partially accepted: although the direction of relation is positive, the power of explanation is low.

5 FINAL CONSIDERATIONS

This study seeks for providing the body of knowledge on organizational innovation with a more comprehensive understanding on the relations between innovation and internationalization. If there exists any relation between innovation and internationalization, companies embarking on a plan to outperform competitors through internationalization may rearrange a set of innovation initiatives to meet this goal. Another general goal of this study regards describing the relations between innovation and business performance. In this case, the search for recurring better business performance is irrefutable. Again, if there is any relation between innovation and business performance, companies may achieve this goal through a new combination of initiatives that nourishes innovation.

Nevertheless, meeting both goals through a research is no less than challenging. First, this is so because innovation is a broad concept and so are the phenomena of internationalization and business performance. To this regards, a comprehensive literature review has led to narrower definitions of innovation capability, innovation drivers, internationalization, and business performance. Second, although concepts are depicted from literature and the general understanding is quite fine, they are mostly non-measureable concepts. To this concern, a translation from a conceptual frame to an empirical frame is of immense interest: constructs for innovation drivers, internationalization, and business performance were accomplished in terms of the data collection instrument, and a construct for innovation capability emerged from a theoretical composition of innovation drivers. Third, field procedures remain critical not only in terms of access to but also regarding the willingness of the respondent to participate in the research. Collecting 528 responses from 386 different companies is of positive surprise and is clear evidence that this stage was successfully overcome. Finally, the use of right methods and techniques is paramount for the achievement of correct and precise results. A quantitative approach with employment of specific statistical techniques was adopted, and each goal was subject to the most suitable technique.

The two general goals—(1) describing the relations between innovation and internationalization and (2) describing the relations between innovation and business performance—were therefore unfolded into eight specific goals, as:

- SG1: Identifying the most important innovation drivers;
- SG2: Proposing a measurable construct for the innovation capability of a company;
- SG3: Identifying the most practiced innovation drivers; and
- SG4: Describing the gaps between the importance and the practice of innovation drivers.
- SG5: Describing the relations between innovation drivers and internationalization degree;
- SG6: Describing the relations between innovation capability and internationalization degree;
- SG7: Describing the relations between innovation drivers and business performance; and
- SG8: Describing the relations between innovation capability and business performance.

Tables 80 and 81, next, provide a summary of each specific goal, the translation of the conceptual hypothesis to the empirical hypothesis, the employed statistical technique and the respective result.

Table 80 – A summary of conceptual and empirical hypothesis, specific goal, testing method, and result

Conceptual hypothesis	Empirical hypothesis	Specific goal	Testing method	Result
Innovation drivers would be not equally important for a company to innovate	Compared to others, one or more innovation drivers would show higher means of importance for a company to innovate	Identifying the most important innovation drivers	Comparison of means	Accepted
Innovation capability would derive from innovation drivers	A construct for innovation capability would be a weighted indicator derived from the importance of each innovation driver	Proposing a measurable construct for the innovation capability of a company	Factor analysis (Principal component analysis)	Accepted
Innovation drivers would be not equally practiced in companies	Compared to others, one or more innovation drivers would show higher means of practice in companies	Identifying the most practiced innovation drivers	Comparison of means	Accepted
Innovation drivers would show similarities regarding importance and practice	Innovation drivers would be grouped into clusters regarding the joint combination of importance and practice	Describing the gaps between the importance and the practice of innovation drivers	Cluster analysis	Accepted

Table 81 – A summary of conceptual and empirical hypothesis, specific goal, testing method, and result (cont.)

Conceptual hypothesis	Empirical hypothesis	Specific goal	Testing method	Result
Innovation would have positive effects on internationalization	The practice of innovation drivers would explain positively the internationalization degree	Describing the relations between innovation drivers and internationalization degree	Multiple linear regression	Partially accepted
Innovation capability would have positive effects on internationalization	The construct of innovation capability would explain positively the internationalization degree	Describing the relations between innovation capability and internationalization degree	Simple linear regression	Partially accepted
Innovation would have positive effects on business performance	The practice of innovation drivers would explain positively the business performance	Describing the relations between innovation drivers and business performance	Multiple linear regression	Accepted
Innovation capability would have positive effects on business performance	The construct of innovation capability would explain positively the business performance	Describing the relations between innovation capability and business performance	Simple linear regression	Partially accepted

The results of the study generally indicate that innovation have positive effects on internationalization. Results also show that innovation has positive effects on business performance even if in both cases magnitudes of such effects are limited. These findings unlock a numerous set of contributions and eventually pathways to future studies.

5.1 Implications

This study provides tangible contributions mainly in three domains: (1) literature, (2) methodological procedures, and (3) practice.

The academic contribution of this study progresses beyond a comprehensive review of the literature concerning the subject of innovation capability and the underlying innovation drivers. To this end, the most important contribution is the proposal of a construct for innovation capability. After reviewing initiatives that foster organizational innovation—the so-called innovation drivers—the conceptual model embraced 21 of such initiatives. These initiatives were then grouped into theoretical innovation dimensions according to their conceptual similarities. And finally, these dimensions constituted the innovation capability of the company. Nevertheless, more important was to determine the relative contribution of each driver to the general calculation of the innovation capability. Now, the innovation capability construct would be a composite simple weighted mean of all 21 innovation drivers. To determine the coefficients of each innovation driver, two approaches were taken: the first used the relative importance of each innovation driver in the total amount of importance and the resulting function is:

$$innovation\ capability = 0.052 * (people) + 0.049 * (technologies) + 0.042 * (funding) + 0.048 * (time) + 0.051 * (intellectual\ capital) + 0.052 * (generation) + 0.046 * (capture) + 0.050 * (conversion) + 0.046 * (diffusion) + 0.048 * (values) + 0.046 * (risk\ management) + 0.051 * (leadership) + 0.049 * (open\ communication) + 0.048 * (strategy) + 0.045 * (structure) + 0.048 * (reward\ system) + 0.049 * (workplace\ environment) + 0.038 * (portfolio\ management) + 0.049 * (competitive\ forces) + 0.045 * (institutions) + 0.048 * (strategic\ alliances)$$

And the second approach used the relative factor loading of each innovation driver in the total amount of factor loading—results from the application of factor analysis. The result is:

$$innovation\ capability = 0.032 * (people) + 0.040 * (technologies) + 0.041 * (funding) + 0.031 * (time) + 0.047 * (intellectual\ capital) + 0.045 * (generation) + 0.045 * (capture) + 0.053 * (conversion) + 0.043 * (diffusion) + 0.104 * (risk\ management) + 0.140 * (leadership) + 0.161 * (open\ communication) + 0.084 * (strategy) + 0.022 * (workplace\ environment) + 0.036 * (competitive\ forces) + 0.035 * (institutions) + 0.039 * (strategic\ alliances)$$

This second result seems to be more realistic, since it was derived from a statistical technique run over a whole real set of data.

Moreover, this study proposed two measureable constructs: one to embrace the concepts of internationalization degree and another to represent the concepts of business performance. Internationalization degree was presented as a single mean of a composite set of: (1) income from abroad, (2) number of employees abroad, (3) number of host countries, (4) internationalization maturity, (5) psychic difference, and (6) internationalization commitment. On the other hand, business performance was calculated as a single mean of a composite set of: (1) sales performance, (2) innovation performance, (3) sales growth, (4) quality, (5) cost advantage, (6) market competitiveness, (7) uniqueness, and (8) concept-to-launch time. These two constructs can be deployed for the purposes of other research that has to measure internationalization degree or business performance. Even practitioners can benefit from these two proposals, in the sense that they can calculate the internationalization degree or the business performance of their own companies and compare such indicators to those from competitors. These are therefore the academic contributions of this study.

Next, concerning the field of methodological procedures, this study contributed twice: first, while converting the conceptual model of innovation drivers into measurable adapted 1-7 points Likert scale affirmatives. These affirmatives were subject to content validation by two scholars and two practitioners followed by a pre-test with two colleagues, two industry experts, and five target respondents. As a result, the final version of the questionnaire (for details, see Appendix 03) is a validated tool for measuring innovation drivers. Finally, as a bonus, the final version of the questionnaire was translated into Brazilian Portuguese, as the field research was conducted in Brazil (for details, see Appendix 04).

In the search for rigor, the second methodological contribution remains in the debate about the conditions for a statistical technique to be used. The most prominent case regards selecting an adequate technique to compare means. Table 82 shows which test to choose when normality, independence of samples, and number of variables are considered.

Table 82 – Tests for comparing means regarding normality, independence, and number of variables

	2 variables **independent samples**	**3+ variables** **independent samples**	**2 variables** **related samples**
parametric test	unpaired *t*-test ANOVA F-test	one-way ANOVA	paired *t*-test
non-parametric test	Mann-Whitney U test	Kruskal-Wallis	Wilcoxon singed-rank

Source: based on Martins and Theóphilo (2009).

Moreover, an insightful debate on detection of outliers and on normality tests was conducted. Detection of outliers included the considerations on univariate techniques of Grubbs, Pierce, Chauvenet, Dixon’s Q, and standardized scores, which was the selected technique. Bivariate and multivariate techniques considered the Mahalanobis D^2 measure. Regarding tests of normality, three analyzes were considered: (1) graphical inspection, (2) Shapiro-Wilk and Kolmogorov-Smirnov tests, and (3) statistical tests for skewness and kurtosis.

Finally, the use of specific statistical techniques for specific tests proved that a statistical technique is selected only after the full understand of the purposes of the study. To this regard, comparing means was adequate for the creation of a ranking, factor analysis was adequate for reducing data, cluster analysis was adequate for identifying similarities in the cases, and linear regression was adequate for finding descriptors of outputs.

Next and the most valuable contributions of this study revolve about those with implications for organizations decision makers in formulation and managerial practices. In general terms, results allow managers not only to make decisions but also prioritize initiatives when a certain outcome is expected.

This study provides a complete up-to-date figure on the importance and practice of innovation drivers. Having access to the most important innovation drivers allows managers to establish a sort of benchmark and allows them to direct efforts and resources for the implementation or development of given innovation drivers. Actually, the most important innovation drivers are: (1) idea generation, (2) people, (3) leadership, and (4) intellectual capital.

Managers can then carry out a research at their own companies to calculate the grades for the practice of each innovation driver and compare such grades with the settled benchmark. The result is a radar chart that evidences innovation drivers that are considered important, but poorly practiced in their own companies. Figure 78, next, uses resulting data from this study on importance and practice to provide an example on how would this radar chart look like.

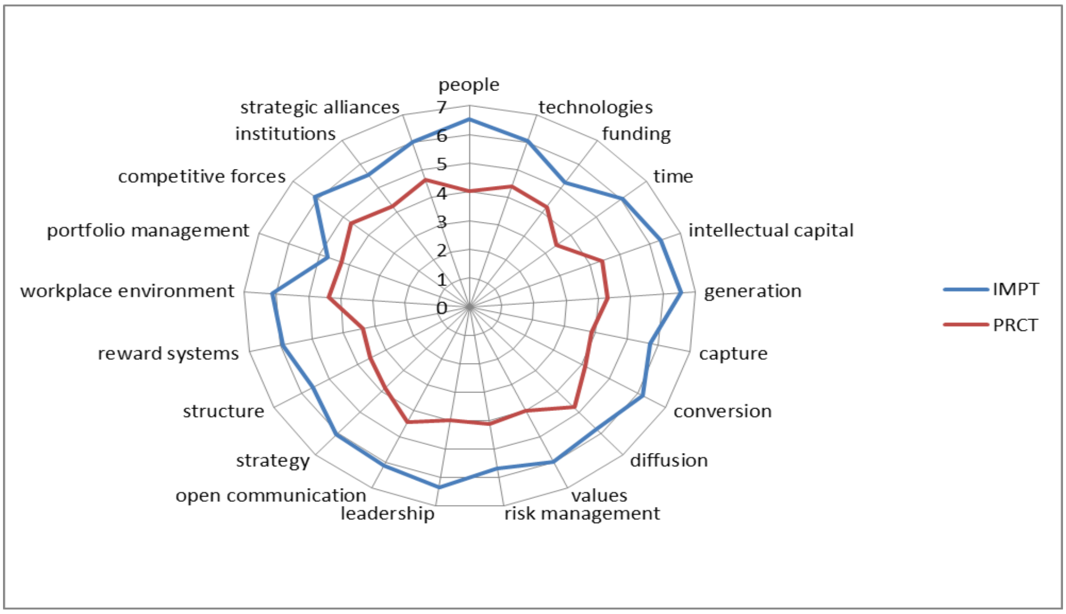

Figure 78 – Importance and practice of innovation drivers

The solution ought to be customized and may provide managers with an accurate sense of prioritization especially in times of scarce resources.

Likewise, the cluster analysis performed for testing SG4 results in innovation drivers to be prioritized: (1) idea generation, (2) people, (3) leadership, and (4) intellectual capital. This cluster embraces innovation that are very important but with only moderate levels of practice. These are the same innovation drivers from the results of SG1 testing. The novelty here is the inclusion of conversion innovation driver as one to be prioritized as well.

Next, concerning the analyzed relations between innovation and internationalization, Table 83 provides a summary of internationalization indicators, potential predictors and power of explanation of each model. Considering the tradeoffs of inserting an additional predictor to the model, variables contributing for explanation less than 2% were discarded, except when the variable was already a stable predictor for another internationalization output.

Table 83 – Summary of internationalization models

Internationalization indicator	**Predictors**	**R^2**
income from abroad	funding (.282), workplace environment (.235)	7.3%
income from abroad	innovation capability (.445)	4.4%
number of host countries	funding (.247), diffusion (.228)	8.2%
number of host countries	innovation capability (.449)	5.2%
number of employees abroad	funding (.345), values (.262)	10.5%
number of employees abroad	innovation capability (.527)	5.6%
internationalization maturity	funding (.290), diffusion (.229)	9.5%
internationalization maturity	innovation capability (.512)	6.6%
psychic difference	funding (.264), diffusion (.237)	7.6%
psychic difference	innovation capability (.474)	4.9%
internationalization commitment	funding (.260), strategy (.206)	9.0%
internationalization commitment	innovation capability (.444)	5.6%
internationalization degree	funding (.285), diffusion (.224)	10.6%
internationalization degree	innovation capability (.481)	6.8%

First general consideration is that all set of predictors seem not to substantially explain internationalization, since best models reach approximately 10% of the variability of outputs. Then, innovation capability seems not to be a good predictor of internationalization. In these cases, best power of explanation achieved a number as low as 6.8%, which can be even classified as spurious. When individual innovation drivers were considered, a bit more promising results were reached—though not too much. As a result, two innovation drivers—among all 21 considered—seem to better describe variations in internationalization: (1) funding and (2) diffusion. Funding refers to providing access to a variety of funding channels, both inside and outside the company. Furthermore, diffusion refers to successfully launching products, services, or processes to the market. Other innovation drivers, such as values, strategy, and workplace environment, can be considered descriptors only in specific situation. Therefore, the ultimate recommendation is: when considering achieving better results in terms of internationalization, a company should have innovation drivers funding and diffusion well established.

Proceeding to the analyzed relations between innovation and business performance, Table 84 provides a summary of business performance indicators, potential predictors and power of explanation of each model.

Table 84 – Summary of business performance models

Business performance indicator	**Predictors**	**R^2**
sales performance	diffusion (.258), technologies (.200), values (.165)	15.5%
sales performance	innovation capability (.508)	8.0%
innovation performance	values (.304), diffusion (.258)	16.8%
innovation performance	innovation capability (.474)	7.7%
sales growth	diffusion (.372)	11.2%
sales growth	innovation capability (.427)	7.2%
quality	diffusion (.313), technologies (.137)	21.8%
quality	innovation capability (.454)	14.7%
cost advantage	leadership (.175), portfolio management (.188)	11.3%
cost advantage	innovation capability (.404)	9.5%
market competitiveness	diffusion (.231), strategic alliances (.131), portfolio management (.115)	23.3%
market competitiveness	innovation capability (.465)	16.4%
uniqueness	values (.246), institutions (.170), technologies (.185)	22.6%
uniqueness	innovation capability (.575)	17.1%
concept-to-launch time	diffusion (.286), technologies (.150), values (.140)	23.6%
concept-to-launch time	innovation capability (.512)	14.1%
business performance	diffusion (.229), values (.155), strategic alliances (.110)	40.6%
business performance	innovation capability (.480)	28.1%

Considering the tradeoffs of inserting an additional predictor to the model, variables contributing for explanation less than 2% were discarded, except when the variable was already a stable predictor for another internationalization output.

In this scenario, numbers are promising. This is the special case of three innovation drivers describing business performance: (1) diffusion, (2) technologies, and (3) strategic alliances. These three drivers alone account for explaining more than 40% of business performance. Diffusion innovation driver refers to successfully launching products, services, or processes to the market. Technologies innovation driver means possessing and managing the latest technologies. And strategic alliances innovation driver regards successfully establishing strategic alliances. Although further research should investigate other initiatives that explain business performance, mastering these three innovation drivers seem to provide a company with a capability of better outperform competitors. Other innovation drivers, such as values, leadership, portfolio management, and institutions, can be considered descriptors only in specific situation. Therefore, the ultimate recommendation is: when considering achieving better results in terms of business performance, a company should at excel at diffusion, technologies, and strategic alliances.

5.2 Limitations

The limitations of this study are unfolded into three domains: (1) literature, (2) field research, and (3) methods.

First, limitations on the literature domain encompass width and depth of literature review in terms of depicting a frame to serve as foundations of the proposed conceptual model. The conceptual model tried to present innovation drivers that could better describe a construct for innovation capability. To this regards, some content were naturally subject to researcher's imprinted interpretations on the concepts. Moreover, an up-to-date review of the literature could revolve about newer discussion and, eventually, complimentary findings to those depicted in this study. Nevertheless, this limitation seems not to have constrained the presented main contributions.

Next, it is in the field research domain that lay the most severe limitations. This study was designed to consider valid responses from no less than senior executives working for companies operating in Brazil because their opinions are supposed to represent real needs of managerial demand. For the next part of the research, it was expected the collection of responses from companies operating in Brazil preferably big, innovative, and internationalized. Notwithstanding because of access constraints, this study counted on responses provided from graduate students in Brazilian business schools. Although it has proved to be a feasible and really good approach, limitations are evident: first, not all executives are senior—actually, only a minority can be considered senior—; then, as a side effect, not all respondents could provide precise information about the companies they work for. Nevertheless, even facing such constraints, conducting the field research with graduate students in Brazilian business schools proved to be the best option for collecting data and that would otherwise not be possible. Furthermore, the field research was conducted solely in Brazil and albeit the immense potential to extrapolate main findings, the results would benefit mostly managers of companies operating in Brazil.

Finally, limitations in terms of methods embrace analysis of multivariate outliers and tests of multivariate normality. Even if analysis of multivariate outliers was carried out, a huge limitation regards the non-identification of which combinations can be considered outliers. The most common technique, the Mahalanobis D^2 measure, is a general assessment of data homogeneity and provides no evidence of which cases constitute outliers. Furthermore, tests of multivariate normality lead to dead result when departures from normality are observed. This research faced both the problem of multivariate outliers and the problem of multivariate non-normality. Although the practical solution was in line with Hair Jr. et al. (2006) suggestions, the limitation lingers. The authors propose that large sample sizes—more than 200—attenuate the effects of non-normality to the extent to make them negligible.

5.3 Future studies

This study has generally focused mainly on the ‘what’ and less on the ‘how’. ‘What’ means shedding light on what innovation drivers should be deployed to better achieve a certain result while the ‘how’ refers to the initiatives necessary to implement innovation drivers. Therefore, future studies should address pathways to put innovation drivers into practice. To this end, in-depth qualitative approaches are highly suggested. Complementary results from both quantitative and qualitative approaches can provide powerful insights on how to achieve more internationalization and more business performance.

Findings of this research provide scholars and academics with a comprehensive up-to-date picture of the importance and practice of innovation drivers in the Brazilian context. Nevertheless, an interesting pathway of future studies encompass similar studies that describe the relations between innovation and internationalization, and between innovation and business performance controlling for demographics, such as company's size, maturity, and industry.

The proposal of a construct for innovation capability derived from 21 innovation drivers and the rationale is that drivers serve as descriptors for the construct. This approach is fine for the purposes of this study. Notwithstanding, internal relations among drivers were not assessed. Some of those relations appear to be quite obvious: a company can only excel at successfully launching products, services, or processes to the market once creative idea was generated, captured, and converted into some tangible solution. To this regard, the employment of structural equation modelling, SEM, seems to be a quite useful technique.

Accordingly, Lawson and Samson (2001, p. 396), claim "further research should be also directed at identifying and refining measures for different forms or degrees of innovation capability. For example, there may be different emphasis on elements required for radical versus incremental innovation. This would provide a fuller picture of innovation within organizations."

Brazil is in evidence because of important international events being conducted in the country within the next two years: FIFA Soccer World Cup in 2014 and the Olympic Games in 2016. This enhances the importance and contributions of this study. Nevertheless, conducting similar research in other economies is of large contribution to the body of knowledge on innovation, internationalization, and business performance because comparison of results may lead to a more or to a less generalized finding. As a consequence, managerial body can adopt or adapt some innovation initiatives to nourish advantages and, eventually, outperform competitors.

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ANNEX

ANNEX 01 – QUESTIONS FOR INNOVATION MEASUREMENT PERFORMANCE

ANNEX 01 – QUESTIONS FOR INNOVATION MEASUREMENT PERFORMANCE

MEASUREMENT SCALES FOR TECHNOLOGICAL INNOVATION PERFORMANCE

Sales Performance

Sales ($) due to technologically new or improved products as a percentage of total sales ($) during the past three years:

i) < 5%	ii) 5 - 10%	iii) 10 - 15%	iv) 15 - 20%
v) 20 - 25%	vi) 25-30%	vii) >30%	

Innovation Performance

Number of commercialized new products as percentage of all products in company per year during the past three years:

i) < 5%	ii) 5 - 10%	iii) 10 - 15%	iv) 15 - 20%
v) 20 - 25%	vi) 25-30%	vii) >30%	

Sales Growth

Company's annual sales growth rate during the past three years:

i) < 5%	ii) 5 - 10%	iii) 10 - 15%	iv) 15 - 20%
v) 20 - 25%	vi) 25-30%	vii) >30%	

Product performance

Performance on the following parameters as compared with competitors during the past three years

Product Performance Parameters	**Compared with Competitor** Poor						Better
a. Product quality	1	2	3	4	5	6	7
b. Cost advantage	1	2	3	4	5	6	7
c. Market competitiveness	1	2	3	4	5	6	7
d. Uniqueness of the product and/or process technology employed	1	2	3	4	5	6	7
e. Average product concept-to-launch time	1	2	3	4	5	6	7

APPENDICES

APPENDIX 01 – QUESTIONNAIRE

Dear respondent, you have been selected to take part into an international research project, whose results will benefit both scholars and practitioners.

This study aims at providing a more comprehensive understanding on the relation of two phenomena usually regarded as strategies by which a company can grow: (1) innovation and (2) internationalization. It is divided into 3 sections and filling it out takes approximately 10 minutes. No individual data will be made public.

If you are not currently employed, consider the most relevant job of your professional background within the last three years.

Section 1: Left part regards your OPINION on given affirmatives. Put an 'X' on the items that best describe your opinion. Right part regards your PERCEPTION on what actually happens in the company you work for. Put an 'X' on the items that best describe what actually happens in the company you work for.

I consider that...	1 = totally disagree 7 = totally agree	I consider that the company I work for...	1 = totally disagree 7 = totally agree
… attracting, retaining, and training extremely talented people is very important for a company to innovate.	1 ○○○○○○○ 7	… attracts, retains, and trains extremely talented people.	1 ○○○○○○○ 7
… possessing and managing the latest technologies is very important for a company to innovate.	1 ○○○○○○○ 7	… possesses and manages the latest technologies.	1 ○○○○○○○ 7
… providing access to a variety of funding channels—both inside and outside the company—is very important for a company to innovate.	1 ○○○○○○○ 7	… provides access to a variety of funding channels—both inside and outside the company.	1 ○○○○○○○ 7
… allocating adequate working time for employees to conduct new—even personal—ventures is very important for a company to innovate.	1 ○○○○○○○ 7	… allocates adequate working time for employees to conduct new—even personal—ventures.	1 ○○○○○○○ 7
… acquiring, disseminating, and utilizing useful knowledge is very important for a company to innovate.	1 ○○○○○○○ 7	… acquires, disseminates, and utilizes useful knowledge.	1 ○○○○○○○ 7
… stimulating creativity and continuously generating new ideas is very important for a company to innovate.	1 ○○○○○○○ 7	… stimulates creativity and continuously generates new ideas.	1 ○○○○○○○ 7
… systematically selecting the best ideas is very important for a company to innovate.	1 ○○○○○○○ 7	… systematically selects the best ideas.	1 ○○○○○○○ 7
… converting ideas into feasible projects is very important for a company to innovate.	1 ○○○○○○○ 7	… converts ideas into feasible projects.	1 ○○○○○○○ 7
… successfully launching projects to the market is very important for a company to innovate.	1 ○○○○○○○ 7	… successfully launches projects to the market.	1 ○○○○○○○ 7
… establishing and disseminating values that set innovation as a priority is very important for a company to innovate.	1 ○○○○○○○ 7	… establishes and disseminates values that set innovation as a priority.	1 ○○○○○○○ 7
… being tolerant to calculated risk is very important for a company to innovate.	1 ○○○○○○○ 7	… is tolerant to calculated risk.	1 ○○○○○○○ 7
… having leaders who are inspirational is very important for a company to innovate.	1 ○○○○○○○ 7	… has leaders who are inspirational.	1 ○○○○○○○ 7
… promoting open communication between people inside and outside the company is very important for a company to innovate.	1 ○○○○○○○ 7	… promotes open communication between people inside and outside the company.	1 ○○○○○○○ 7
… establishing and disseminating a clear strategy that sets innovation as a priority is very important for a company to innovate.	1 ○○○○○○○ 7	… establishes and disseminates a clear strategy that sets innovation as a priority.	1 ○○○○○○○ 7
… establishing a less hierarchical organizational structure with clear definition of roles is very important for a company to innovate.	1 ○○○○○○○ 7	… establishes a less hierarchical organizational structure with clear definition of roles.	1 ○○○○○○○ 7
… establishing and disseminating a clear reward program that benefit those who bring contributions is very important for a company to innovate.	1 ○○○○○○○ 7	… establishes and disseminates a clear reward program that benefit those who bring contributions.	1 ○○○○○○○ 7
… having a workplace with excellent levels of organizational climate is very important for a company to innovate.	1 ○○○○○○○ 7	… has a workplace with excellent levels of organizational climate.	1 ○○○○○○○ 7
… successfully managing several projects at once is very important for a company to innovate.	1 ○○○○○○○ 7	… successfully manages several projects at once.	1 ○○○○○○○ 7
… continuously monitoring, gathering information, and accessing customers, suppliers, and competitors is very important for a company to innovate.	1 ○○○○○○○ 7	… continuously monitors, gathers information, and accesses customers, suppliers, and competitors.	1 ○○○○○○○ 7
… continuously monitoring, gathering information, and accessing government, academia, and associations is very important for a company to innovate.	1 ○○○○○○○ 7	… continuously monitors, gathers information, and accesses government, academia, and associations.	1 ○○○○○○○ 7
… successfully establishing strategic alliances is very important for a company to innovate.	1 ○○○○○○○ 7	… successfully establishes strategic alliances.	1 ○○○○○○○ 7

Section 2: Left part regards your PERCEPTION on the degree of internationalization of the company you work for. Right part regards your PERCEPTION on the business performance of the company you work for. Put an 'X' on the item that best describes what actually happens in the company you work for.

Degree of Internationalization		
% of income from abroad (if no internationalization, consider < 5%)	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Number of host countries (host countries are those where the company has initiatives, except the home country)	a) 0 b) 1 c) 2 – 5 d) 5 – 10	e) 10 – 20 f) 20 – 50 g) > 50
Number of own employees abroad (if no employees abroad, consider < 9)	a) < 9 b) 10 – 19 c) 20 – 49 d) 50 – 99	e) 100 – 499 f) 500 – 1000 g) > 1000
Initial year of internationalization	a) None b) Last 2 years c) 2 – 5 d) 5 – 10	e) 10 – 20 f) 20 – 40 g) > 40
Psychic difference of host countries (how different are the host countries, if any, when compared to the origin country, in terms of language, culture, legislation, business conditions, etc.)	1 ○○○○○○○ 7 1 = totally disagree 7 = totally agree (if no internationalization, consider 1)	
Internationalization commitment (higher levels of commitment may encompass activities in lower levels)	a) no international activities b) export through partners c) export through own agents	d) settlement of own business offices e) settlement of own productive units f) integration of global sourcing and distribution g) settlement of R&D units

Business Performance		
Sales ($) due to technologically new or improved products—or services—as a percentage of total sales ($) during the past three years	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Number of commercialized new products as percentage of all products in company per year during the past three years	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Company's annual sales growth rate during the past three years	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Performance on the following parameters as compared with competitors during the past three years	Compared with main competitors 1 = poorer 7 = better	
Product quality	1 ○○○○○○○ 7	
Cost advantage	1 ○○○○○○○ 7	
Market competitiveness	1 ○○○○○○○ 7	
Uniqueness of the product and/or process technology employed	1 ○○○○○○○ 7	
Average product concept-to-launch time	1 ○○○○○○○ 7	

Section 3: Left part regards information about the respondent. Right part regards information about the company you work for. We kindly request that you identify the company you work for in order to identify how many companies are being representing in this study. No individual data will be made public, only consolidated and processed data. Put an 'X' on the item that best describes you and that best describes what actually happens in the company you work for.

Your profile			**Profile of the company you work for. Id:**		
Age	a) 18 – 24 b) 24 – 30 c) 30 – 36	d) 36 – 48 e) 49+	Number of employees	a) < 9 b) 10 – 19 c) 20 – 49	d) 50 – 99 e) 100 – 499 f) > 500
Gender	a) Male b) Female		Industry	a) Agribusiness b) Manufacturing c) Finance	d) Utilities e) Other Services
Highest academic degree	a) Graduate degree b) Graduate student c) Undergraduate degree	d) Undergraduate student e) Do not possess a major degree	Initial year of activities	a) Last 2 years b) 2 – 5 c) 5 – 10	d) 10 – 20 e) > 20
Position in the firm	a) High Management: Owner, CEO, VP, or equivalent b) Middle Management: Manager or equivalent c) Low Management: Coordinator, Supervisor, or equivalent d) Operations: Analyst, Specialist, or equivalent e) Intern		Country of origin	a) Brazil b) Latin America c) US or Canada d) Europe e) Other	
Department	a) Strategy and Business Development b) Finance c) Marketing d) Operations	e) People Management f) R&D g) Information Technology	Yearly income	a) < BRL 2.4 million b) BRL 2.4 – 16 million c) BRL 16 million – 90 million d) BRL 90 million – 300 million e) > BRL 300 million	

Thank you for your valuable time!

APPENDIX 02 – QUESTIONNAIRE (BRAZILIAN PORTUGUESE VERSION)

Caro respondente, você foi selecionado para participar de um projeto de pesquisa internacional, cujos resultados beneficiarão a academia e o mercado.

Este estudo pretende entender, de forma mais ampla, dois fenômenos geralmente aceitos como estratégias adotadas para uma empresa crescer: (1) inovação e (2) internacionalização. O questionário está dividido em 3 partes e seu preenchimento dura de 10 a 15 minutos. Nenhuma informação individual se tornará publica.

Se você não estiver empregado, atualmente, considere a ocupação mais relevante de seu histórico profissional, desde que ela seja nos últimos três anos.

Parte 1: Nas colunas à esquerda, forneça sua OPINIÃO para as afirmativas. Coloque um 'X' nas pontuações que melhor descrevam sua opinião. Nas colunas à direita, forneça sua PERCEPÇÃO sobre o que acontece na sua empresa. Coloque um 'X' nas pontuações que melhor descrevam o que acontece na sua empresa.

Considero que…	**1 = discordo totalmente 7 = concordo totalmente**	**Considero que a empresa para a qual trabalho…**	**1 = discordo totalmente 7 = concordo totalmente**
… atrair, desenvolver e reter pessoas talentosas é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… atrai, desenvolve e retém pessoas talentosas.	1 ○○○○○○○ 7
… possuir e gerenciar as tecnologias mais atuais é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… possui e gerencia as tecnologias mais atuais.	1 ○○○○○○○ 7
… prover acesso a vários meios de financiamento, tanto dentro quanto fora da empresa, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… provê acesso a vários meios de financiamento, tanto dentro quanto fora da empresa.	1 ○○○○○○○ 7
… destinar tempo de trabalho adequado para empregados conduzirem novos projetos (inclusive pessoais) é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… destina tempo de trabalho adequado para empregados conduzirem novos projetos (inclusive pessoais).	1 ○○○○○○○ 7
… viabilizar condições para adquirir, disseminar e utilizar conhecimento que seja útil é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… viabiliza condições para adquirir, disseminar e utilizar conhecimento que seja útil.	1 ○○○○○○○ 7
… estimular a criatividade e a geração de novas ideias é muito importante para uma empresa inovar.	1 ○○○○○○○ 7	… estimula a criatividade e a geração de novas ideias.	1 ○○○○○○○ 7
… sistematicamente selecionar as melhores ideias é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… sistematicamente seleciona as melhores ideias.	1 ○○○○○○○ 7
… transformar as ideias em projetos viáveis é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… transforma as ideias em projetos viáveis.	1 ○○○○○○○ 7
… lançar produtos, serviços ou processos no mercado, com sucesso, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… lança produtos, serviços ou processos no mercado, com sucesso.	1 ○○○○○○○ 7
… definir e disseminar valores que estabeleçam a inovação como uma prioridade é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… define e dissemina valores que estabeleçam a inovação como uma prioridade.	1 ○○○○○○○ 7
… ser tolerante ao risco calculado é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… é tolerante ao risco calculado.	1 ○○○○○○○ 7
… ter líderes inspiradores é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… tem líderes inspiradores.	1 ○○○○○○○ 7
… promover uma comunicação aberta (livre) entre as pessoas, dentro e fora da empresa, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… promove uma comunicação aberta (livre) entre as pessoas, dentro e fora da empresa.	1 ○○○○○○○ 7
… definir e disseminar uma estratégia que estabeleça a inovação como uma prioridade é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… define e dissemina uma estratégia que estabeleça a inovação como uma prioridade.	1 ○○○○○○○ 7
… definir uma estrutura organizacional menos hierárquica e com clara definição de papéis é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… define uma estrutura organizacional menos hierárquica e com clara definição de papéis.	1 ○○○○○○○ 7
… definir e disseminar um programa de recompensas, que beneficie quem traga contribuições relevantes, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… define e dissemina um programa de recompensas, que beneficie quem traga contribuições relevantes.	1 ○○○○○○○ 7

… ter um ambiente de trabalho com excelente nível de clima organizacional é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… tem um ambiente de trabalho com excelente nível de clima organizacional.	1 ○○○○○○○ 7
… gerenciar vários projetos, produtos ou serviços, ao mesmo tempo, com sucesso, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… gerencia vários projetos, produtos ou serviços, ao mesmo tempo, com sucesso.	1 ○○○○○○○ 7
… monitorar, coletar informações e ter acesso a consumidores, fornecedores e concorrentes, continuamente, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… monitora, coleta informações e tem acesso a consumidores, fornecedores e concorrentes, continuamente.	1 ○○○○○○○ 7
… monitorar, coletar informações e ter acesso ao Governo, academia e associações, continuamente, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… monitora, coleta informações e tem acesso ao Governo, academia e associações, continuamente.	1 ○○○○○○○ 7
… estabelecer alianças estratégicas, com sucesso, é muito importante para que uma empresa inove.	1 ○○○○○○○ 7	… estabelece alianças estratégicas, com sucesso.	1 ○○○○○○○ 7

Parte 2: Nas colunas à esquerda, forneça sua PERCEPÇÃO sobre o grau de internacionalização da sua empresa. Nas colunas à direita, forneça sua PERCEPÇÃO sobre o desempenho organizacional da sua empresa. Coloque um 'X' nos itens que melhor descrevam o que acontece na sua empresa.

Grau de Internacionalização		
% do faturamento que vem do exterior (se não há internacionalização, considerar < 5%)	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Número de países em que a empresa está presente, exceto o país de origem	a) 0 b) 1 c) 2 – 5 d) 5 – 10	e) 10 – 20 f) 20 – 50 g) > 50
Número de empregados próprios que estão no exterior (se não há empregados no exterior, considerar < 10)	a) < 10 b) 10 – 19 c) 20 – 49 d) 50 – 99	e) 100 – 499 f) 500 – 1000 g) > 1000
Ano inicial de internacionalização (se não há internacionalização, considerar 0)	a) 0 b) Últimos 2 anos c) 2 – 5 d) 5 – 10	e) 10 – 20 f) 20 – 40 g) > 40
No geral, quão diferentes são os países em que a empresa está presente, em relação ao país de origem, em termos de língua, cultura, legislação e condições de negócios?	1 ○○○○○○○ 7 1: pouco diferente 7: muito diferente (se não há internacionalização, considerar 1)	

Desempenho Organizacional		
Vendas ($) de produtos ou serviços tecnologicamente novos ou melhorados como percentual do total de vendas ($), nos últimos três anos (média anual).	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Número de produtos ou serviços tecnologicamente novos ou melhorados como percentual do total de produtos ou serviços, nos últimos três anos (média anual).	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Taxa de crescimento anual das vendas, nos últimos três anos (média anual).	a) < 5% b) 5 – 10% c) 10 – 15% d) 15 – 20%	e) 20 – 25% f) 25 – 30% g) > 30%
Desempenho dos seguintes parâmetros, quando comparados com concorrentes, na média dos últimos três anos:	Comparação com concorrentes 1 = pior 7 = melhor	
Qualidade de produto	1 ○○○○○○○ 7	
Vantagem de custo	1 ○○○○○○○ 7	
Competitividade	1 ○○○○○○○ 7	
Raridade da tecnologia de produto, serviço ou processo	1 ○○○○○○○ 7	
Tempo médio de lançamento de um produto ou serviço para o mercado	1 ○○○○○○○ 7	

Comprometimento com a internacionalização (níveis mais altos podem incluir atividades dos níveis mais baixos)	a) não há internacionalização b) exportação por meio de parceiros c) exportação por agentes próprios	d) instalação de escritórios próprios e) instalação de unidades produtivas próprias	f) integração global de fornecimento e distribuição g) instalação de unidades de P&D (centro de pesquisa e desenvolvimento)

Parte 3: Nas colunas à esquerda, forneça informações sobre você. Nas colunas à direita, forneça informações sobre sua empresa. Solicitamos a gentileza de **IDENTIFICAR A EMPRESA** para que estimemos quantas empresas diferentes estão sendo representadas neste estudo. Nenhuma informação individual se tornará pública, apenas a informação consolidada e processada. Coloque um 'X' nos itens que melhor descrevam você e sua empresa.

Perfil do respondente			**Perfil da empresa para a qual trabalha** **Nome da empresa:**		
Idade	a) 18 – 24 b) 24 – 30 c) 30 – 36	d) 36 – 48 e) >= 49	Número de empregados	a) < 10 b) 10 – 19 c) 20 – 49	d) 50 – 99 e) 100 – 499 f) >= 500
Gênero	a) Masculino b) Feminino		Setor	a) Agronegócio b) Indústria c) Finanças	d) *Utilities* e) Outros serviços
Maior titulação acadêmica	a) Pós-graduação completa b) Aluno de pós-graduação c) Graduação completa	d) Aluno de graduação e) Sem titulação	Ano inicial das atividades	a) Últimos 2 anos b) 2 – 5 c) 5 – 10	d) 10 – 20 e) > 20
Cargo ou atividade	a) Alta Direção: dono, sócio, presidente, CEO, VP, diretor ou equivalente b) Média Gerência: gerente ou equivalente c) Baixa Gerência: coordenador, supervisor ou equivalente d) Operações: analista, especialista ou equivalente e) Estagiário		Local de origem	a) Brasil b) América Latina c) EUA ou Canadá d) Europa e) Ásia f) Outro	
Departamento	a) Estratégia e desenvolvimento de negócios b) Tecnologia da informação c) Finanças d) Marketing	e) Operações f) Gestão de pessoas g) P&D	Receita anual	a) < R$2,4 milhões b) R$2,4 – 16 milhões c) R$16 milhões – 90 milhões d) R$90 milhões – 300 milhões e) > R$300 milhões	

Obrigado pela sua valiosa contribuição!

APPENDIX 03 – CORRELATION MATRIX FOR IMPT VARIABLES

Correlations

		impt_01	impt_02	impt_03	impt_04	impt_05	impt_06	impt_07	impt_08	impt_09	impt_10	impt_11	impt_12	impt_13	impt_14	impt_15	impt_16	impt_17	impt_18	impt_19	impt_20	impt_21
impt_01	Pearson Correlation	1	,281**	,209**	,118**	,229**	,217**	,194**	,177**	,112*	,178**	,139**	,212**	,137**	,121**	,137**	,239**	,146**	,171**	,087	,167**	,108*
	Sig. (2-tailed)		,000	,000	,007	,000	,000	,000	,000	,011	,000	,002	,000	,002	,006	,002	,000	,001	,000	,050	,000	,015
	N	518	514	511	511	513	513	517	514	511	509	513	512	512	515	511	509	512	514	511	508	510
impt_02	Pearson Correlation	,281**	1	,344**	,197**	,247**	,160**	,266**	,227**	,233**	,250**	,224**	,286**	,172**	,221**	,170**	,219**	,232**	,269**	,223**	,225**	,233**
	Sig. (2-tailed)	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
	N	514	520	513	514	515	515	519	516	513	511	517	514	514	516	513	512	513	516	513	510	512
impt_03	Pearson Correlation	,209**	,344**	1	,199**	,207**	,174**	,275**	,182**	,251**	,330**	,266**	,211**	,211**	,206**	,253**	,252**	,147**	,243**	,132**	,264**	,210**
	Sig. (2-tailed)	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,001	,000	,003	,000	,000
	N	511	513	519	512	514	512	517	513	511	509	513	513	512	514	510	509	511	515	511	509	510
impt_04	Pearson Correlation	,118**	,197**	,199**	1	,351**	,243**	,127**	,151**	,089*	,175**	,154**	,194**	,228**	,126**	,132**	,199**	,247**	,125**	,220**	,191**	,180**
	Sig. (2-tailed)	,007	,000	,000		,000	,000	,004	,001	,045	,000	,000	,000	,000	,004	,003	,000	,000	,005	,000	,000	,000
	N	511	514	512	517	514	514	516	513	510	508	512	512	512	513	509	508	511	513	510	508	509
impt_05	Pearson Correlation	,229**	,247**	,207**	,351**	1	,420**	,247**	,301**	,130**	,245**	,225**	,244**	,257**	,200**	,197**	,184**	,208**	,162**	,253**	,197**	,231**
	Sig. (2-tailed)	,000	,000	,000	,000		,000	,000	,000	,003	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
	N	513	515	514	514	519	515	518	515	512	510	514	513	514	515	511	510	512	515	512	509	511
impt_06	Pearson Correlation	,217**	,160**	,174**	,243**	,420**	1	,290**	,349**	,168**	,285**	,203**	,270**	,218**	,221**	,200**	,262**	,179**	,094*	,263**	,229**	,248**
	Sig. (2-tailed)	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,033	,000	,000	,000
	N	513	515	512	514	515	519	518	515	513	511	514	512	513	515	510	510	513	515	512	509	511
impt_07	Pearson Correlation	,194**	,266**	,275**	,127**	,247**	,290**	1	,443**	,268**	,290**	,255**	,181**	,153**	,246**	,272**	,252**	,128**	,239**	,201**	,242**	,178**
	Sig. (2-tailed)	,000	,000	,000	,004	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,004	,000	,000	,000	,000
	N	517	519	517	516	518	518	525	519	517	515	519	516	517	519	515	514	516	521	516	514	515
impt_08	Pearson Correlation	,177**	,227**	,182**	,151**	,301**	,349**	,443**	1	,322**	,331**	,294**	,208**	,167**	,234**	,245**	,203**	,126**	,117**	,262**	,193**	,235**
	Sig. (2-tailed)	,000	,000	,000	,001	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,004	,007	,000	,000	,000
	N	514	516	513	513	515	515	519	520	513	512	516	514	514	516	511	512	514	517	514	511	513
impt_09	Pearson Correlation	,112*	,233**	,251**	,089*	,130**	,168**	,268**	,322**	1	,298**	,292**	,130**	,133**	,262**	,248**	,181**	,162**	,348**	,157**	,168**	,218**
	Sig. (2-tailed)	,011	,000	,000	,045	,003	,000	,000	,000		,000	,000	,003	,003	,000	,000	,000	,000	,000	,000	,000	,000
	N	511	513	511	510	512	513	517	513	520	511	514	511	512	514	511	510	511	516	511	510	512
impt_10	Pearson Correlation	,178**	,250**	,330**	,175**	,245**	,285**	,290**	,331**	,298**	1	,351**	,314**	,221**	,463**	,237**	,315**	,171**	,214**	,213**	,246**	,222**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000
	N	509	511	509	508	510	511	515	512	511	516	512	509	509	511	507	506	508	512	508	506	507
impt_11	Pearson Correlation	,139**	,224**	,266**	,154**	,225**	,203**	,255**	,294**	,292**	,351**	1	,283**	,303**	,233**	,168**	,177**	,108*	,206**	,183**	,152**	,110*
	Sig. (2-tailed)	,002	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,015	,000	,000	,001	,013
	N	513	517	513	512	514	514	519	516	514	512	521	515	514	516	514	512	513	517	513	511	512
impt_12	Pearson Correlation	,212**	,286**	,211**	,194**	,244**	,270**	,181**	,208**	,130**	,314**	,283**	1	,423**	,303**	,160**	,230**	,341**	,160**	,256**	,251**	,245**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	,003	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000
	N	512	514	513	512	513	512	516	514	511	509	515	518	512	515	512	509	512	514	511	509	510
impt_13	Pearson Correlation	,137**	,172**	,211**	,228**	,257**	,218**	,153**	,167**	,133**	,221**	,303**	,423**	1	,265**	,251**	,251**	,264**	,162**	,197**	,222**	,224**
	Sig. (2-tailed)	,002	,000	,000	,000	,000	,000	,000	,000	,003	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000	,000
	N	512	514	512	512	514	513	517	514	512	509	514	512	519	515	510	510	512	515	512	509	511
impt_14	Pearson Correlation	,121**	,221**	,206**	,126**	,200**	,221**	,246**	,234**	,262**	,463**	,233**	,303**	,265**	1	,272**	,215**	,162**	,165**	,209**	,192**	,156**
	Sig. (2-tailed)	,006	,000	,000	,004	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000	,000
	N	515	516	514	513	515	515	519	516	514	511	516	515	515	521	513	512	515	517	514	511	514
impt_15	Pearson Correlation	,137**	,170**	,253**	,132**	,197**	,200**	,272**	,245**	,248**	,237**	,168**	,160**	,251**	,272**	1	,357**	,193**	,215**	,230**	,179**	,201**
	Sig. (2-tailed)	,002	,000	,000	,003	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000	,000
	N	511	513	510	509	511	510	515	511	511	507	514	512	510	513	518	508	510	514	509	508	508
impt_16	Pearson Correlation	,239**	,219**	,252**	,199**	,184**	,262**	,252**	,203**	,181**	,315**	,177**	,230**	,251**	,215**	,357**	1	,272**	,180**	,220**	,272**	,269**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000	,000	,000
	N	509	512	509	508	510	510	514	512	510	506	512	509	510	512	508	516	510	513	510	507	510
impt_17	Pearson Correlation	,146**	,232**	,147**	,247**	,208**	,179**	,128**	,126**	,162**	,171**	,108*	,341**	,264**	,162**	,193**	,272**	1	,185**	,319**	,200**	,291**
	Sig. (2-tailed)	,001	,000	,001	,000	,000	,000	,004	,004	,000	,000	,015	,000	,000	,000	,000	,000		,000	,000	,000	,000
	N	512	513	511	511	512	513	516	514	511	508	513	512	512	515	510	510	518	517	515	513	513
impt_18	Pearson Correlation	,171**	,269**	,243**	,125**	,162**	,094*	,239**	,117**	,348**	,214**	,206**	,160**	,162**	,165**	,215**	,180**	,185**	1	,244**	,295**	,294**
	Sig. (2-tailed)	,000	,000	,000	,005	,000	,033	,000	,007	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000	,000
	N	514	516	515	513	515	515	521	517	516	512	517	514	515	517	514	513	517	524	517	516	516
impt_19	Pearson Correlation	,087	,223**	,132**	,220**	,253**	,263**	,201**	,262**	,157**	,213**	,183**	,256**	,197**	,209**	,230**	,220**	,319**	,244**	1	,392**	,387**
	Sig. (2-tailed)	,050	,000	,003	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000		,000	,000
	N	511	513	511	510	512	512	516	514	511	508	513	511	512	514	509	510	515	517	518	512	513
impt_20	Pearson Correlation	,167**	,225**	,264**	,191**	,197**	,229**	,242**	,193**	,168**	,246**	,152**	,251**	,222**	,192**	,179**	,272**	,200**	,295**	,392**	1	,441**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,001	,000	,000	,000	,000	,000	,000	,000	,000		,000
	N	508	510	509	508	509	509	514	511	510	506	511	509	509	511	508	507	513	516	512	517	510
impt_21	Pearson Correlation	,108*	,233**	,210**	,180**	,231**	,248**	,178**	,235**	,218**	,222**	,110*	,245**	,224**	,156**	,201**	,269**	,291**	,294**	,387**	,441**	1
	Sig. (2-tailed)	,015	,000	,000	,000	,000	,000	,000	,000	,000	,000	,013	,000	,000	,000	,000	,000	,000	,000	,000	,000	
	N	510	512	510	509	511	511	515	513	512	507	512	510	511	514	508	510	513	516	513	510	517

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX 04 – CORRELATION MATRIX FOR PRCT VARIABLES

		prct_01	prct_02	prct_03	prct_04	prct_05	prct_06	prct_07	prct_08	prct_09	prct_10	prct_11	prct_12	prct_13	prct_14	prct_15	prct_16	prct_17	prct_18	prct_19	prct_20	prct_21
prct_01	Pearson Correlation	1	,997**	,995**	,996**	,996**	,997**	,996**	,996**	,995**	,996**	,995**	,996**	,995**	,996**	,995**	,995**	,996**	,995**	,995**	,994**	,995**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_02	Pearson Correlation	,997**	1	,996**	,995**	,996**	,996**	,996**	,995**	,996**	,996**	,995**	,995**	,995**	,996**	,994**	,994**	,995**	,996**	,995**	,995**	,996**
	Sig. (2-tailed)	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_03	Pearson Correlation	,995**	,996**	1	,995**	,995**	,994**	,994**	,995**	,994**	,995**	,994**	,994**	,994**	,995**	,993**	,994**	,994**	,994**	,994**	,995**	,995**
	Sig. (2-tailed)	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_04	Pearson Correlation	,996**	,995**	,995**	1	,997**	,996**	,996**	,996**	,995**	,996**	,995**	,996**	,995**	,996**	,995**	,995**	,996**	,995**	,995**	,995**	,995**
	Sig. (2-tailed)	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_05	Pearson Correlation	,996**	,996**	,995**	,997**	1	,997**	,997**	,997**	,995**	,996**	,995**	,996**	,995**	,996**	,994**	,994**	,996**	,995**	,996**	,995**	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_06	Pearson Correlation	,997**	,996**	,994**	,996**	,997**	1	,997**	,997**	,995**	,997**	,995**	,996**	,996**	,997**	,995**	,995**	,996**	,996**	,996**	,995**	,995**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_07	Pearson Correlation	,996**	,996**	,994**	,996**	,997**	,997**	1	,998**	,996**	,997**	,995**	,996**	,996**	,997**	,995**	,995**	,996**	,996**	,996**	,995**	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_08	Pearson Correlation	,996**	,995**	,995**	,996**	,997**	,997**	,998**	1	,996**	,997**	,996**	,996**	,996**	,997**	,995**	,995**	,996**	,996**	,996**	,995**	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_09	Pearson Correlation	,995**	,996**	,994**	,995**	,995**	,995**	,996**	,996**	1	,996**	,995**	,995**	,995**	,996**	,994**	,993**	,995**	,996**	,996**	,995**	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_10	Pearson Correlation	,996**	,996**	,995**	,996**	,996**	,997**	,997**	,997**	,996**	1	,996**	,996**	,995**	,998**	,995**	,996**	,996**	,996**	,996**	,996**	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	397	397	397	397	397	397	397	397	397	397	397	397	397	397	396	396	397	397	397	397	397
prct_11	Pearson Correlation	,995**	,995**	,994**	,995**	,995**	,995**	,995**	,996**	,995**	,996**	1	,996**	,996**	,996**	,994**	,994**	,996**	,995**	,995**	,995**	,995**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_12	Pearson Correlation	,996**	,995**	,994**	,996**	,996**	,996**	,996**	,996**	,995**	,996**	,996**	1	,996**	,996**	,996**	,995**	,996**	,995**	,995**	,994**	,995**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_13	Pearson Correlation	,995**	,995**	,994**	,995**	,995**	,996**	,996**	,996**	,995**	,995**	,996**	,996**	1	,996**	,995**	,994**	,997**	,995**	,995**	,994**	,995**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_14	Pearson Correlation	,996**	,996**	,995**	,996**	,996**	,997**	,997**	,997**	,996**	,998**	,996**	,996**	,996**	1	,996**	,996**	,996**	,996**	,996**	,995**	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_15	Pearson Correlation	,995**	,994**	,993**	,995**	,994**	,995**	,995**	,995**	,994**	,995**	,994**	,996**	,995**	,996**	1	,996**	,995**	,994**	,994**	,993**	,994**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000	0,000
	N	397	397	397	397	397	397	397	397	397	396	397	397	397	397	397	396	397	397	397	397	397
prct_16	Pearson Correlation	,995**	,994**	,994**	,995**	,994**	,995**	,995**	,995**	,993**	,996**	,994**	,995**	,994**	,996**	,996**	1	,994**	,994**	,994**	,994**	,994**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000	0,000
	N	397	397	397	397	397	397	397	397	397	396	397	397	397	397	396	397	397	397	397	397	397
prct_17	Pearson Correlation	,996**	,995**	,994**	,996**	,996**	,996**	,996**	,996**	,995**	,996**	,996**	,996**	,997**	,996**	,995**	,994**	1	,997**	,996**	,994**	,995**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_18	Pearson Correlation	,995**	,996**	,994**	,995**	,995**	,996**	,996**	,996**	,996**	,996**	,995**	,995**	,995**	,996**	,994**	,994**	,997**	1	,997**	,996**	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_19	Pearson Correlation	,995**	,995**	,994**	,995**	,996**	,996**	,996**	,996**	,996**	,996**	,995**	,995**	,995**	,996**	,994**	,994**	,996**	,997**	1	,997**	,997**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000	0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_20	Pearson Correlation	,994**	,995**	,995**	,995**	,995**	,995**	,995**	,995**	,995**	,996**	,995**	,994**	,994**	,995**	,993**	,994**	,994**	,996**	,997**	1	,996**
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000		0,000
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398
prct_21	Pearson Correlation	,995**	,996**	,995**	,995**	,996**	,995**	,996**	,996**	,996**	,996**	,995**	,995**	,995**	,996**	,994**	,994**	,995**	,996**	,997**	,996**	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	
	N	398	398	398	398	398	398	398	398	398	397	398	398	398	398	397	397	398	398	398	398	398

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX 05 – STATISTICS FOR VARIABLE IMPT_01

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_01	518	98,1%	10	1,9%	528	100,0%

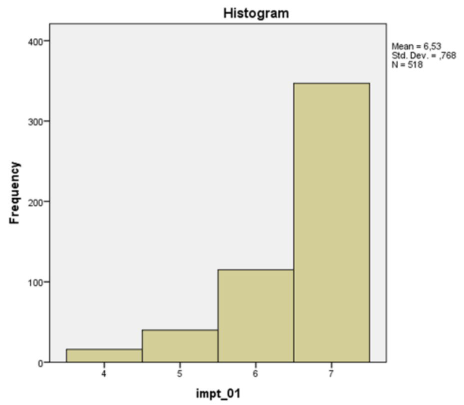
Descriptives

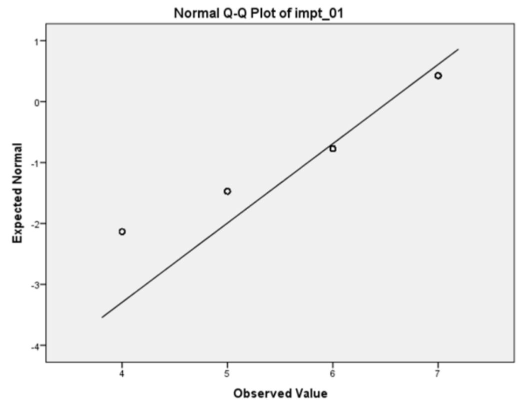
			Statistic	Std. Error
impt_01	Mean		6,53	,034
	95% Confidence Interval for Mean	Lower Bound	6,46	
		Upper Bound	6,60	
	5% Trimmed Mean		6,62	
	Median		7,00	
	Variance		,590	
	Std. Deviation		,768	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		1	
	Skewness		-1,647	,107
	Kurtosis		2,054	,214

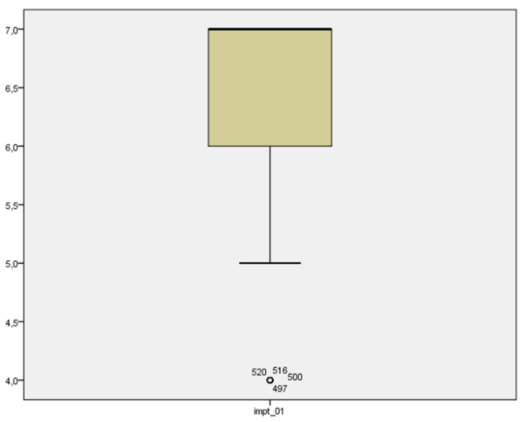
Tests of Normality

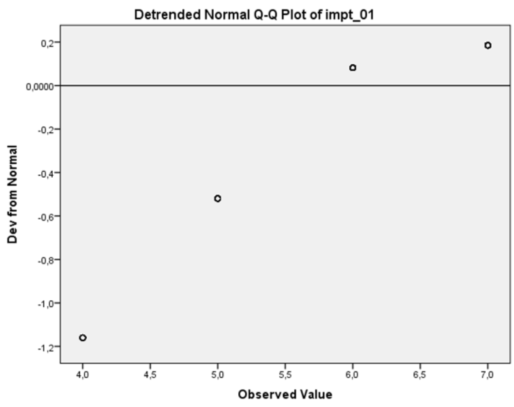
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_01	,399	518	,000	,648	518	,000

a. Lilliefors Significance Correction









APPENDIX 06 – STATISTICS FOR VARIABLE IMPT_02

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_02	520	98,5%	8	1,5%	528	100,0%

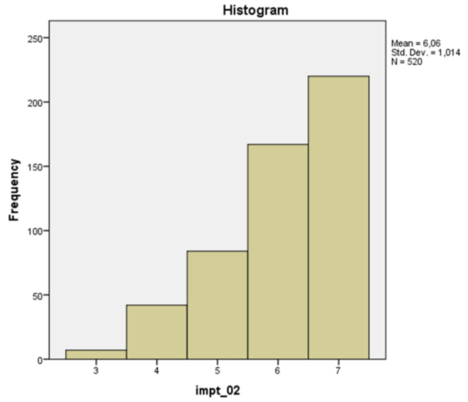
Descriptives

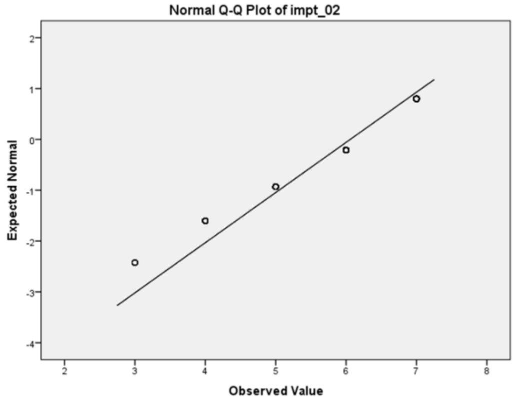
			Statistic	Std. Error
impt_02	Mean		6,06	,044
	95% Confidence Interval for Mean	Lower Bound	5,97	
		Upper Bound	6,15	
	5% Trimmed Mean		6,14	
	Median		6,00	
	Variance		1,027	
	Std. Deviation		1,014	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		2	
	Skewness		-,900	,107
	Kurtosis		,025	,214

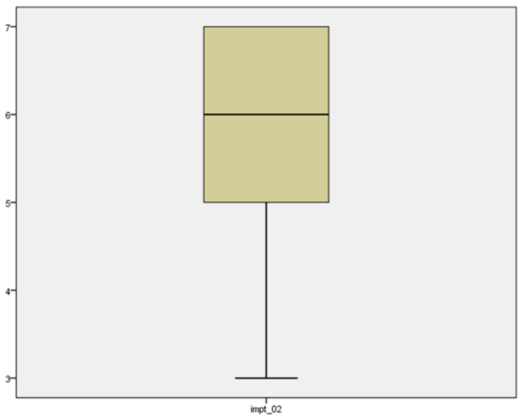
Tests of Normality

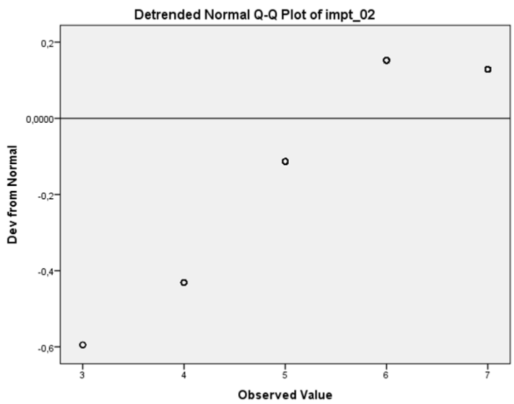
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_02	,246	520	,000	,818	520	,000

a. Lilliefors Significance Correction









APPENDIX 07 – STATISTICS FOR VARIABLE IMPT_03

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_03	519	98,3%	9	1,7%	528	100,0%

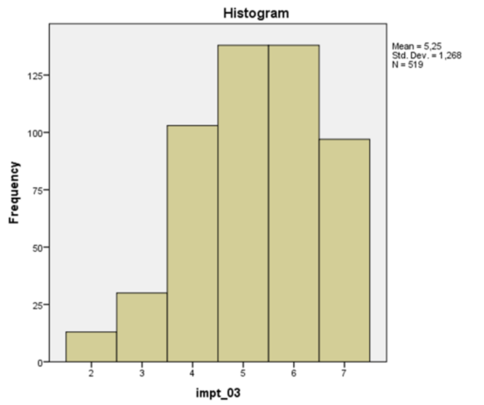
Descriptives

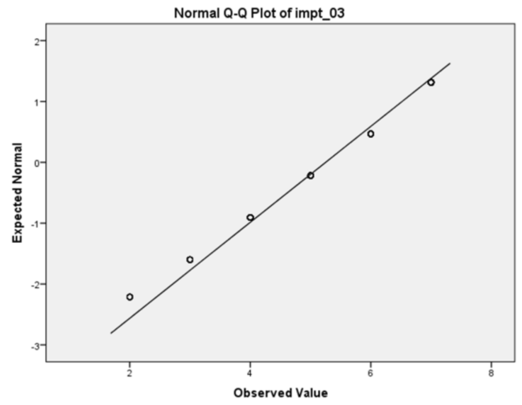
			Statistic	Std. Error
impt_03	Mean		5,25	,056
	95% Confidence Interval for Mean	Lower Bound	5,14	
		Upper Bound	5,36	
	5% Trimmed Mean		5,31	
	Median		5,00	
	Variance		1,609	
	Std. Deviation		1,268	
	Minimum		2	
	Maximum		7	
	Range		5	
	Interquartile Range		2	
	Skewness		-,394	,107
	Kurtosis		-,433	,214

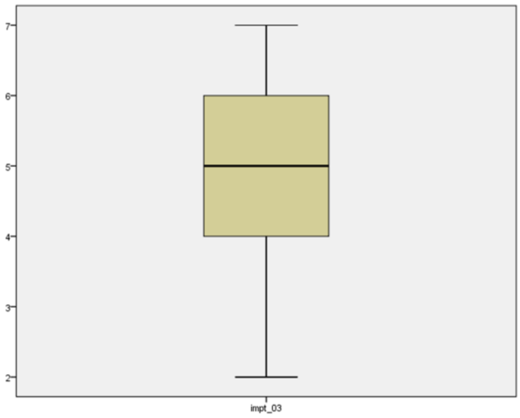
Tests of Normality

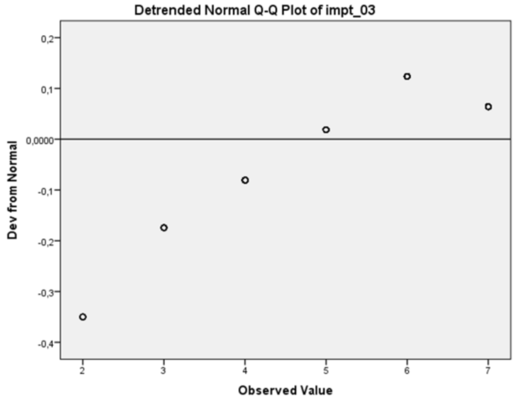
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_03	,175	519	,000	,917	519	,000

a. Lilliefors Significance Correction









APPENDIX 08 – STATISTICS FOR VARIABLE IMPT_04

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_04	517	97,9%	11	2,1%	528	100,0%

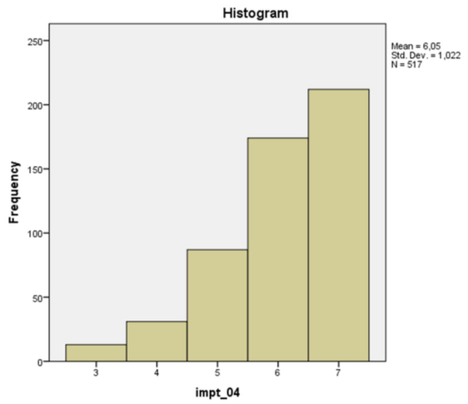
Descriptives

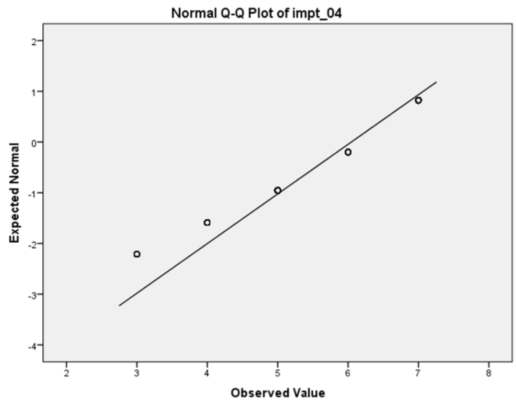
			Statistic	Std. Error
impt_04	Mean		6,05	,045
	95% Confidence Interval for Mean	Lower Bound	5,96	
		Upper Bound	6,13	
	5% Trimmed Mean		6,14	
	Median		6,00	
	Variance		1,044	
	Std. Deviation		1,022	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		2	
	Skewness		-1,001	,107
	Kurtosis		,475	,214

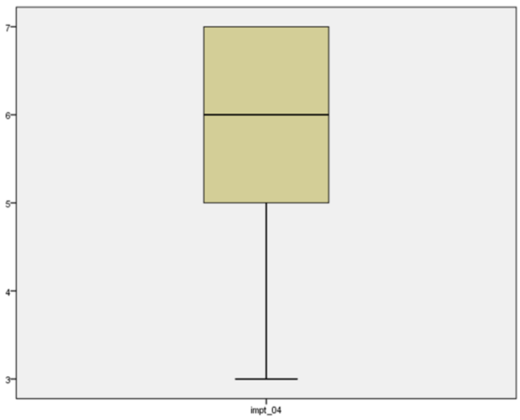
Tests of Normality

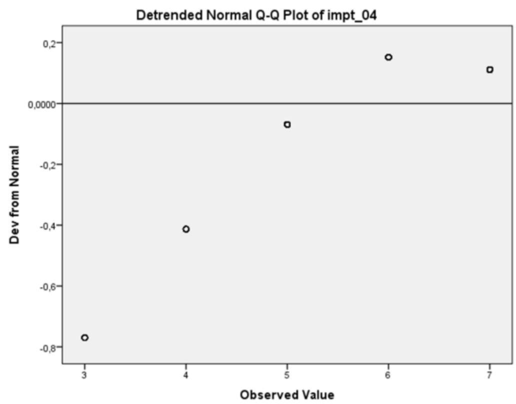
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_04	,235	517	,000	,818	517	,000

a. Lilliefors Significance Correction









APPENDIX 09 – STATISTICS FOR VARIABLE IMPT_05

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_05	519	98,3%	9	1,7%	528	100,0%

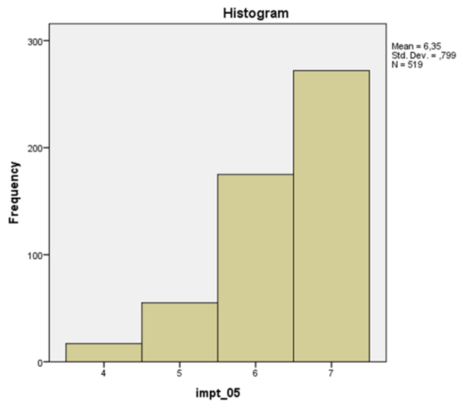
Descriptives

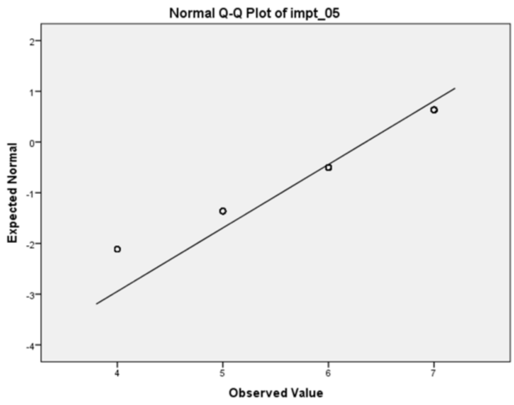
			Statistic	Std. Error
impt_05	Mean		6,35	,035
	95% Confidence Interval for Mean	Lower Bound	6,28	
		Upper Bound	6,42	
	5% Trimmed Mean		6,43	
	Median		7,00	
	Variance		,638	
	Std. Deviation		,799	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		1	
	Skewness		-1,108	,107
	Kurtosis		,607	,214

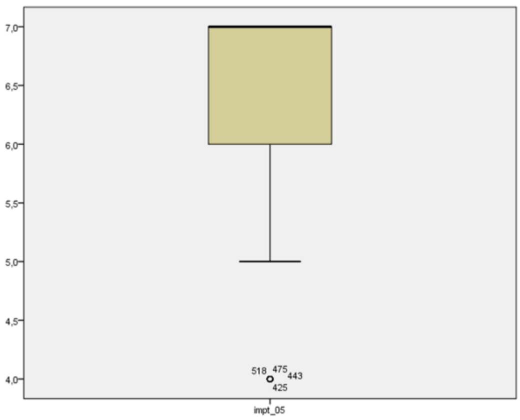
Tests of Normality

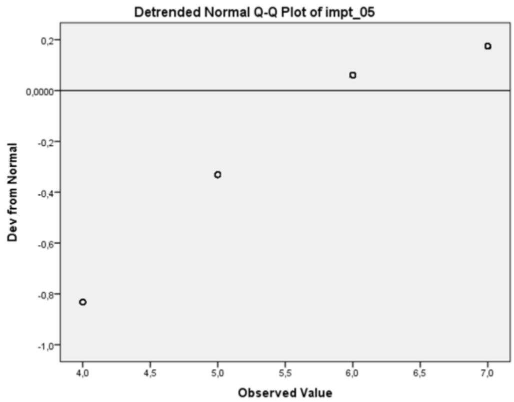
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_05	,315	519	,000	,753	519	,000

a. Lilliefors Significance Correction









APPENDIX 10 – STATISTICS FOR VARIABLE IMPT_06

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_06	519	98,3%	9	1,7%	528	100,0%

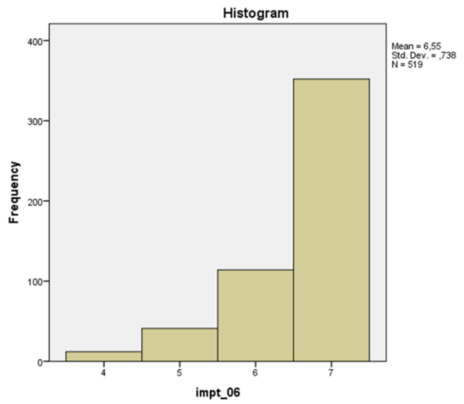
Descriptives

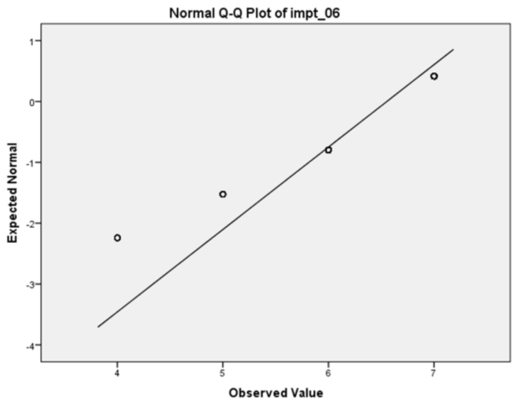
			Statistic	Std. Error
impt_06	Mean		6,55	,032
	95% Confidence Interval for Mean	Lower Bound	6,49	
		Upper Bound	6,62	
	5% Trimmed Mean		6,64	
	Median		7,00	
	Variance		,545	
	Std. Deviation		,738	
	Minimum		4	
	Maximum		7	
	Range		3	
	Interquartile Range		1	
	Skewness		-1,643	,107
	Kurtosis		2,066	,214

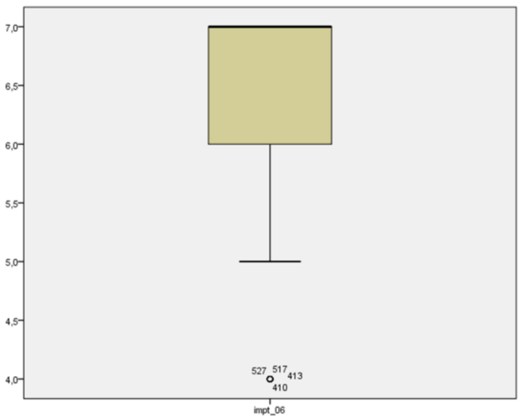
Tests of Normality

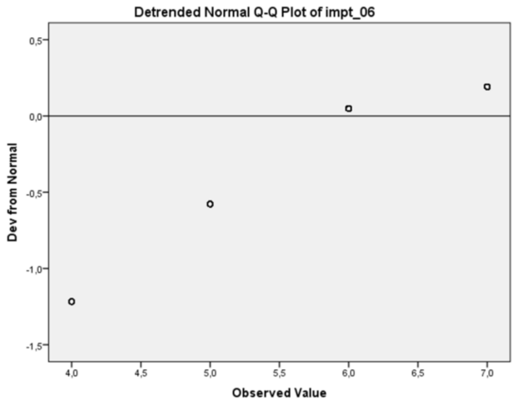
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_06	,406	519	,000	,643	519	,000

a. Lilliefors Significance Correction









APPENDIX 11 – STATISTICS FOR VARIABLE IMPT_07

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_07	525	99,4%	3	,6%	528	100,0%

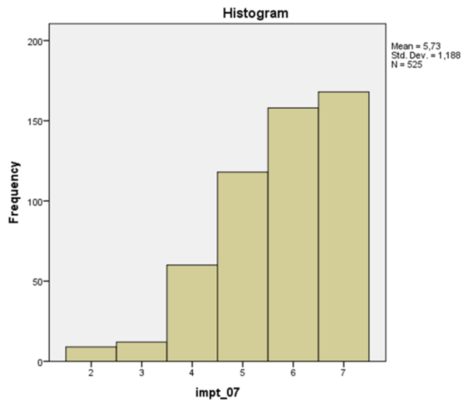
Descriptives

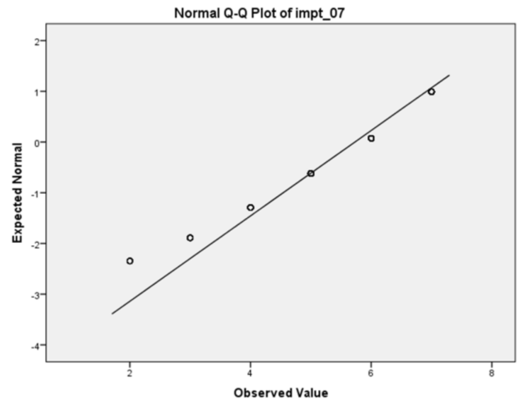
			Statistic	Std. Error
impt_07	Mean		5,73	,052
	95% Confidence Interval for Mean	Lower Bound	5,63	
		Upper Bound	5,83	
	5% Trimmed Mean		5,82	
	Median		6,00	
	Variance		1,411	
	Std. Deviation		1,188	
	Minimum		2	
	Maximum		7	
	Range		5	
	Interquartile Range		2	
	Skewness		-,822	,107
	Kurtosis		,293	,213

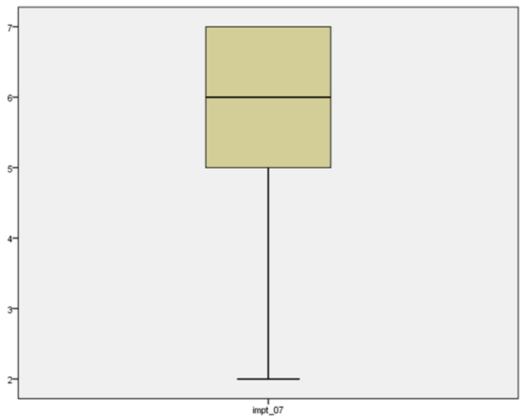
Tests of Normality

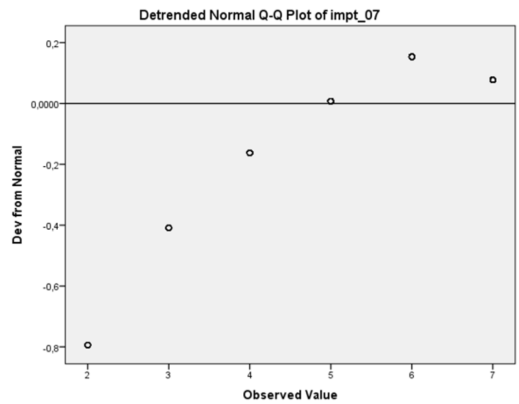
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_07	,211	525	,000	,865	525	,000

a. Lilliefors Significance Correction









APPENDIX 12 – STATISTICS FOR VARIABLE IMPT_08

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_08	520	98,5%	8	1,5%	528	100,0%

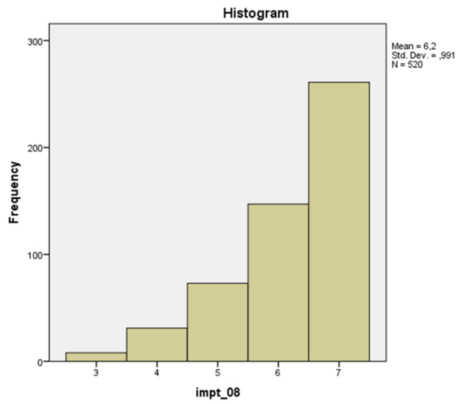
Descriptives

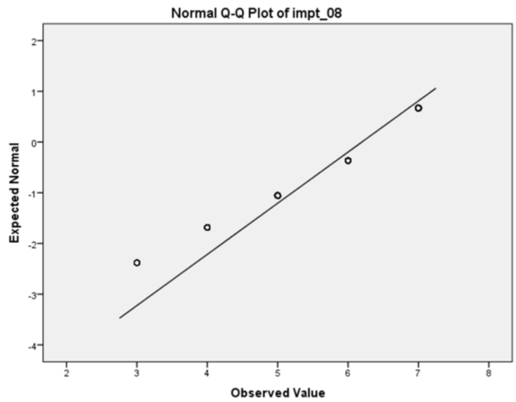
			Statistic	Std. Error
impt_08	Mean		6,20	,043
	95% Confidence Interval for Mean	Lower Bound	6,11	
		Upper Bound	6,28	
	5% Trimmed Mean		6,29	
	Median		7,00	
	Variance		,983	
	Std. Deviation		,991	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		1	
	Skewness		-1,152	,107
	Kurtosis		,646	,214

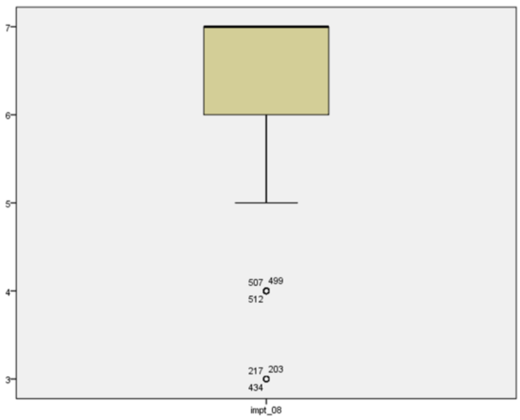
Tests of Normality

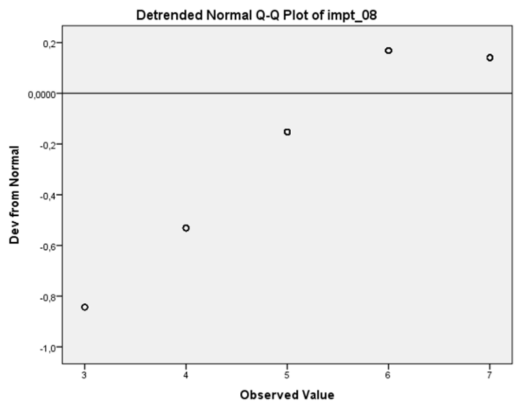
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_08	,293	520	,000	,775	520	,000

a. Lilliefors Significance Correction









APPENDIX 13 – STATISTICS FOR VARIABLE IMPT_09

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_09	520	98,5%	8	1,5%	528	100,0%

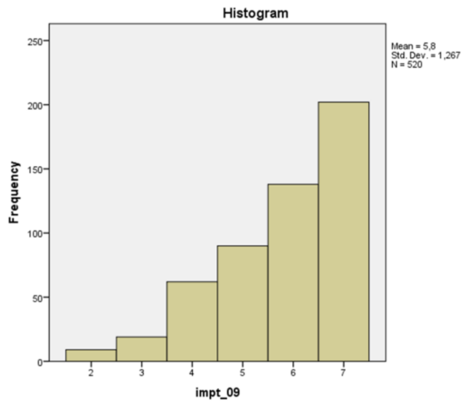
Descriptives

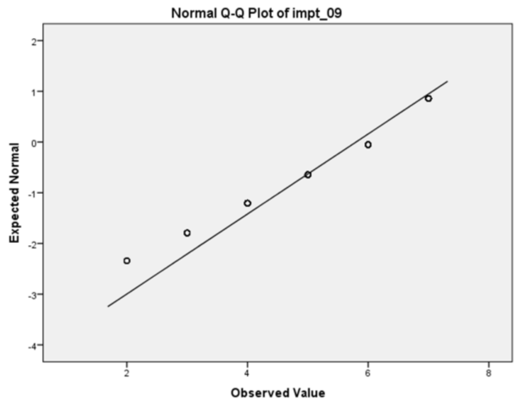
				Statistic	Std. Error
impt_09	Mean			5,80	,056
	95% Confidence Interval for Mean	Lower Bound		5,69	
		Upper Bound		5,91	
	5% Trimmed Mean			5,91	
	Median			6,00	
	Variance			1,607	
	Std. Deviation			1,267	
	Minimum			2	
	Maximum			7	
	Range			5	
	Interquartile Range			2	
	Skewness			-,915	,107
	Kurtosis			,112	,214

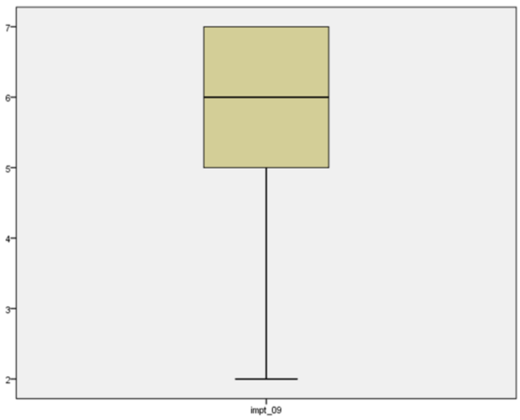
Tests of Normality

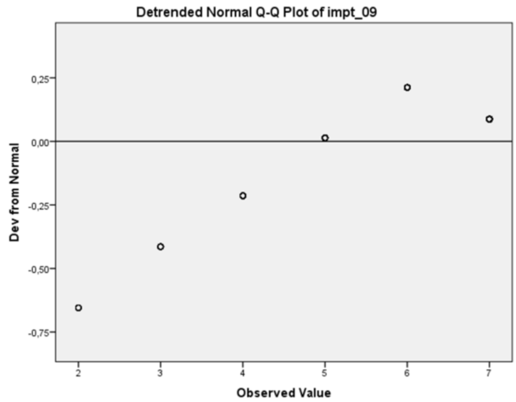
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_09	,217	520	,000	,840	520	,000

a. Lilliefors Significance Correction









APPENDIX 14 – STATISTICS FOR VARIABLE IMPT_10

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_10	516	97,7%	12	2,3%	528	100,0%

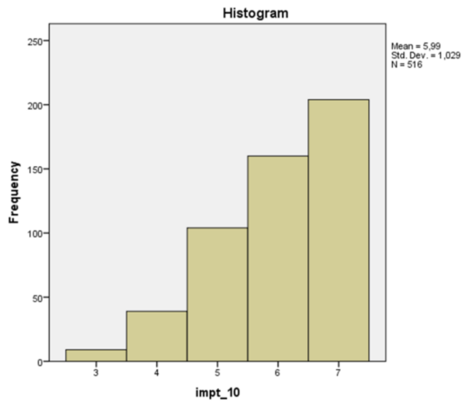
Descriptives

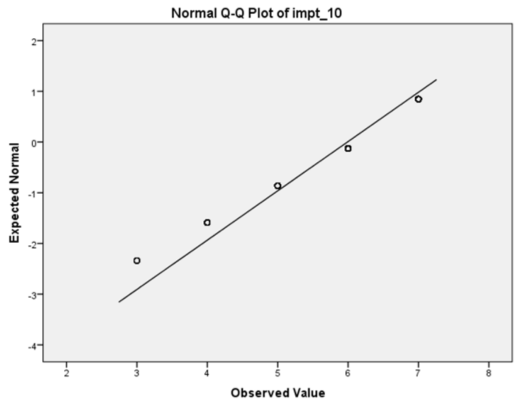
			Statistic	Std. Error
impt_10	Mean		5,99	,045
	95% Confidence Interval for Mean	Lower Bound	5,90	
		Upper Bound	6,08	
	5% Trimmed Mean		6,06	
	Median		6,00	
	Variance		1,058	
	Std. Deviation		1,029	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		2	
	Skewness		-,786	,108
	Kurtosis		-,134	,215

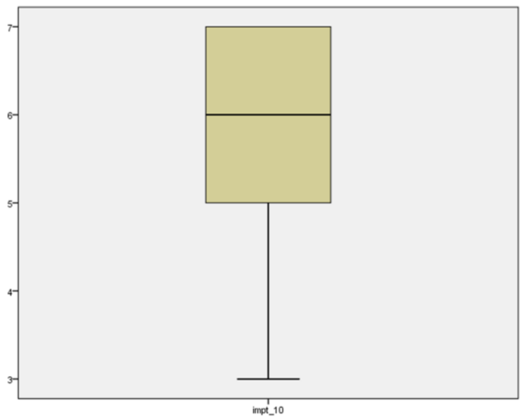
Tests of Normality

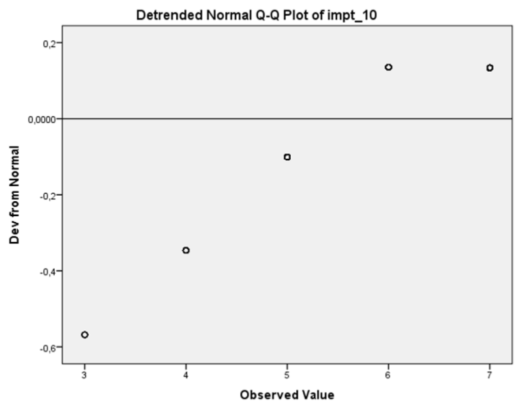
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_10	,232	516	,000	,836	516	,000

a. Lilliefors Significance Correction









APPENDIX 15 – STATISTICS FOR VARIABLE IMPT_11

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_11	521	98,7%	7	1,3%	528	100,0%

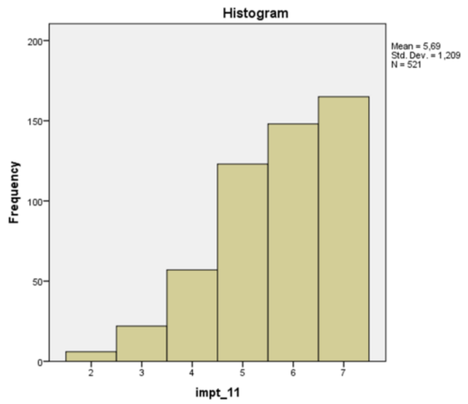
Descriptives

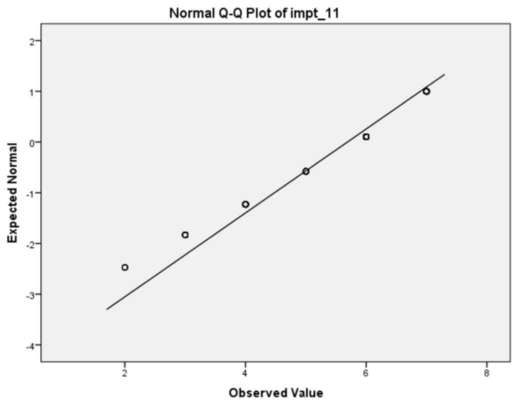
			Statistic	Std. Error
impt_11	Mean		5,69	,053
	95% Confidence Interval for Mean	Lower Bound	5,59	
		Upper Bound	5,79	
	5% Trimmed Mean		5,78	
	Median		6,00	
	Variance		1,461	
	Std. Deviation		1,209	
	Minimum		2	
	Maximum		7	
	Range		5	
	Interquartile Range		2	
	Skewness		-,730	,107
	Kurtosis		-,062	,214

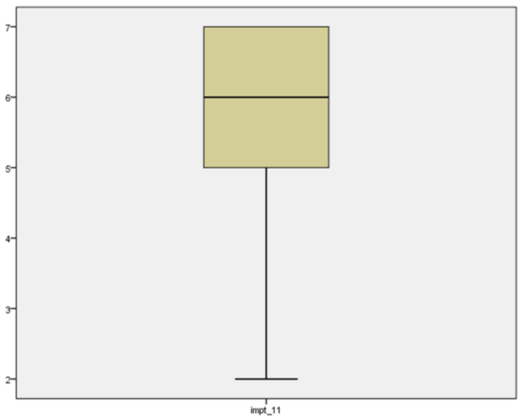
Tests of Normality

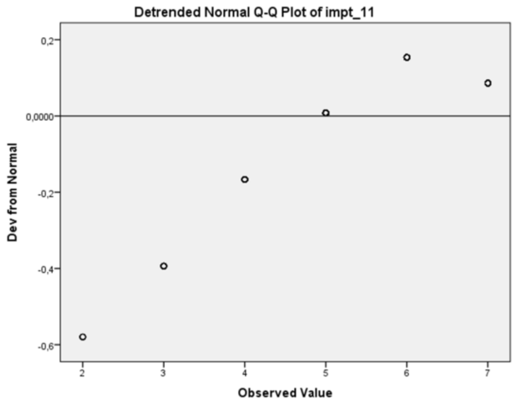
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_11	,202	521	,000	,873	521	,000

a. Lilliefors Significance Correction









APPENDIX 16 – STATISTICS FOR VARIABLE IMPT_12

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_12	518	98,1%	10	1,9%	528	100,0%

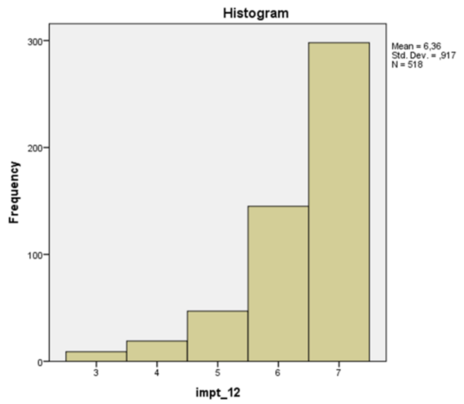
Descriptives

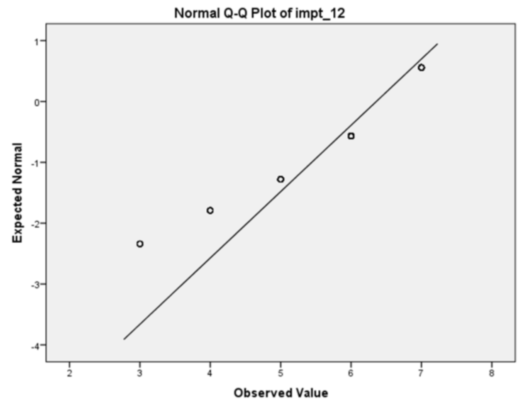
			Statistic	Std. Error
impt_12	Mean		6,36	,040
	95% Confidence Interval for Mean	Lower Bound	6,28	
		Upper Bound	6,44	
	5% Trimmed Mean		6,47	
	Median		7,00	
	Variance		,842	
	Std. Deviation		,917	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		1	
	Skewness		-1,601	,107
	Kurtosis		2,360	,214

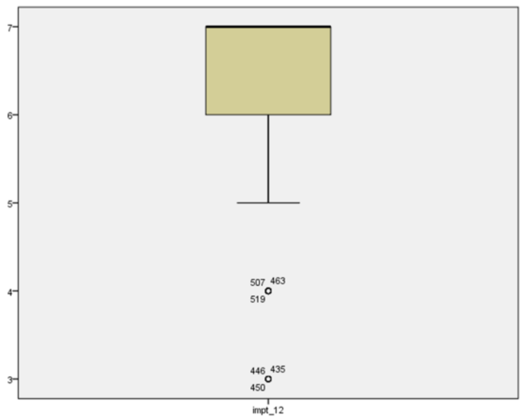
Tests of Normality

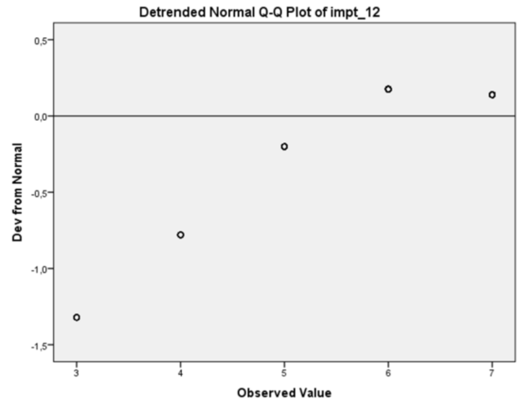
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_12	,333	518	,000	,710	518	,000

a. Lilliefors Significance Correction









APPENDIX 17 – STATISTICS FOR VARIABLE IMPT_13

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_13	519	98,3%	9	1,7%	528	100,0%

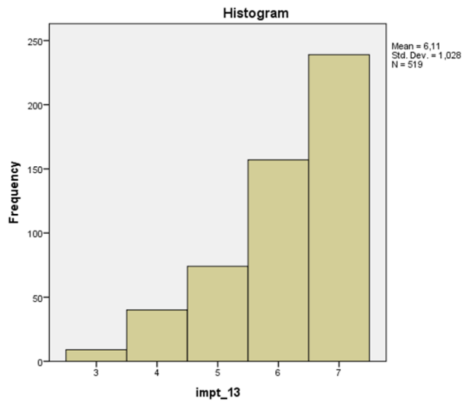
Descriptives

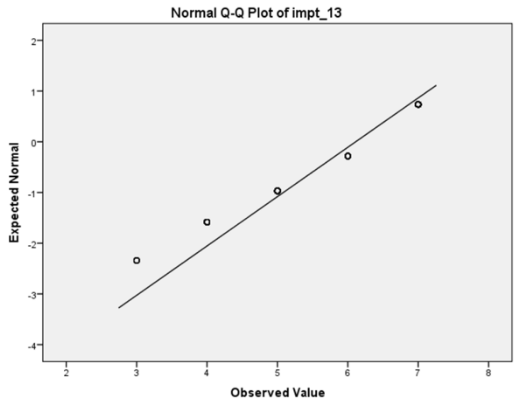
			Statistic	Std. Error
impt_13	Mean		6,11	,045
	95% Confidence Interval for Mean	Lower Bound	6,02	
		Upper Bound	6,20	
	5% Trimmed Mean		6,20	
	Median		6,00	
	Variance		1,057	
	Std. Deviation		1,028	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		1	
	Skewness		-1,038	,107
	Kurtosis		,306	,214

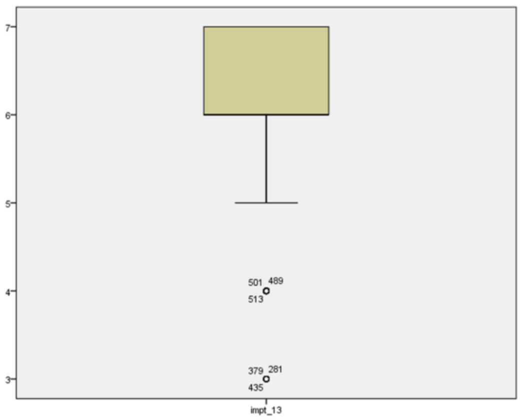
Tests of Normality

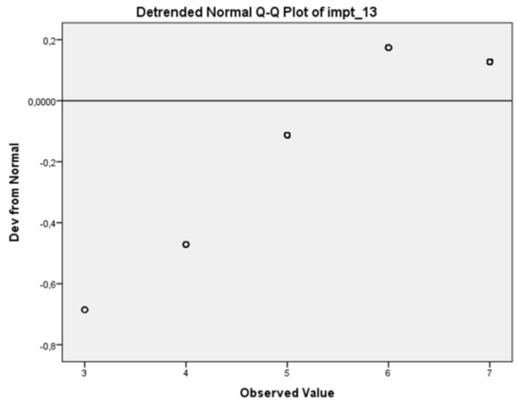
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_13	,267	519	,000	,797	519	,000

a. Lilliefors Significance Correction









APPENDIX 18 – STATISTICS FOR VARIABLE IMPT_14

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_14	521	98,7%	7	1,3%	528	100,0%

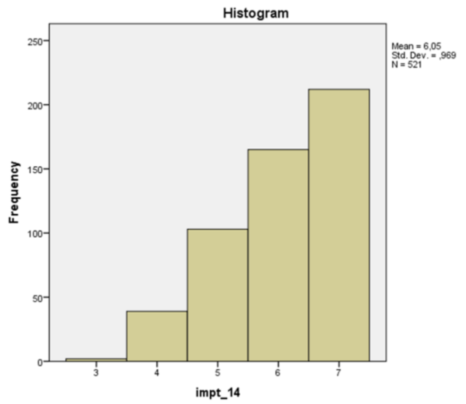
Descriptives

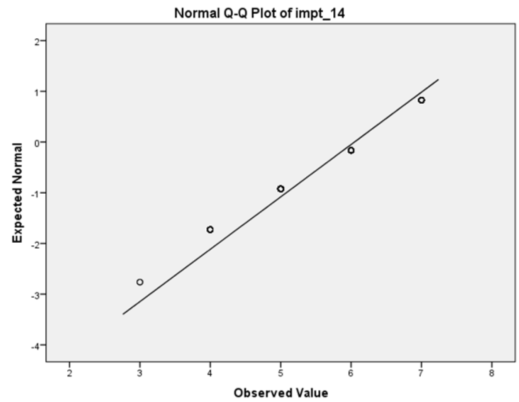
			Statistic	Std. Error
impt_14	Mean		6,05	,042
	95% Confidence Interval for Mean	Lower Bound	5,96	
		Upper Bound	6,13	
	5% Trimmed Mean		6,11	
	Median		6,00	
	Variance		,938	
	Std. Deviation		,969	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		2	
	Skewness		-,695	,107
	Kurtosis		-,459	,214

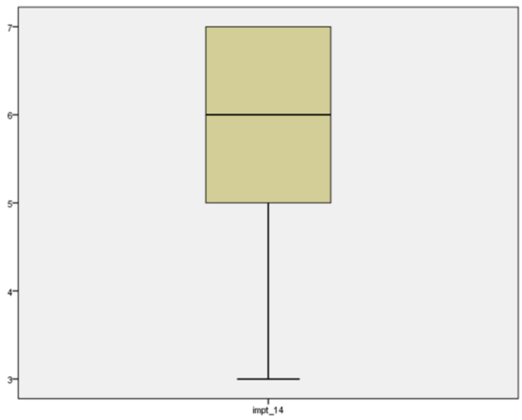
Tests of Normality

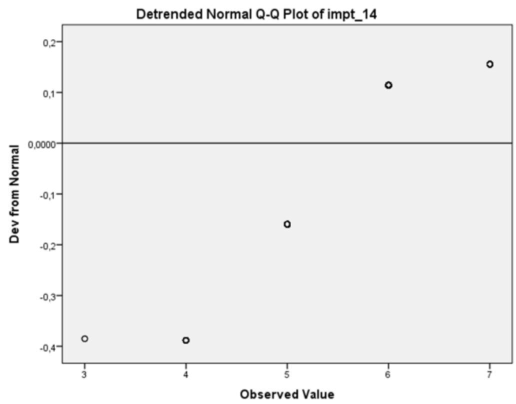
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_14	,244	521	,000	,829	521	,000

a. Lilliefors Significance Correction









APPENDIX 19 – STATISTICS FOR VARIABLE IMPT_15

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_15	518	98,1%	10	1,9%	528	100,0%

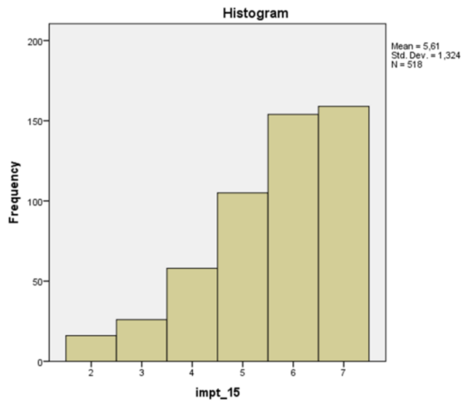
Descriptives

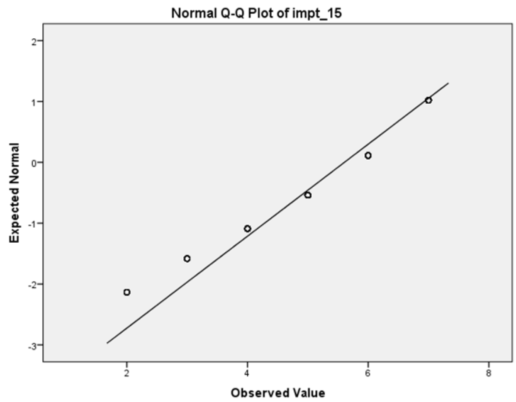
			Statistic	Std. Error
impt_15	Mean		5,61	,058
	95% Confidence Interval for Mean	Lower Bound	5,49	
		Upper Bound	5,72	
	5% Trimmed Mean		5,71	
	Median		6,00	
	Variance		1,752	
	Std. Deviation		1,324	
	Minimum		2	
	Maximum		7	
	Range		5	
	Interquartile Range		2	
	Skewness		-,866	,107
	Kurtosis		,113	,214

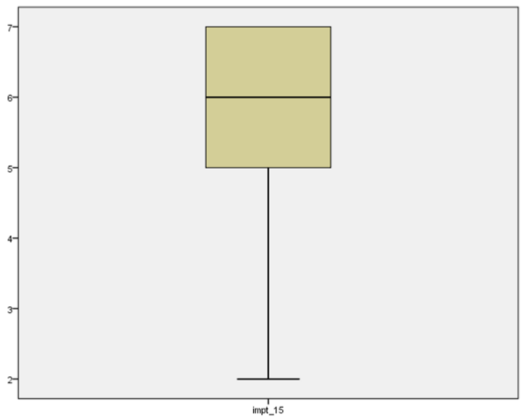
Tests of Normality

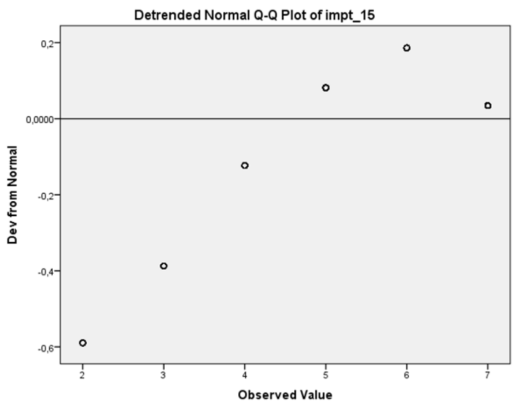
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_15	,221	518	,000	,866	518	,000

a. Lilliefors Significance Correction









APPENDIX 20 – STATISTICS FOR VARIABLE IMPT_16

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_16	516	97,7%	12	2,3%	528	100,0%

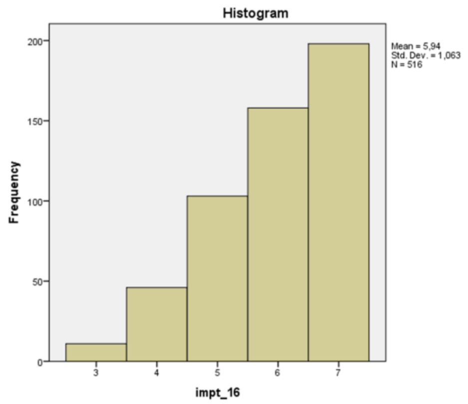
Descriptives

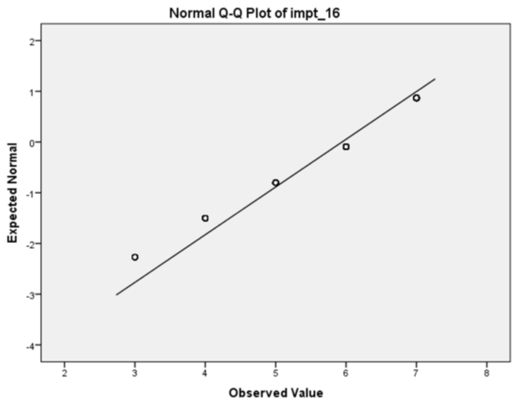
			Statistic	Std. Error
impt_16	Mean		5,94	,047
	95% Confidence Interval for Mean	Lower Bound	5,85	
		Upper Bound	6,03	
	5% Trimmed Mean		6,01	
	Median		6,00	
	Variance		1,131	
	Std. Deviation		1,063	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		2	
	Skewness		-,759	,108
	Kurtosis		-,240	,215

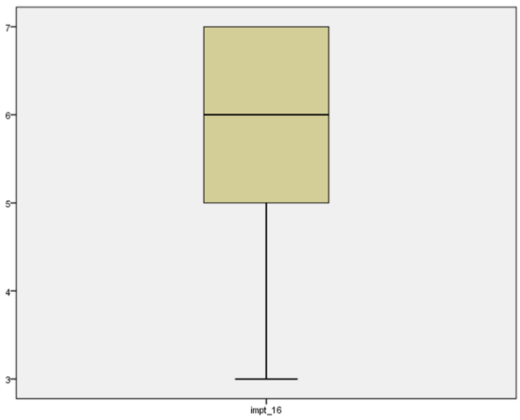
Tests of Normality

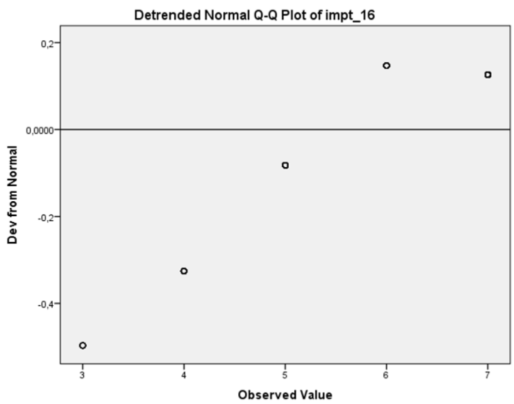
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_16	,224	516	,000	,841	516	,000

a. Lilliefors Significance Correction









APPENDIX 21 – STATISTICS FOR VARIABLE IMPT_17

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_17	518	98,1%	10	1,9%	528	100,0%

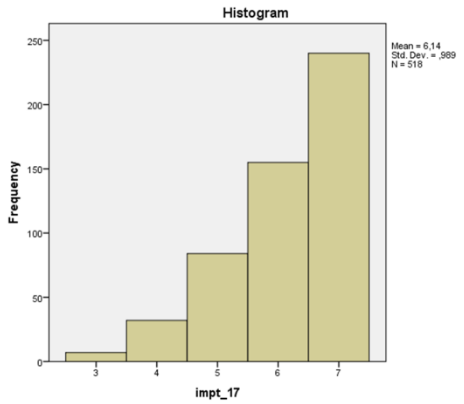
Descriptives

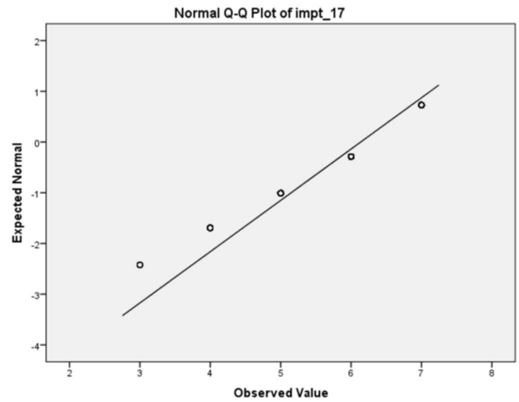
			Statistic	Std. Error
impt_17	Mean		6,14	,043
	95% Confidence Interval for Mean	Lower Bound	6,05	
		Upper Bound	6,22	
	5% Trimmed Mean		6,22	
	Median		6,00	
	Variance		,977	
	Std. Deviation		,989	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		1	
	Skewness		-1,001	,107
	Kurtosis		,299	,214

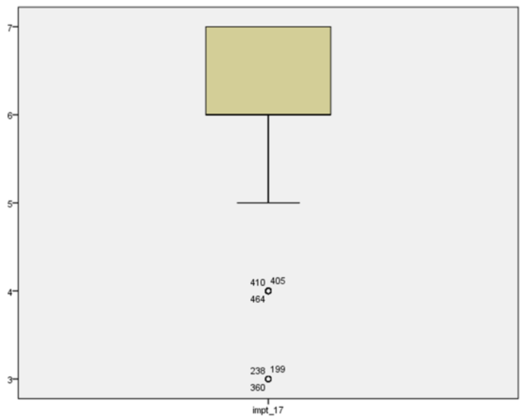
Tests of Normality

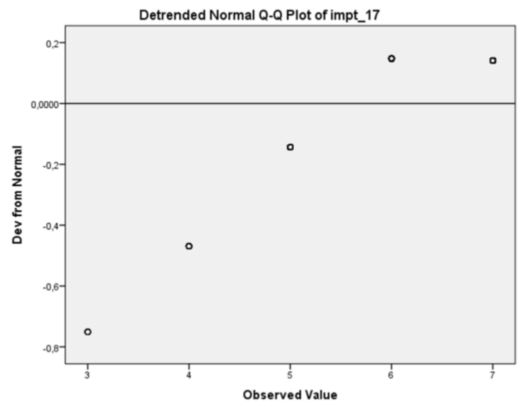
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_17	,272	518	,000	,799	518	,000

a. Lilliefors Significance Correction









APPENDIX 22 – STATISTICS FOR VARIABLE IMPT_18

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_18	524	99,2%	4	,8%	528	100,0%

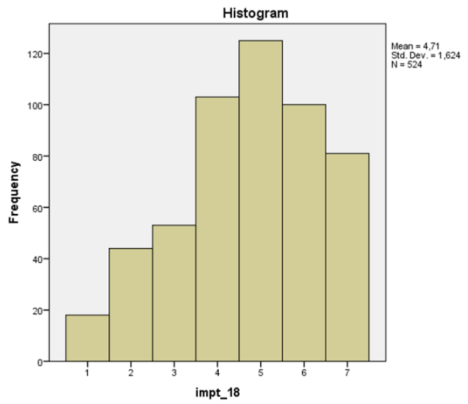
Descriptives

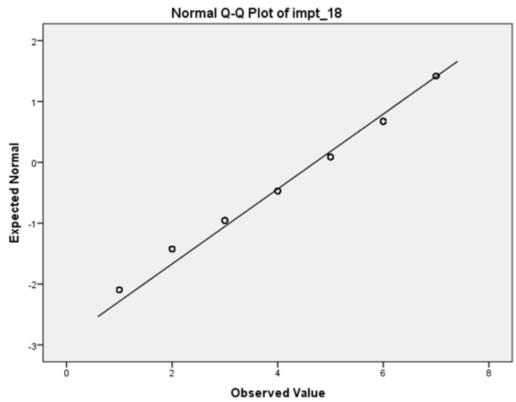
			Statistic	Std. Error
impt_18	Mean		4,71	,071
	95% Confidence Interval for Mean	Lower Bound	4,57	
		Upper Bound	4,85	
	5% Trimmed Mean		4,77	
	Median		5,00	
	Variance		2,638	
	Std. Deviation		1,624	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,409	,107
	Kurtosis		-,578	,213

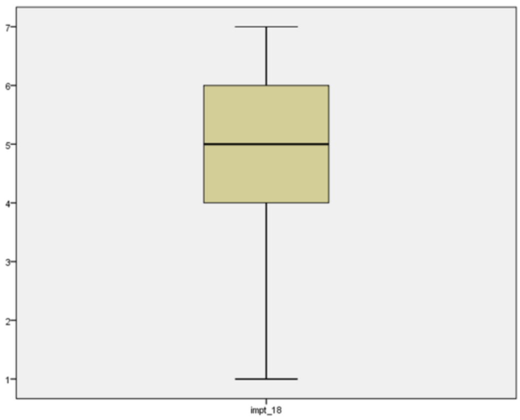
Tests of Normality

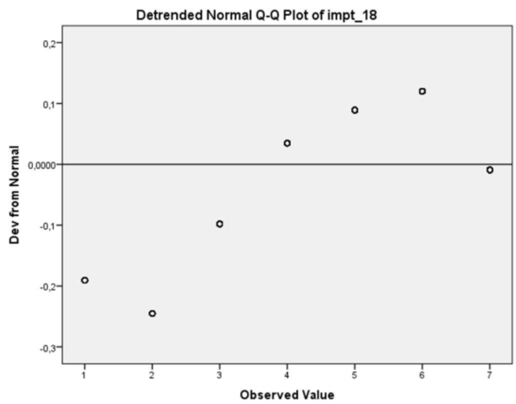
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_18	,154	524	,000	,932	524	,000

a. Lilliefors Significance Correction









APPENDIX 23 – STATISTICS FOR VARIABLE IMPT_19

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_19	518	98,1%	10	1,9%	528	100,0%

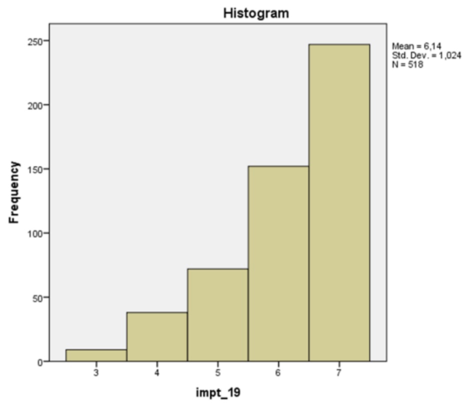
Descriptives

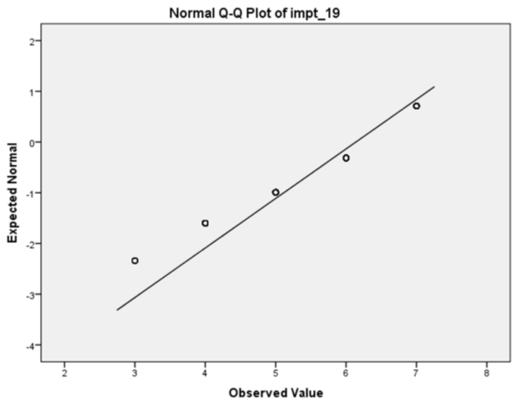
			Statistic	Std. Error
impt_19	Mean		6,14	,045
	95% Confidence Interval for Mean	Lower Bound	6,05	
		Upper Bound	6,23	
	5% Trimmed Mean		6,23	
	Median		6,00	
	Variance		1,048	
	Std. Deviation		1,024	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		1	
	Skewness		-1,084	,107
	Kurtosis		,412	,214

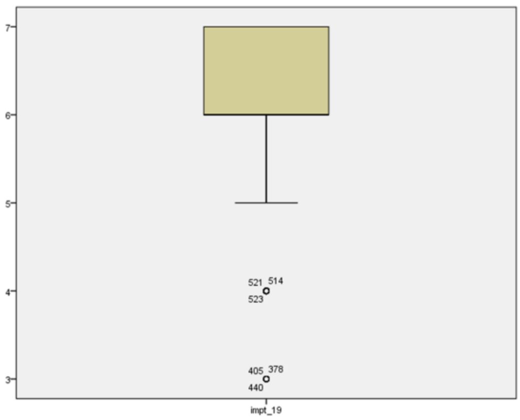
Tests of Normality

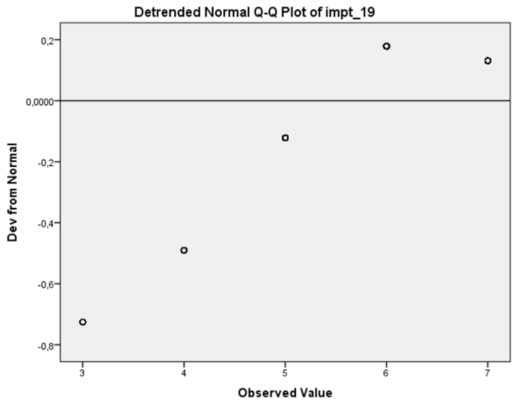
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_19	,277	518	,000	,788	518	,000

a. Lilliefors Significance Correction









APPENDIX 24 – STATISTICS FOR VARIABLE IMPT_20

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_20	517	97,9%	11	2,1%	528	100,0%

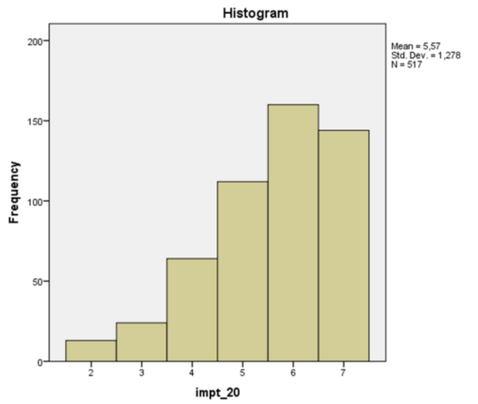
Descriptives

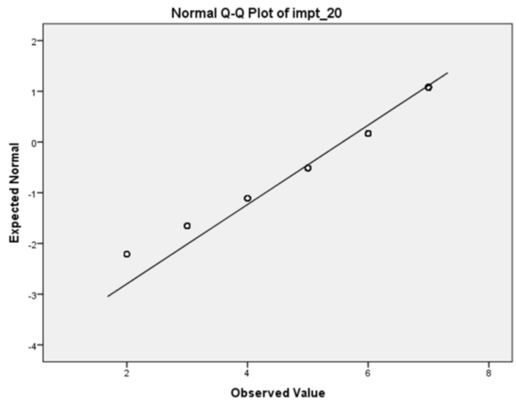
			Statistic	Std. Error
impt_20	Mean		5,57	,056
	95% Confidence Interval for Mean	Lower Bound	5,46	
		Upper Bound	5,68	
	5% Trimmed Mean		5,67	
	Median		6,00	
	Variance		1,633	
	Std. Deviation		1,278	
	Minimum		2	
	Maximum		7	
	Range		5	
	Interquartile Range		2	
	Skewness		-,788	,107
	Kurtosis		,059	,214

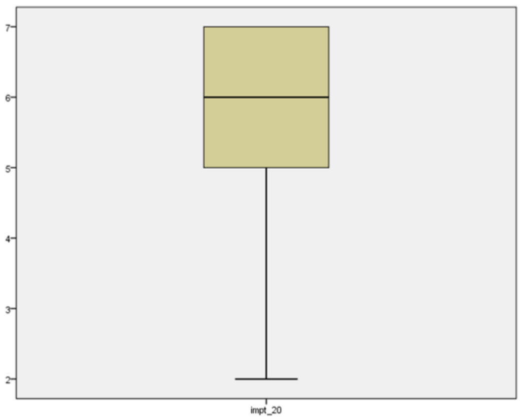
Tests of Normality

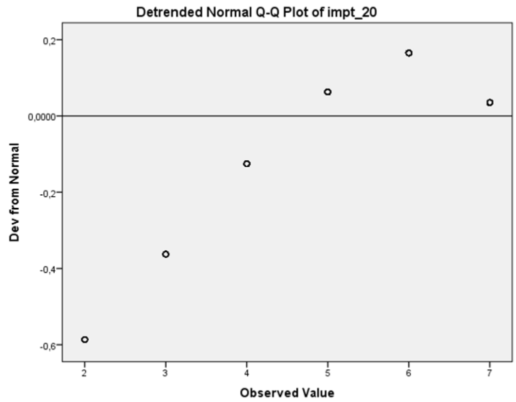
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_20	,218	517	,000	,878	517	,000

a. Lilliefors Significance Correction









APPENDIX 25 – STATISTICS FOR VARIABLE IMPT_21

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
impt_21	517	97,9%	11	2,1%	528	100,0%

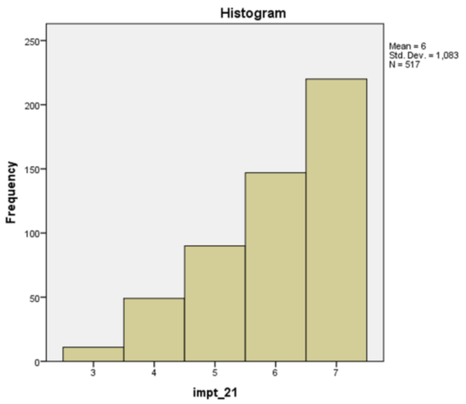
Descriptives

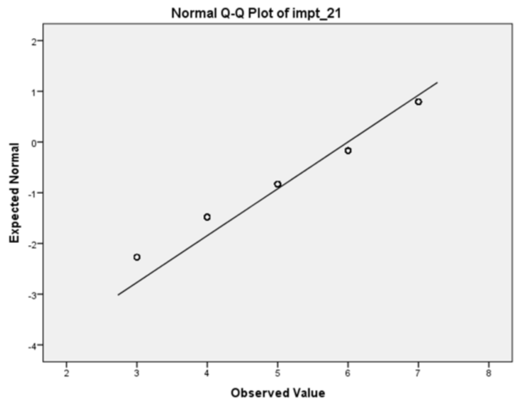
			Statistic	Std. Error
impt_21	Mean		6,00	,048
	95% Confidence Interval for Mean	Lower Bound	5,90	
		Upper Bound	6,09	
	5% Trimmed Mean		6,08	
	Median		6,00	
	Variance		1,172	
	Std. Deviation		1,083	
	Minimum		3	
	Maximum		7	
	Range		4	
	Interquartile Range		2	
	Skewness		-,851	,107
	Kurtosis		-,193	,214

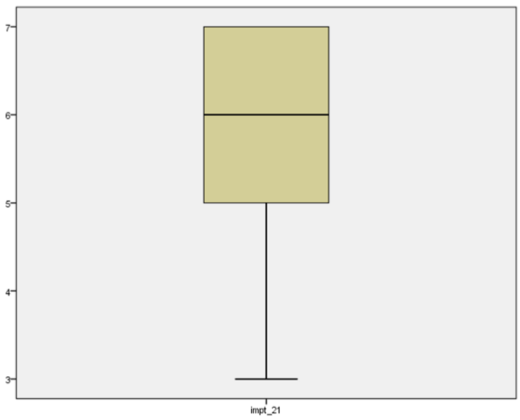
Tests of Normality

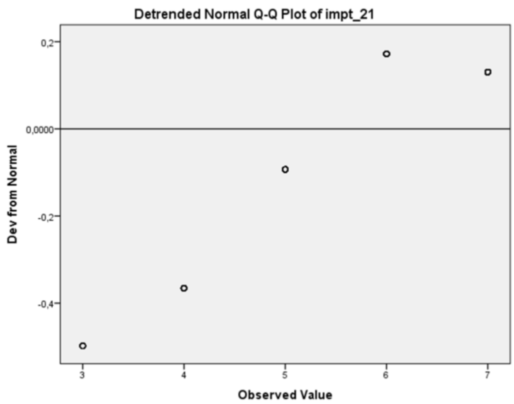
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
impt_21	,248	517	,000	,822	517	,000

a. Lilliefors Significance Correction









APPENDIX 26 – STATISTICS FOR FACTOR ANALISYS (COMPLETE)

Correlation Matrix

		impt_01	impt_02	impt_03	impt_04	impt_05	impt_06	impt_07	impt_08	impt_09	impt_10
Correlation	impt_01	1,000	,258	,186	,127	,231	,186	,145	,133	,044	,151
	impt_02	,258	1,000	,386	,173	,240	,161	,262	,219	,247	,264
	impt_03	,186	,386	1,000	,234	,188	,138	,245	,166	,246	,350
	impt_04	,127	,173	,234	1,000	,353	,245	,156	,117	,117	,197
	impt_05	,231	,240	,188	,353	1,000	,456	,228	,276	,103	,256
	impt_06	,186	,161	,138	,245	,456	1,000	,252	,316	,139	,247
	impt_07	,145	,262	,245	,156	,228	,252	1,000	,379	,232	,262
	impt_08	,133	,219	,166	,117	,276	,316	,379	1,000	,310	,301
	impt_09	,044	,247	,246	,117	,103	,139	,232	,310	1,000	,297
	impt_10	,151	,264	,350	,197	,256	,247	,262	,301	,297	1,000
	impt_11	,117	,239	,291	,186	,214	,161	,259	,302	,293	,334
	impt_12	,230	,297	,209	,173	,246	,257	,186	,185	,152	,309
	impt_13	,142	,180	,235	,201	,271	,209	,169	,158	,177	,237
	impt_14	,127	,225	,225	,121	,202	,206	,288	,239	,284	,501
	impt_15	,113	,168	,264	,136	,199	,164	,267	,247	,251	,252
	impt_16	,196	,226	,279	,201	,192	,199	,253	,176	,206	,292
	impt_17	,161	,255	,150	,238	,221	,157	,154	,120	,173	,199
	impt_18	,179	,254	,274	,128	,162	,083	,201	,133	,356	,233
	impt_19	,116	,209	,134	,188	,224	,244	,202	,227	,188	,197
	impt_20	,150	,229	,289	,173	,216	,211	,255	,181	,191	,254
	impt_21	,103	,246	,205	,194	,256	,235	,183	,198	,239	,240

		impt_11	impt_12	impt_13	impt_14	impt_15	impt_16	impt_17	impt_18	impt_19	impt_20	impt_21
Correlation	impt_01	,117	,230	,142	,127	,113	,196	,161	,179	,116	,150	,103
	impt_02	,239	,297	,180	,225	,168	,226	,255	,254	,209	,229	,246
	impt_03	,291	,209	,235	,225	,264	,279	,150	,274	,134	,289	,205
	impt_04	,186	,173	,201	,121	,136	,201	,238	,128	,188	,173	,194
	impt_05	,214	,246	,271	,202	,199	,192	,221	,162	,224	,216	,256
	impt_06	,161	,257	,209	,206	,164	,199	,157	,083	,244	,211	,235
	impt_07	,259	,186	,169	,288	,267	,253	,154	,201	,202	,255	,183
	impt_08	,302	,185	,158	,239	,247	,176	,120	,133	,227	,181	,198
	impt_09	,293	,152	,177	,284	,251	,206	,173	,356	,188	,191	,239
	impt_10	,334	,309	,237	,501	,252	,292	,199	,233	,197	,254	,240
	impt_11	1,000	,346	,339	,246	,198	,161	,125	,220	,207	,174	,110
	impt_12	,346	1,000	,467	,306	,200	,224	,312	,181	,230	,220	,264
	impt_13	,339	,467	1,000	,260	,244	,218	,250	,190	,171	,225	,224
	impt_14	,246	,306	,260	1,000	,295	,207	,173	,205	,244	,212	,205
	impt_15	,198	,200	,244	,295	1,000	,392	,187	,228	,208	,178	,228
	impt_16	,161	,224	,218	,207	,392	1,000	,276	,224	,227	,278	,268
	impt_17	,125	,312	,250	,173	,187	,276	1,000	,229	,300	,203	,314
	impt_18	,220	,181	,190	,205	,228	,224	,229	1,000	,281	,304	,305
	impt_19	,207	,230	,171	,244	,208	,227	,300	,281	1,000	,422	,386
	impt_20	,174	,220	,225	,212	,178	,278	,203	,304	,422	1,000	,451
	impt_21	,110	,264	,224	,205	,228	,268	,314	,305	,386	,451	1,000

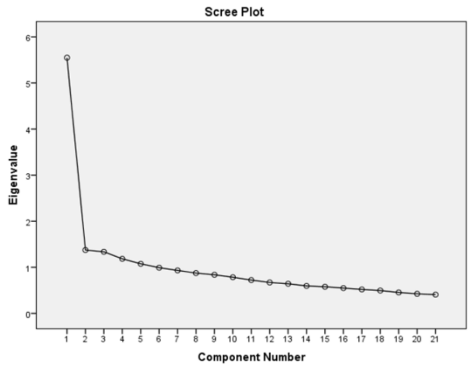
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,877
Bartlett's Test of Sphericity	Approx. Chi-Square	2104,835
	df	210
	Sig.	,000

Communalities

	Initial	Extraction
impt_01	1,000	,482
impt_02	1,000	,479
impt_03	1,000	,551
impt_04	1,000	,352
impt_05	1,000	,606
impt_06	1,000	,623
impt_07	1,000	,460
impt_08	1,000	,581
impt_09	1,000	,482
impt_10	1,000	,475
impt_11	1,000	,483
impt_12	1,000	,650
impt_13	1,000	,618
impt_14	1,000	,462
impt_15	1,000	,307
impt_16	1,000	,348
impt_17	1,000	,426
impt_18	1,000	,469
impt_19	1,000	,557
impt_20	1,000	,514
impt_21	1,000	,593

Extraction Method: Principal Component Analysis.



Component Matrix[a]

	Component				
	1	2	3	4	5
impt_01	,355	,187	,175	,239	,482
impt_02	,534	-,049	-,046	,213	,380
impt_03	,532	-,211	-,086	,242	,396
impt_04	,418	,323	,214	,036	,162
impt_05	,529	,341	,418	-,163	,096
impt_06	,484	,277	,431	-,355	-,018
impt_07	,520	-,222	,105	-,320	,166
impt_08	,500	-,243	,245	-,461	-,008
impt_09	,488	-,412	-,236	-,126	-,054
impt_10	,607	-,301	,101	,017	-,073
impt_11	,516	-,330	,214	,179	-,173
impt_12	,563	,090	,205	,422	-,323
impt_13	,520	,050	,193	,408	-,376
impt_14	,547	-,314	,065	-,014	-,245
impt_15	,505	-,196	-,095	-,070	,019
impt_16	,530	,037	-,165	,028	,194
impt_17	,477	,340	-,165	,211	-,106
impt_18	,497	-,073	-,446	,079	,107
impt_19	,523	,293	-,295	-,242	-,227
impt_20	,547	,235	-,368	-,152	-,033
impt_21	,551	,327	-,371	-,149	-,150

Extraction Method: Principal Component Analysis.
a. 5 components extracted.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5,549	26,423	26,423	5,549	26,423	26,423	3,012
2	1,375	6,548	32,971	1,375	6,548	32,971	3,501
3	1,337	6,365	39,336	1,337	6,365	39,336	1,896
4	1,184	5,639	44,974	1,184	5,639	44,974	3,108
5	1,076	5,125	50,099	1,076	5,125	50,099	3,002
6	,991	4,720	54,819				
7	,933	4,441	59,260				
8	,874	4,164	63,424				
9	,838	3,990	67,414				
10	,784	3,734	71,148				
11	,723	3,441	74,589				
12	,671	3,193	77,782				
13	,643	3,062	80,843				
14	,596	2,837	83,681				
15	,578	2,751	86,432				
16	,549	2,615	89,047				
17	,520	2,475	91,521				
18	,495	2,359	93,881				
19	,454	2,162	96,043				
20	,424	2,020	98,063				
21	,407	1,937	100,000				

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Structure Matrix

	Component				
	1	2	3	4	5
impt_01	-,008	,118	,314	,179	,629
impt_02	,264	,298	,104	,287	,680
impt_03	,353	,251	-,019	,291	,704
impt_04	,044	,273	,474	,262	,381
impt_05	,198	,292	,723	,309	,328
impt_06	,297	,277	,736	,234	,153
impt_07	,606	,261	,270	,134	,330
impt_08	,679	,211	,376	,160	,144
impt_09	,620	,354	-,161	,242	,251
impt_10	,578	,276	,115	,484	,352
impt_11	,480	,128	,075	,585	,280
impt_12	,141	,305	,212	,795	,297
impt_13	,147	,276	,166	,782	,229
impt_14	,567	,279	,055	,498	,189
impt_15	,470	,350	,044	,275	,323
impt_16	,285	,450	,115	,238	,493
impt_17	-,011	,540	,164	,425	,324
impt_18	,304	,544	-,170	,219	,446
impt_19	,239	,719	,215	,239	,115
impt_20	,244	,711	,132	,199	,296
impt_21	,189	,766	,168	,252	,222

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Component Correlation Matrix

Component	1	2	3	4	5
1	1,000	,264	,058	,250	,238
2	,264	1,000	,144	,311	,333
3	,058	,144	1,000	,151	,146
4	,250	,311	,151	1,000	,315
5	,238	,333	,146	,315	1,000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

APPENDIX 27 – STATISTICS FOR FACTOR ANALISYS (W/OUT IMPT_16)

Correlation Matrix

		impt_01	impt_02	impt_03	impt_04	impt_05	impt_06	impt_07	impt_08	impt_09	impt_10	impt_11	impt_12	impt_13	impt_14	impt_15	impt_17	impt_18	impt_19	impt_20	impt_21
Correlation	impt_01	1,000	,259	,187	,123	,225	,175	,146	,146	,053	,149	,120	,222	,137	,119	,128	,169	,181	,115	,153	,111
	impt_02	,259	1,000	,386	,174	,239	,157	,262	,221	,251	,262	,239	,296	,169	,217	,164	,250	,259	,208	,228	,251
	impt_03	,187	,386	1,000	,235	,185	,142	,237	,160	,246	,346	,293	,206	,232	,220	,265	,150	,274	,136	,289	,212
	impt_04	,123	,174	,235	1,000	,354	,245	,155	,114	,120	,198	,183	,175	,191	,120	,131	,229	,130	,188	,171	,196
	impt_05	,225	,239	,185	,354	1,000	,449	,230	,270	,104	,255	,204	,247	,259	,197	,190	,212	,160	,222	,213	,249
	impt_06	,175	,157	,142	,245	,449	1,000	,237	,291	,134	,248	,161	,257	,216	,213	,166	,152	,078	,244	,207	,231
	impt_07	,146	,262	,237	,155	,230	,237	1,000	,384	,236	,262	,250	,185	,158	,283	,258	,149	,205	,197	,255	,175
	impt_08	,146	,221	,160	,114	,270	,291	,384	1,000	,320	,308	,290	,181	,138	,236	,256	,121	,140	,215	,181	,200
	impt_09	,053	,251	,246	,120	,104	,134	,236	,320	1,000	,300	,288	,151	,164	,279	,255	,169	,361	,185	,192	,245
	impt_10	,149	,262	,346	,198	,255	,248	,262	,308	,300	1,000	,325	,310	,232	,505	,257	,195	,231	,192	,253	,234
	impt_11	,120	,239	,293	,183	,204	,161	,250	,290	,288	,325	1,000	,340	,339	,240	,197	,130	,221	,209	,176	,118
	impt_12	,222	,296	,206	,175	,247	,257	,185	,181	,151	,310	,340	1,000	,457	,308	,189	,303	,180	,228	,217	,257
	impt_13	,137	,169	,232	,191	,259	,216	,158	,138	,164	,232	,339	,457	1,000	,272	,251	,257	,180	,170	,226	,206
	impt_14	,119	,217	,220	,120	,197	,213	,283	,236	,279	,505	,240	,308	,272	1,000	,298	,171	,201	,237	,211	,189
	impt_15	,128	,164	,265	,131	,190	,166	,258	,256	,255	,257	,197	,189	,251	,298	1,000	,199	,221	,202	,182	,227
	impt_17	,169	,250	,150	,229	,212	,152	,149	,121	,169	,195	,130	,303	,257	,171	,199	1,000	,223	,298	,206	,309
	impt_18	,181	,259	,274	,130	,160	,078	,205	,140	,361	,231	,221	,180	,180	,201	,221	,223	1,000	,278	,305	,309
	impt_19	,115	,208	,136	,188	,222	,244	,197	,215	,185	,192	,209	,228	,170	,237	,202	,298	,278	1,000	,421	,384
	impt_20	,153	,228	,289	,171	,213	,207	,255	,181	,192	,253	,176	,217	,226	,211	,182	,206	,305	,421	1,000	,445
	impt_21	,111	,251	,212	,196	,249	,231	,175	,200	,245	,234	,118	,257	,206	,189	,227	,309	,309	,384	,445	1,000

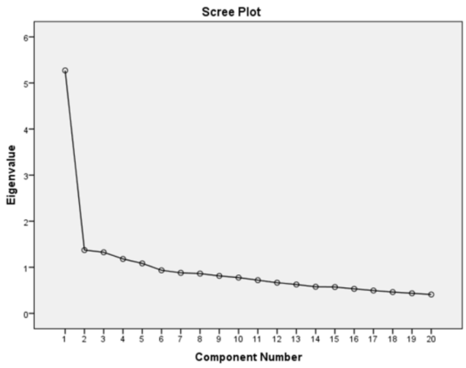
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,871
Bartlett's Test of Sphericity	Approx. Chi-Square	1970,610
	df	190
	Sig.	,000

Communalities

	Initial	Extraction
impt_01	1,000	,464
impt_02	1,000	,541
impt_03	1,000	,534
impt_04	1,000	,360
impt_05	1,000	,614
impt_06	1,000	,613
impt_07	1,000	,457
impt_08	1,000	,576
impt_09	1,000	,497
impt_10	1,000	,487
impt_11	1,000	,442
impt_12	1,000	,616
impt_13	1,000	,627
impt_14	1,000	,503
impt_15	1,000	,305
impt_17	1,000	,413
impt_18	1,000	,507
impt_19	1,000	,564
impt_20	1,000	,522
impt_21	1,000	,594

Extraction Method: Principal Component Analysis.



Component Matrix[a]

	Component				
	1	2	3	4	5
impt_01	,356	,177	,141	-,148	,514
impt_02	,539	-,046	-,079	-,158	,466
impt_03	,531	-,196	-,077	-,212	,404
impt_04	,417	,340	,197	,019	,179
impt_05	,530	,361	,380	,216	,111
impt_06	,484	,297	,400	,354	-,072
impt_07	,515	-,231	,096	,339	,116
impt_08	,505	-,259	,194	,465	,000
impt_09	,495	-,424	-,244	,111	-,016
impt_10	,608	-,297	,137	-,021	-,098
impt_11	,525	-,284	,187	-,217	-,056
impt_12	,565	,117	,213	-,437	-,217
impt_13	,516	,083	,215	-,456	-,316
impt_14	,551	-,308	,112	-,033	-,302
impt_15	,490	-,210	-,029	,051	-,132
impt_17	,470	,327	-,165	-,221	-,090
impt_18	,500	-,095	-,468	-,079	,151
impt_19	,523	,290	-,337	,192	-,236
impt_20	,547	,216	-,397	,125	-,054
impt_21	,548	,303	-,411	,125	-,133

Extraction Method: Principal Component Analysis.
a. 5 components extracted.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5,272	26,359	26,359	5,272	26,359	26,359	3,044
2	1,374	6,869	33,228	1,374	6,869	33,228	1,857
3	1,326	6,628	39,856	1,326	6,628	39,856	3,301
4	1,181	5,903	45,759	1,181	5,903	45,759	2,934
5	1,084	5,420	51,180	1,084	5,420	51,180	2,688
6	,935	4,674	55,854				
7	,880	4,401	60,254				
8	,863	4,317	64,571				
9	,814	4,068	68,639				
10	,776	3,880	72,519				
11	,720	3,599	76,117				
12	,666	3,330	79,448				
13	,626	3,131	82,579				
14	,578	2,888	85,467				
15	,572	2,859	88,326				
16	,532	2,661	90,987				
17	,495	2,475	93,462				
18	,462	2,310	95,772				
19	,436	2,181	97,953				
20	,409	2,047	100,000				

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Structure Matrix

	Component				
	1	2	3	4	5
impt_01	,030	,309	-,130	-,161	,627
impt_02	,274	,104	-,314	-,248	,724
impt_03	,346	-,011	-,259	-,300	,691
impt_04	,070	,495	-,273	-,243	,366
impt_05	,230	,729	-,290	-,274	,319
impt_06	,313	,724	-,270	-,237	,119
impt_07	,617	,251	-,250	-,118	,307
impt_08	,696	,329	-,212	-,108	,175
impt_09	,620	-,174	-,359	-,203	,284
impt_10	,598	,117	-,261	-,487	,307
impt_11	,457	,055	-,147	-,546	,339
impt_12	,161	,223	-,301	-,769	,299
impt_13	,151	,170	-,267	-,787	,201
impt_14	,579	,053	-,264	-,528	,128
impt_15	,485	,048	-,318	-,335	,197
impt_17	,014	,173	-,531	-,429	,289
impt_18	,309	-,173	-,556	-,195	,469
impt_19	,237	,210	-,729	-,228	,109
impt_20	,252	,129	-,717	-,199	,281
impt_21	,205	,166	-,768	-,225	,222

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Component Correlation Matrix

Component	1	2	3	4	5
1	1,000	,068	-,270	-,254	,237
2	,068	1,000	-,147	-,141	,139
3	-,270	-,147	1,000	,300	-,307
4	-,254	-,141	,300	1,000	-,276
5	,237	,139	-,307	-,276	1,000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

APPENDIX 28 – STATISTICS FOR FACTOR ANALISYS (W/OUT IMPT_15)

Correlation Matrix

		impt_01	impt_02	impt_03	impt_04	impt_05	impt_06	impt_07	impt_08	impt_09	impt_10	impt_11	impt_12	impt_13	impt_14	impt_17	impt_18	impt_19	impt_20	impt_21
Correlation	impt_01	1,000	,255	,190	,117	,224	,174	,156	,153	,054	,156	,115	,234	,132	,131	,169	,177	,114	,163	,115
	impt_02	,255	1,000	,387	,172	,236	,154	,255	,217	,243	,256	,240	,289	,169	,215	,250	,260	,206	,225	,250
	impt_03	,190	,387	1,000	,232	,185	,139	,235	,160	,239	,344	,288	,211	,230	,223	,152	,272	,136	,292	,213
	impt_04	,117	,172	,232	1,000	,354	,245	,142	,107	,118	,194	,177	,166	,195	,112	,231	,125	,190	,168	,189
	impt_05	,224	,236	,185	,354	1,000	,446	,222	,267	,098	,255	,195	,249	,259	,194	,213	,155	,224	,215	,245
	impt_06	,174	,154	,139	,245	,446	1,000	,236	,290	,140	,248	,164	,246	,216	,212	,152	,076	,241	,204	,229
	impt_07	,156	,255	,235	,142	,222	,236	1,000	,391	,240	,266	,252	,189	,146	,292	,141	,207	,188	,255	,184
	impt_08	,153	,217	,160	,107	,267	,290	,391	1,000	,319	,312	,288	,186	,131	,242	,117	,141	,211	,183	,205
	impt_09	,054	,243	,239	,118	,098	,140	,240	,319	1,000	,302	,292	,136	,163	,278	,166	,355	,179	,186	,243
	impt_10	,156	,256	,344	,194	,255	,248	,266	,312	,302	1,000	,320	,313	,229	,506	,194	,227	,192	,257	,235
	impt_11	,115	,240	,288	,177	,195	,164	,252	,288	,292	,320	1,000	,318	,334	,238	,125	,227	,201	,164	,121
	impt_12	,234	,289	,211	,166	,249	,246	,189	,186	,136	,313	,318	1,000	,442	,315	,300	,172	,228	,232	,257
	impt_13	,132	,169	,230	,195	,259	,216	,146	,131	,163	,229	,334	,442	1,000	,265	,260	,174	,172	,223	,199
	impt_14	,131	,215	,223	,112	,194	,212	,292	,242	,278	,506	,238	,315	,265	1,000	,170	,200	,233	,218	,195
	impt_17	,169	,250	,152	,231	,213	,152	,141	,117	,166	,194	,125	,300	,260	,170	1,000	,217	,300	,208	,303
	impt_18	,177	,260	,272	,125	,155	,076	,207	,141	,355	,227	,227	,172	,174	,200	,217	1,000	,272	,296	,312
	impt_19	,114	,206	,136	,190	,224	,241	,188	,211	,179	,192	,201	,228	,172	,233	,300	,272	1,000	,421	,379
	impt_20	,163	,225	,292	,168	,215	,204	,255	,183	,186	,257	,164	,232	,223	,218	,208	,296	,421	1,000	,442
	impt_21	,115	,250	,213	,189	,245	,229	,184	,205	,243	,235	,121	,257	,199	,195	,303	,312	,379	,442	1,000

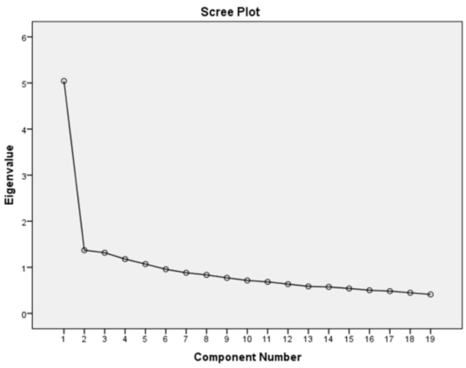
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,866
Bartlett's Test of Sphericity	Approx. Chi-Square	1866,521
	df	171
	Sig.	,000

Communalities

	Initial	Extraction
impt_01	1,000	,455
impt_02	1,000	,539
impt_03	1,000	,538
impt_04	1,000	,367
impt_05	1,000	,618
impt_06	1,000	,611
impt_07	1,000	,466
impt_08	1,000	,585
impt_09	1,000	,500
impt_10	1,000	,506
impt_11	1,000	,456
impt_12	1,000	,599
impt_13	1,000	,623
impt_14	1,000	,506
impt_17	1,000	,419
impt_18	1,000	,508
impt_19	1,000	,571
impt_20	1,000	,524
impt_21	1,000	,588

Extraction Method: Principal Component Analysis.



Component Matrix[a]

	Component				
	1	2	3	4	5
impt_01	,367	,146	,131	-,144	,511
impt_02	,543	-,076	-,096	-,175	,445
impt_03	,529	-,191	-,086	-,246	,392
impt_04	,417	,343	,197	,007	,192
impt_05	,533	,353	,384	,208	,135
impt_06	,488	,265	,410	,362	-,053
impt_07	,513	-,272	,100	,326	,115
impt_08	,504	-,290	,206	,452	-,003
impt_09	,486	-,441	-,231	,114	-,051
impt_10	,611	-,306	,141	-,031	-,134
impt_11	,522	-,314	,171	-,215	-,097
impt_12	,570	,120	,192	-,411	-,233
impt_13	,507	,120	,203	-,455	-,322
impt_14	,549	-,299	,115	-,043	-,316
impt_17	,470	,346	-,170	-,207	-,078
impt_18	,496	-,120	-,474	-,063	,138
impt_19	,524	,287	-,332	,219	-,235
impt_20	,556	,195	-,389	,145	-,066
impt_21	,551	,276	-,408	,164	-,120

Extraction Method: Principal Component Analysis.
a. 5 components extracted.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5,044	26,549	26,549	5,044	26,549	26,549	3,143
2	1,370	7,213	33,762	1,370	7,213	33,762	1,800
3	1,316	6,928	40,690	1,316	6,928	40,690	3,264
4	1,178	6,200	46,890	1,178	6,200	46,890	2,486
5	1,071	5,635	52,525	1,071	5,635	52,525	2,642
6	,957	5,036	57,561				
7	,881	4,637	62,198				
8	,835	4,394	66,593				
9	,771	4,059	70,651				
10	,715	3,762	74,413				
11	,684	3,598	78,011				
12	,635	3,343	81,355				
13	,586	3,084	84,439				
14	,574	3,023	87,461				
15	,541	2,846	90,307				
16	,501	2,636	92,943				
17	,483	2,542	95,485				
18	,447	2,352	97,838				
19	,411	2,162	100,000				

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Structure Matrix

	Component				
	1	2	3	4	5
impt_01	,152	,319	-,131	,035	,617
impt_02	,281	,087	-,320	,238	,722
impt_03	,340	-,011	-,263	,271	,703
impt_04	,239	,509	-,272	,032	,359
impt_05	,288	,726	-,296	,217	,313
impt_06	,266	,696	-,277	,336	,107
impt_07	,200	,190	-,261	,635	,310
impt_08	,204	,265	-,230	,722	,174
impt_09	,287	-,213	-,365	,590	,278
impt_10	,566	,088	-,281	,548	,303
impt_11	,589	,016	-,160	,412	,328
impt_12	,748	,240	-,315	,069	,295
impt_13	,765	,201	-,270	,017	,205
impt_14	,593	,029	-,281	,507	,141
impt_17	,403	,207	-,528	-,079	,297
impt_18	,223	-,189	-,554	,263	,475
impt_19	,251	,205	-,734	,191	,105
impt_20	,238	,122	-,719	,217	,279
impt_21	,234	,158	-,765	,172	,229

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Component Correlation Matrix

Component	1	2	3	4	5
1	1,000	,152	-,334	,242	,304
2	,152	1,000	-,151	,022	,126
3	-,334	-,151	1,000	-,221	-,314
4	,242	,022	-,221	1,000	,197
5	,304	,126	-,314	,197	1,000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

APPENDIX 29 – STATISTICS FOR FACTOR ANALISYS (W/OUT IMPT_10)

Correlation Matrix

		impt_01	impt_02	impt_03	impt_04	impt_05	impt_06	impt_07	impt_08	impt_09	impt_11	impt_12	impt_13	impt_14	impt_17	impt_18	impt_19	impt_20	impt_21
Correlation	impt_01	1,000	,249	,186	,110	,225	,196	,161	,142	,062	,135	,225	,150	,137	,168	,181	,106	,155	,101
	impt_02	,249	1,000	,376	,182	,235	,146	,256	,215	,231	,227	,298	,176	,213	,252	,253	,211	,220	,239
	impt_03	,186	,376	1,000	,230	,187	,137	,233	,162	,243	,288	,202	,224	,223	,154	,274	,138	,283	,215
	impt_04	,110	,182	,230	1,000	,355	,244	,143	,113	,111	,166	,188	,207	,117	,246	,123	,209	,156	,184
	impt_05	,225	,235	,187	,355	1,000	,438	,223	,267	,101	,196	,247	,261	,197	,217	,157	,227	,208	,242
	impt_06	,196	,146	,137	,244	,438	1,000	,238	,285	,149	,180	,257	,245	,225	,167	,075	,246	,196	,223
	impt_07	,161	,256	,233	,143	,223	,238	1,000	,386	,238	,254	,190	,152	,294	,143	,208	,188	,252	,178
	impt_08	,142	,215	,162	,113	,267	,285	,386	1,000	,321	,275	,193	,135	,243	,128	,131	,223	,178	,218
	impt_09	,062	,231	,243	,111	,101	,149	,238	,321	1,000	,297	,127	,165	,280	,168	,353	,177	,178	,247
	impt_11	,135	,227	,288	,166	,196	,180	,254	,275	,297	1,000	,300	,336	,241	,122	,234	,188	,157	,109
	impt_12	,225	,298	,202	,188	,247	,257	,190	,193	,127	,300	1,000	,452	,319	,314	,159	,248	,226	,254
	impt_13	,150	,176	,224	,207	,261	,245	,152	,135	,165	,336	,452	1,000	,274	,274	,171	,185	,211	,191
	impt_14	,137	,213	,223	,117	,197	,225	,294	,243	,280	,241	,319	,274	1,000	,178	,199	,238	,214	,194
	impt_17	,168	,252	,154	,246	,217	,167	,143	,128	,168	,122	,314	,274	,178	1,000	,211	,316	,197	,305
	impt_18	,181	,253	,274	,123	,157	,075	,208	,131	,353	,234	,159	,171	,199	,211	1,000	,263	,284	,296
	impt_19	,106	,211	,138	,209	,227	,246	,188	,223	,177	,188	,248	,185	,238	,316	,263	1,000	,406	,381
	impt_20	,155	,220	,283	,156	,208	,196	,252	,178	,178	,157	,226	,211	,214	,197	,284	,406	1,000	,436
	impt_21	,101	,239	,215	,184	,242	,223	,178	,218	,247	,109	,254	,191	,194	,305	,296	,381	,436	1,000

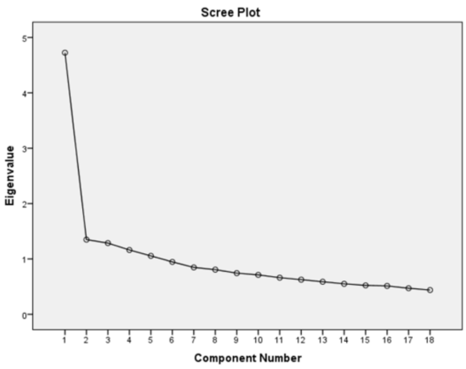
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,861
Bartlett's Test of Sphericity	Approx. Chi-Square	1668,205
	df	153
	Sig.	,000

Communalities

	Initial	Extraction
impt_01	1,000	,433
impt_02	1,000	,515
impt_03	1,000	,543
impt_04	1,000	,391
impt_05	1,000	,612
impt_06	1,000	,601
impt_07	1,000	,494
impt_08	1,000	,611
impt_09	1,000	,528
impt_11	1,000	,516
impt_12	1,000	,616
impt_13	1,000	,660
impt_14	1,000	,427
impt_17	1,000	,437
impt_18	1,000	,506
impt_19	1,000	,567
impt_20	1,000	,516
impt_21	1,000	,601

Extraction Method: Principal Component Analysis.



Component Matrix[a]

	Component				
	1	2	3	4	5
impt_01	,377	,157	,127	,182	,466
impt_02	,544	-,136	,029	,238	,378
impt_03	,516	-,234	,071	,289	,366
impt_04	,431	,374	-,051	-,007	,250
impt_05	,542	,446	,113	-,239	,219
impt_06	,504	,411	,183	-,380	-,005
impt_07	,514	-,212	,293	-,304	,076
impt_08	,500	-,158	,339	-,467	-,057
impt_09	,479	-,513	,117	-,079	-,126
impt_11	,511	-,161	,390	,209	-,182
impt_12	,576	,265	,077	,348	-,296
impt_13	,528	,260	,133	,393	-,377
impt_14	,524	-,115	,199	,012	-,316
impt_17	,494	,203	-,325	,193	-,090
impt_18	,494	-,415	-,231	,146	,125
impt_19	,547	,028	-,433	-,211	-,187
impt_20	,548	-,119	-,429	-,131	,006
impt_21	,555	-,062	-,504	-,175	-,064

Extraction Method: Principal Component Analysis.
a. 5 components extracted.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4,725	26,248	26,248	4,725	26,248	26,248	2,897
2	1,349	7,493	33,741	1,349	7,493	33,741	1,752
3	1,286	7,145	40,885	1,286	7,145	40,885	3,041
4	1,162	6,454	47,340	1,162	6,454	47,340	2,356
5	1,055	5,862	53,202	1,055	5,862	53,202	2,571
6	,946	5,256	58,458				
7	,847	4,703	63,161				
8	,806	4,480	67,642				
9	,743	4,130	71,772				
10	,712	3,954	75,727				
11	,661	3,674	79,401				
12	,626	3,477	82,877				
13	,588	3,266	86,143				
14	,550	3,057	89,200				
15	,522	2,902	92,102				
16	,512	2,847	94,949				
17	,471	2,616	97,566				
18	,438	2,434	100,000				

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Structure Matrix

	Component				
	1	2	3	4	5
impt_01	,183	,337	-,090	-,060	,586
impt_02	,287	,104	-,302	-,225	,707
impt_03	,285	-,001	-,256	-,251	,722
impt_04	,245	,523	-,281	-,020	,357
impt_05	,283	,715	-,287	-,243	,314
impt_06	,306	,672	-,264	-,365	,104
impt_07	,206	,174	-,236	-,664	,314
impt_08	,207	,241	-,232	-,747	,149
impt_09	,280	-,236	-,340	-,613	,297
impt_11	,587	-,019	-,107	-,469	,350
impt_12	,769	,238	-,309	-,106	,274
impt_13	,805	,187	-,240	-,096	,215
impt_14	,540	,036	-,286	-,474	,174
impt_17	,448	,217	-,527	,053	,275
impt_18	,220	-,206	-,507	-,274	,512
impt_19	,292	,195	-,731	-,210	,112
impt_20	,208	,098	-,709	-,220	,294
impt_21	,223	,135	-,774	-,191	,221

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Component Correlation Matrix

Component	1	2	3	4	5
1	1,000	,167	-,320	-,240	,301
2	,167	1,000	-,134	-,023	,113
3	-,320	-,134	1,000	,221	-,293
4	-,240	-,023	,221	1,000	-,213
5	,301	,113	-,293	-,213	1,000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

APPENDIX 30 – STATISTICS FOR FACTOR ANALISYS (W/OUT IMPT_18)

Correlation Matrix

		impt_01	impt_02	impt_03	impt_04	impt_05	impt_06	impt_07	impt_08	impt_09	impt_11	impt_12	impt_13	impt_14	impt_17	impt_19	impt_20	impt_21
Correlation	impt_01	1,000	,250	,185	,110	,224	,197	,161	,143	,063	,134	,224	,150	,138	,169	,103	,156	,102
	impt_02	,250	1,000	,375	,182	,233	,147	,256	,216	,232	,226	,296	,175	,215	,254	,205	,220	,240
	impt_03	,185	,375	1,000	,230	,187	,136	,233	,161	,242	,288	,203	,224	,222	,153	,138	,283	,214
	impt_04	,110	,182	,230	1,000	,355	,244	,143	,113	,111	,166	,188	,207	,117	,246	,208	,156	,184
	impt_05	,224	,233	,187	,355	1,000	,438	,223	,266	,100	,197	,247	,261	,195	,216	,228	,207	,240
	impt_06	,197	,147	,136	,244	,438	1,000	,238	,286	,150	,179	,256	,244	,226	,168	,242	,196	,224
	impt_07	,161	,256	,233	,143	,223	,238	1,000	,386	,239	,254	,190	,152	,294	,143	,186	,252	,178
	impt_08	,143	,216	,161	,113	,266	,286	,386	1,000	,322	,274	,192	,134	,245	,130	,217	,178	,220
	impt_09	,063	,232	,242	,111	,100	,150	,239	,322	1,000	,296	,126	,165	,281	,169	,172	,179	,248
	impt_11	,134	,226	,288	,166	,197	,179	,254	,274	,296	1,000	,300	,336	,239	,120	,190	,157	,108
	impt_12	,224	,296	,203	,188	,247	,256	,190	,192	,126	,300	1,000	,452	,318	,313	,249	,226	,253
	impt_13	,150	,175	,224	,207	,261	,244	,152	,134	,165	,336	,452	1,000	,273	,274	,184	,211	,191
	impt_14	,138	,215	,222	,117	,195	,226	,294	,245	,281	,239	,318	,273	1,000	,179	,232	,214	,196
	impt_17	,169	,254	,153	,246	,216	,168	,143	,130	,169	,120	,313	,274	,179	1,000	,309	,197	,306
	impt_19	,103	,205	,138	,208	,228	,242	,186	,217	,172	,190	,249	,184	,232	,309	1,000	,402	,374
	impt_20	,156	,220	,283	,156	,207	,196	,252	,178	,179	,157	,226	,211	,214	,197	,402	1,000	,436
	impt_21	,102	,240	,214	,184	,240	,224	,178	,220	,248	,108	,253	,191	,196	,306	,374	,436	1,000

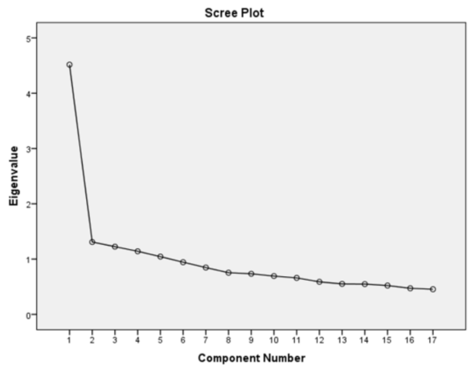
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,858
Bartlett's Test of Sphericity	Approx. Chi-Square	1532,723
	df	136
	Sig.	,000

Communalities

	Initial	Extraction
impt_01	1,000	,440
impt_02	1,000	,582
impt_03	1,000	,586
impt_04	1,000	,393
impt_05	1,000	,645
impt_06	1,000	,617
impt_07	1,000	,495
impt_08	1,000	,602
impt_09	1,000	,501
impt_11	1,000	,518
impt_12	1,000	,604
impt_13	1,000	,667
impt_14	1,000	,422
impt_17	1,000	,435
impt_19	1,000	,561
impt_20	1,000	,552
impt_21	1,000	,615

Extraction Method: Principal Component Analysis.



Component Matrix[a]

	Component				
	1	2	3	4	5
impt_01	,377	-,053	,300	-,016	,453
impt_02	,542	,117	,000	-,243	,465
impt_03	,509	,205	,001	-,297	,443
impt_04	,441	-,316	,213	,146	,179
impt_05	,555	-,247	,299	,421	,096
impt_06	,525	-,148	,233	,501	-,118
impt_07	,517	,386	-,063	,263	,073
impt_08	,512	,396	-,076	,412	-,086
impt_09	,459	,462	-,253	-,042	-,107
impt_11	,510	,370	,231	-,184	-,184
impt_12	,589	-,144	,266	-,319	-,252
impt_13	,537	-,116	,345	-,329	-,371
impt_14	,529	,240	,008	-,080	-,279
impt_17	,495	-,367	-,067	-,219	-,048
impt_19	,538	-,287	-,400	,059	-,162
impt_20	,542	-,177	-,468	-,043	,080
impt_21	,548	-,265	-,494	,002	-,009

Extraction Method: Principal Component Analysis.
a. 5 components extracted.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4,517	26,569	26,569	4,517	26,569	26,569	2,718
2	1,308	7,695	34,264	1,308	7,695	34,264	2,212
3	1,224	7,202	41,466	1,224	7,202	41,466	2,783
4	1,141	6,713	48,180	1,141	6,713	48,180	2,143
5	1,045	6,145	54,325	1,045	6,145	54,325	2,289
6	,943	5,548	59,874				
7	,846	4,979	64,852				
8	,754	4,435	69,287				
9	,734	4,320	73,607				
10	,692	4,073	77,681				
11	,660	3,880	81,561				
12	,589	3,463	85,024				
13	,551	3,243	88,267				
14	,547	3,219	91,486				
15	,521	3,065	94,552				
16	,472	2,775	97,326				
17	,455	2,674	100,000				

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Structure Matrix

	Component				
	1	2	3	4	5
impt_01	,173	,030	-,070	,389	,588
impt_02	,268	,229	-,313	,145	,746
impt_03	,277	,263	-,260	,058	,740
impt_04	,242	-,019	-,276	,560	,332
impt_05	,265	,176	-,265	,786	,275
impt_06	,279	,305	-,255	,727	,082
impt_07	,173	,648	-,228	,261	,317
impt_08	,169	,727	-,230	,321	,151
impt_09	,278	,641	-,302	-,085	,234
impt_11	,588	,476	-,085	,093	,313
impt_12	,758	,099	-,325	,267	,293
impt_13	,809	,093	-,237	,243	,196
impt_14	,520	,480	-,284	,111	,174
impt_17	,443	-,054	-,535	,245	,273
impt_19	,277	,196	-,730	,248	,090
impt_20	,189	,223	-,725	,142	,301
impt_21	,206	,194	-,781	,187	,212

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Component Correlation Matrix

Component	1	2	3	4	5
1	1,000	,213	-,303	,216	,281
2	,213	1,000	-,194	,082	,177
3	-,303	-,194	1,000	-,220	-,245
4	,216	,082	-,220	1,000	,210
5	,281	,177	-,245	,210	1,000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

APPENDIX 31 – STATISTICS FOR VARIABLE PRCT_01

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_01	394	100,0%	0	0,0%	394	100,0%

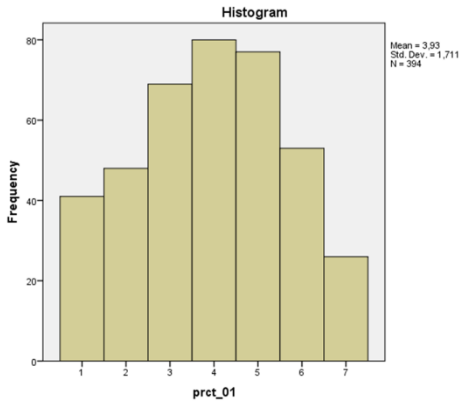
Descriptives

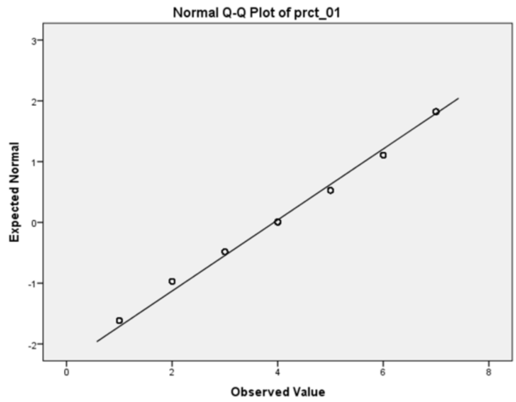
			Statistic	Std. Error
prct_01	Mean		3,93	,086
	95% Confidence Interval for Mean	Lower Bound	3,76	
		Upper Bound	4,10	
	5% Trimmed Mean		3,92	
	Median		4,00	
	Variance		2,929	
	Std. Deviation		1,711	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,061	,123
	Kurtosis		-,878	,245

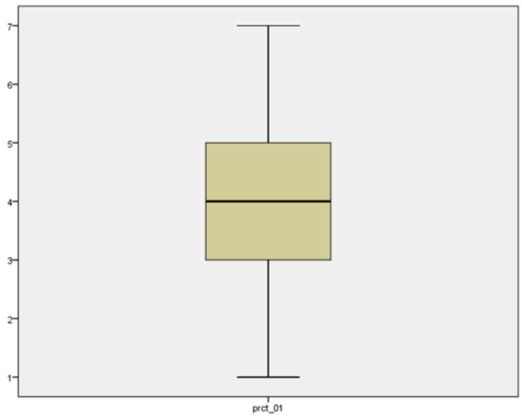
Tests of Normality

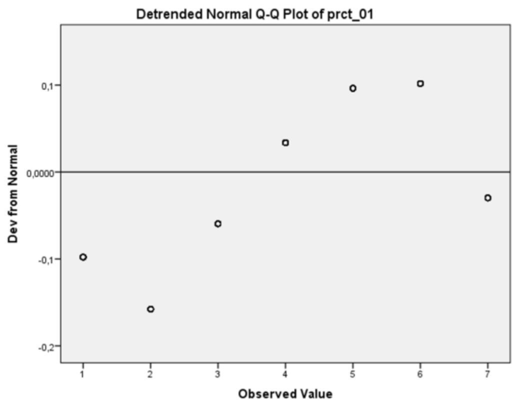
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_01	,130	394	,000	,945	394	,000

a. Lilliefors Significance Correction









APPENDIX 32 – STATISTICS FOR VARIABLE PRCT_02

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_02	394	100,0%	0	0,0%	394	100,0%

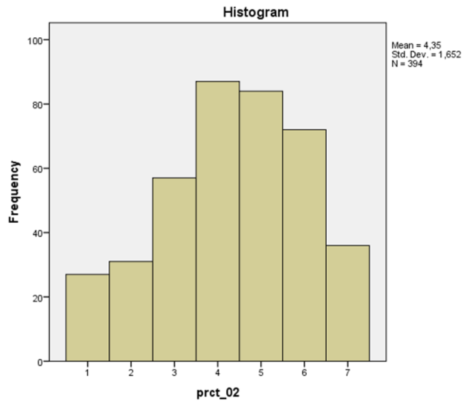
Descriptives

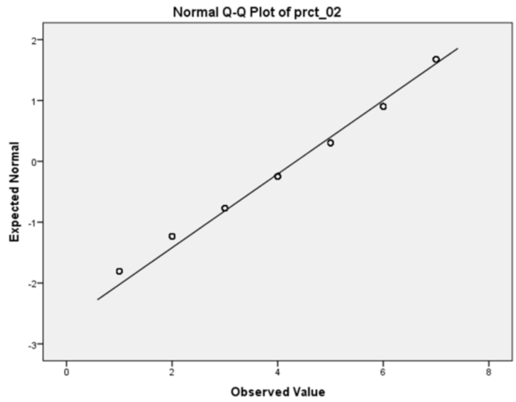
			Statistic	Std. Error
prct_02	Mean		4,35	,083
	95% Confidence Interval for Mean	Lower Bound	4,18	
		Upper Bound	4,51	
	5% Trimmed Mean		4,38	
	Median		4,00	
	Variance		2,730	
	Std. Deviation		1,652	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,300	,123
	Kurtosis		-,649	,245

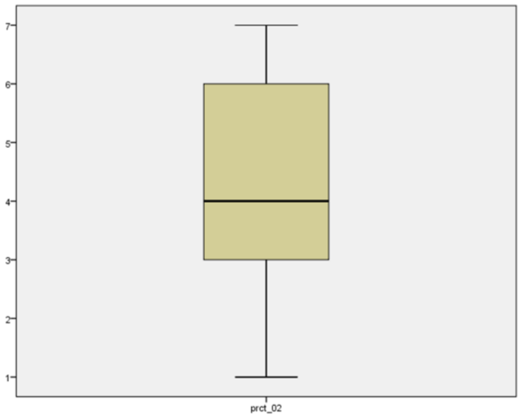
Tests of Normality

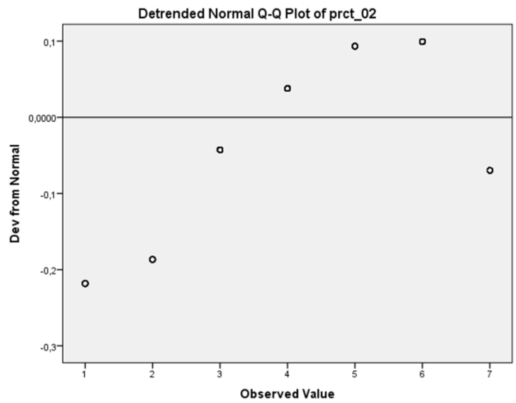
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_02	,141	394	,000	,942	394	,000

a. Lilliefors Significance Correction









APPENDIX 33 – STATISTICS FOR VARIABLE PRCT_03

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_03	392	99,5%	2	,5%	394	100,0%

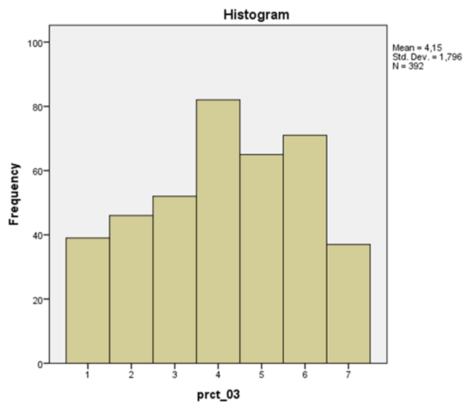
Descriptives

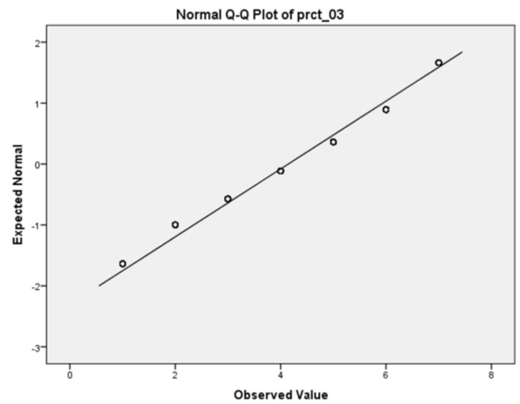
			Statistic	Std. Error
prct_03	Mean		4,15	,091
	95% Confidence Interval for Mean	Lower Bound	3,97	
		Upper Bound	4,32	
	5% Trimmed Mean		4,16	
	Median		4,00	
	Variance		3,224	
	Std. Deviation		1,796	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,174	,123
	Kurtosis		-,971	,246

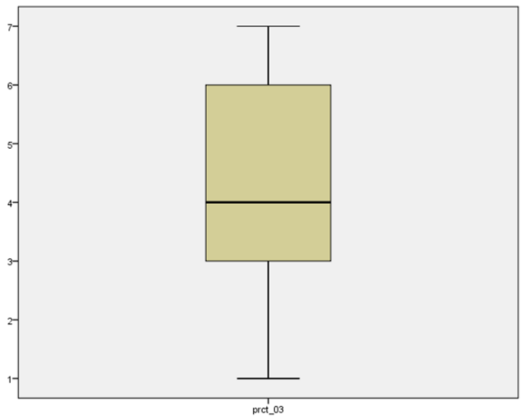
Tests of Normality

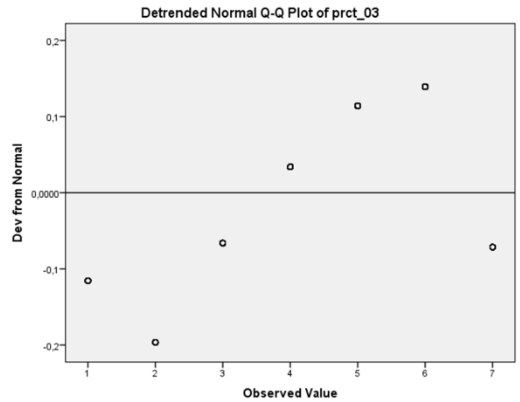
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_03	,125	392	,000	,936	392	,000

a. Lilliefors Significance Correction









APPENDIX 34 – STATISTICS FOR VARIABLE PRCT_04

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_04	394	100,0%	0	0,0%	394	100,0%

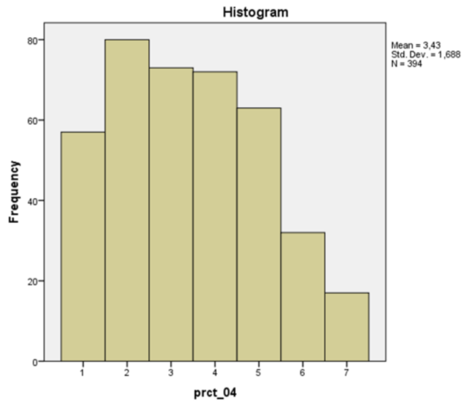
Descriptives

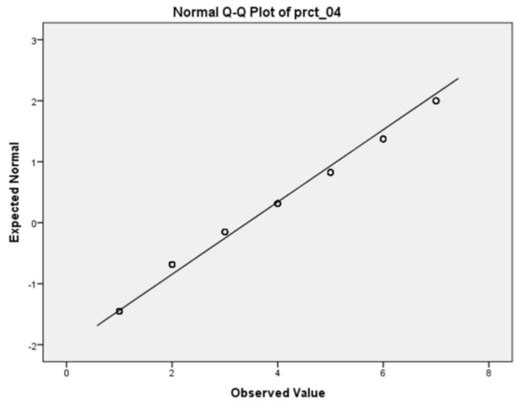
			Statistic	Std. Error
prct_04	Mean		3,43	,085
	95% Confidence Interval for Mean	Lower Bound	3,26	
		Upper Bound	3,59	
	5% Trimmed Mean		3,37	
	Median		3,00	
	Variance		2,851	
	Std. Deviation		1,688	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		,281	,123
	Kurtosis		-,836	,245

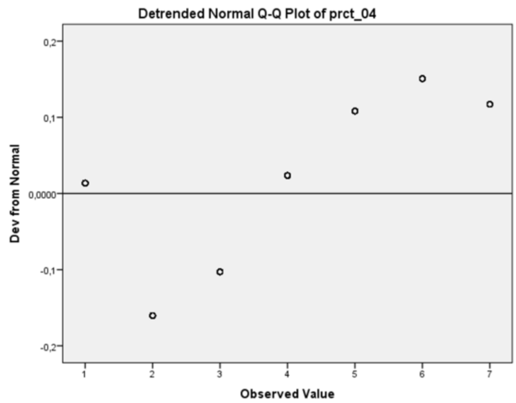
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_04	,149	394	,000	,935	394	,000

a. Lilliefors Significance Correction







APPENDIX 35 – STATISTICS FOR VARIABLE PRCT_05

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_05	393	99,7%	1	,3%	394	100,0%

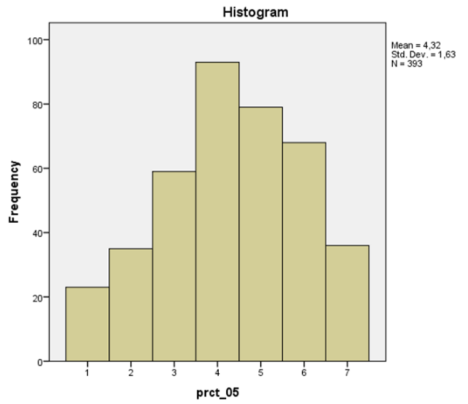
Descriptives

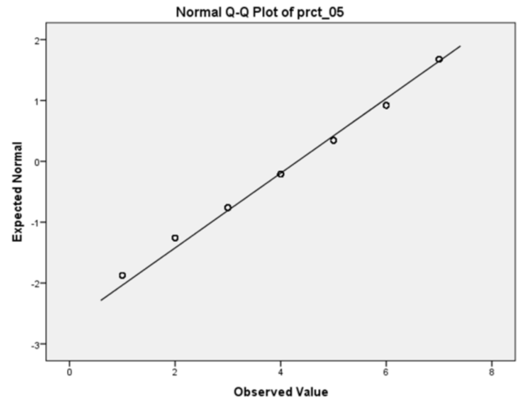
			Statistic	Std. Error
prct_05	Mean		4,32	,082
	95% Confidence Interval for Mean	Lower Bound	4,16	
		Upper Bound	4,48	
	5% Trimmed Mean		4,35	
	Median		4,00	
	Variance		2,656	
	Std. Deviation		1,630	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,220	,123
	Kurtosis		-,673	,246

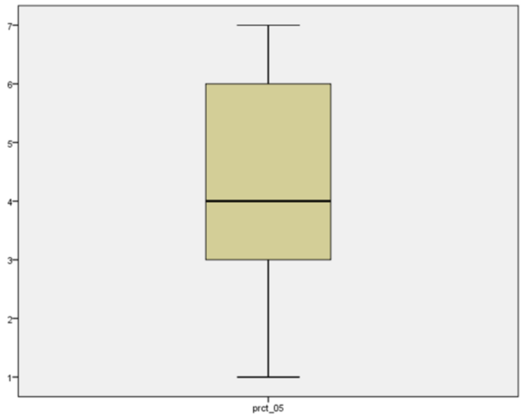
Tests of Normality

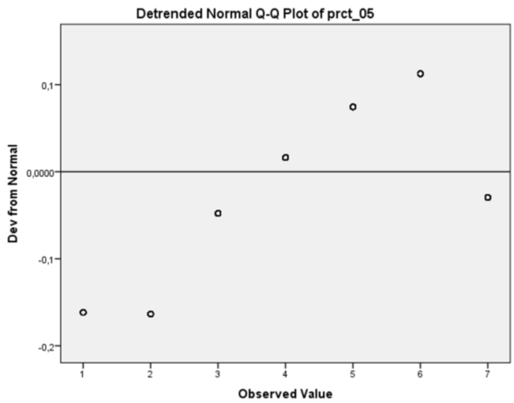
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_05	,128	393	,000	,946	393	,000

a. Lilliefors Significance Correction









APPENDIX 36 – STATISTICS FOR VARIABLE PRCT_06

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_06	394	100,0%	0	0,0%	394	100,0%

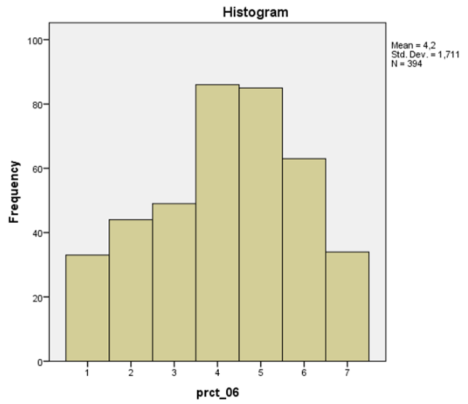
Descriptives

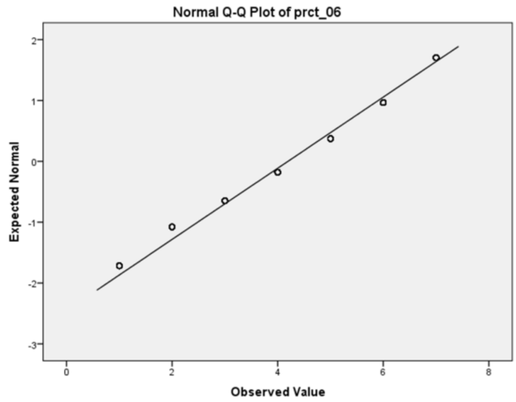
			Statistic	Std. Error
prct_06	Mean		4,20	,086
	95% Confidence Interval for Mean	Lower Bound	4,03	
		Upper Bound	4,36	
	5% Trimmed Mean		4,22	
	Median		4,00	
	Variance		2,926	
	Std. Deviation		1,711	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,236	,123
	Kurtosis		-,799	,245

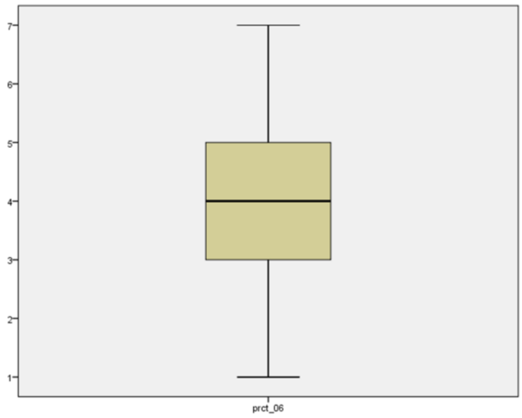
Tests of Normality

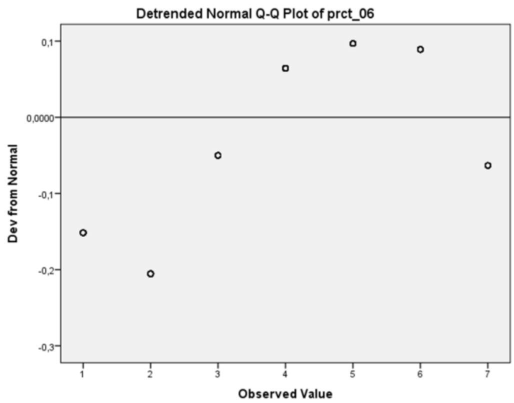
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_06	,143	394	,000	,941	394	,000

a. Lilliefors Significance Correction









APPENDIX 37 – STATISTICS FOR VARIABLE PRCT_07

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_07	394	100,0%	0	0,0%	394	100,0%

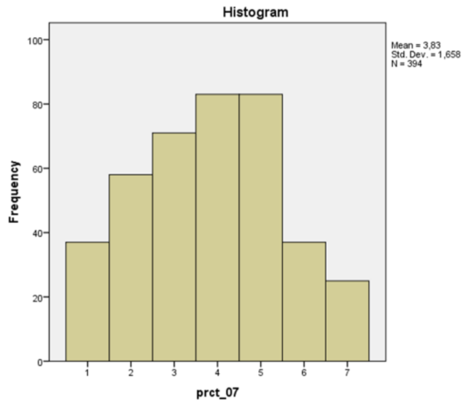
Descriptives

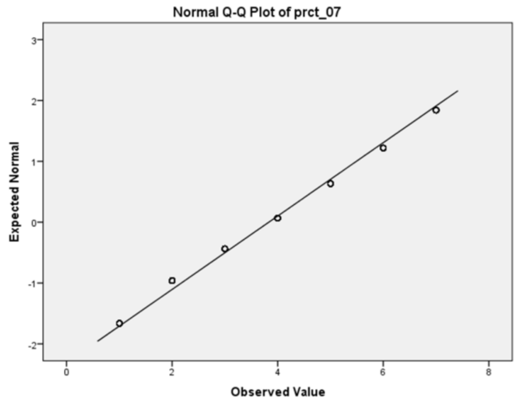
			Statistic	Std. Error
prct_07	Mean		3,83	,084
	95% Confidence Interval for Mean	Lower Bound	3,67	
		Upper Bound	4,00	
	5% Trimmed Mean		3,81	
	Median		4,00	
	Variance		2,750	
	Std. Deviation		1,658	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		,036	,123
	Kurtosis		-,784	,245

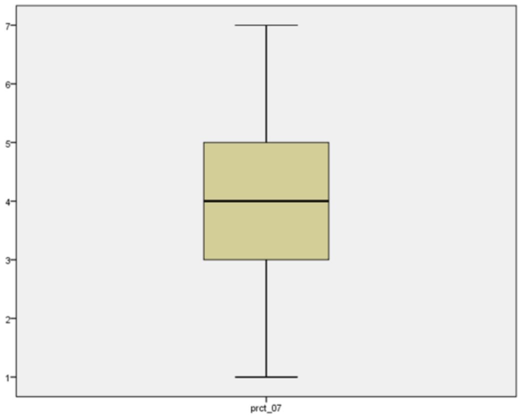
Tests of Normality

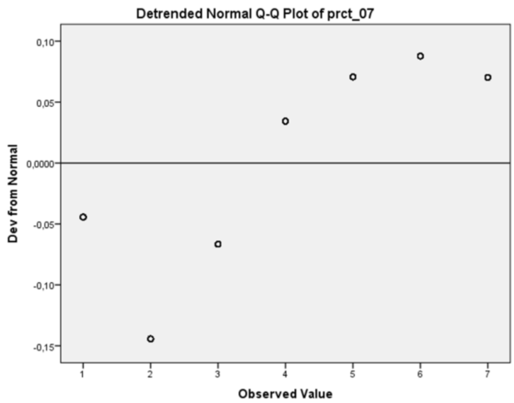
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_07	,127	394	,000	,947	394	,000

a. Lilliefors Significance Correction









APPENDIX 38 – STATISTICS FOR VARIABLE PRCT_08

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_08	392	99,5%	2	,5%	394	100,0%

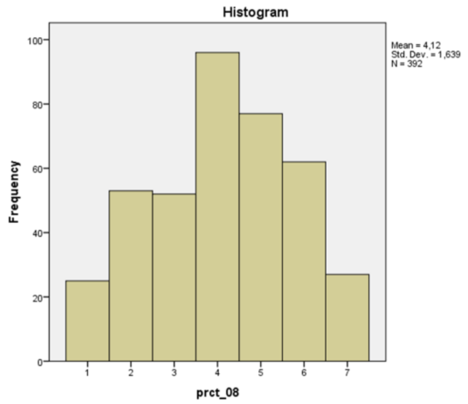
Descriptives

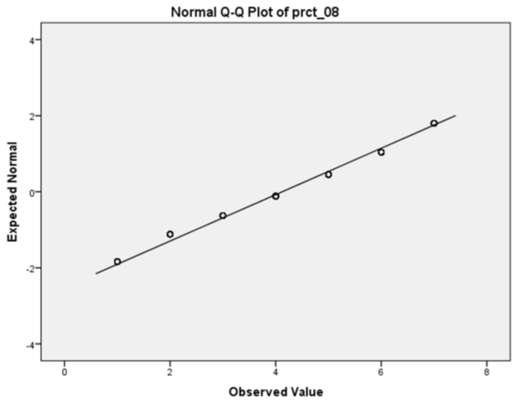
			Statistic	Std. Error
prct_08	Mean		4,13	,083
	95% Confidence Interval for Mean	Lower Bound	3,96	
		Upper Bound	4,29	
	5% Trimmed Mean		4,14	
	Median		4,00	
	Variance		2,688	
	Std. Deviation		1,639	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,142	,123
	Kurtosis		-,793	,246

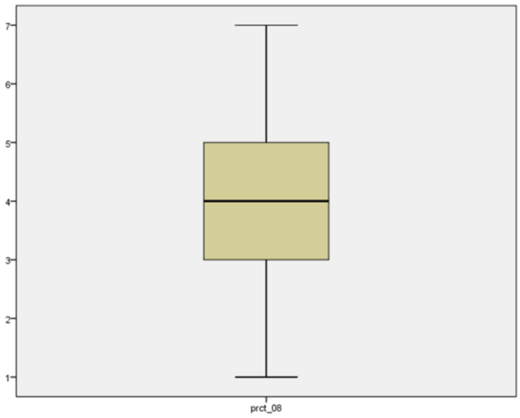
Tests of Normality

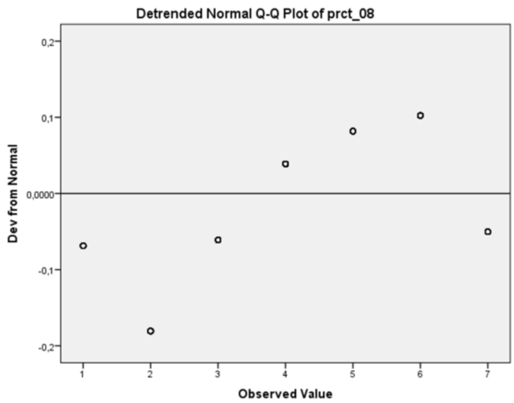
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_08	,138	392	,000	,946	392	,000

a. Lilliefors Significance Correction









APPENDIX 39 – STATISTICS FOR VARIABLE PRCT_09

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_09	394	100,0%	0	0,0%	394	100,0%

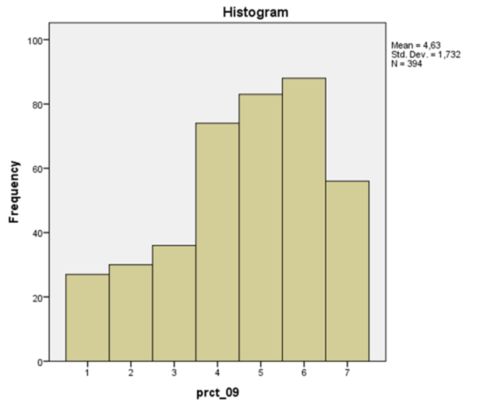
Descriptives

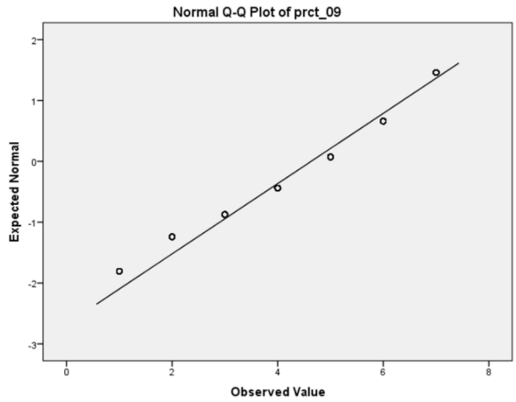
			Statistic	Std. Error
prct_09	Mean		4,63	,087
	95% Confidence Interval for Mean	Lower Bound	4,46	
		Upper Bound	4,81	
	5% Trimmed Mean		4,71	
	Median		5,00	
	Variance		3,001	
	Std. Deviation		1,732	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,517	,123
	Kurtosis		-,588	,245

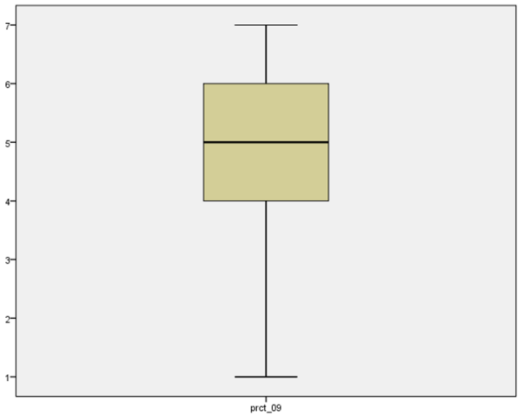
Tests of Normality

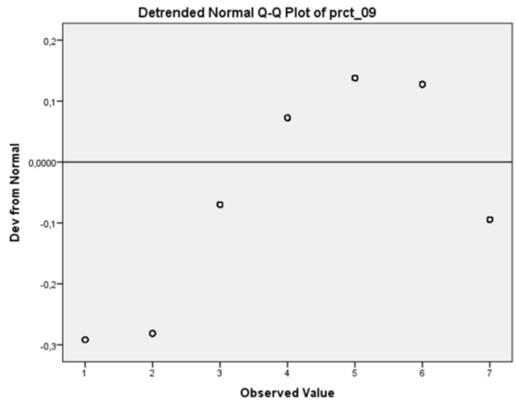
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_09	,160	394	,000	,921	394	,000

a. Lilliefors Significance Correction









APPENDIX 40 – STATISTICS FOR VARIABLE PRCT_10

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_10	393	99,7%	1	,3%	394	100,0%

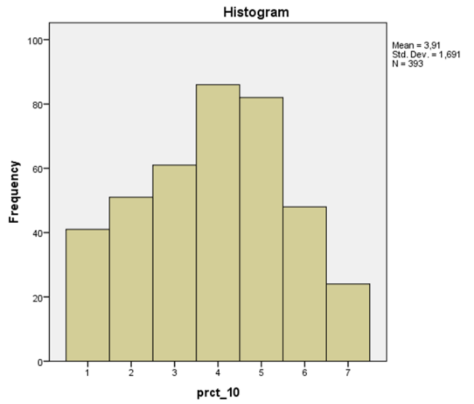
Descriptives

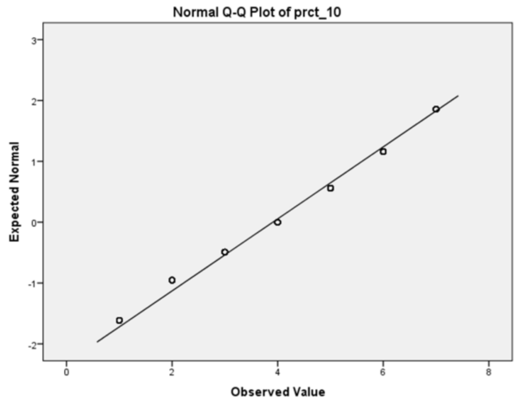
			Statistic	Std. Error
prct_10	Mean		3,91	,085
	95% Confidence Interval for Mean	Lower Bound	3,74	
		Upper Bound	4,08	
	5% Trimmed Mean		3,90	
	Median		4,00	
	Variance		2,859	
	Std. Deviation		1,691	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,082	,123
	Kurtosis		-,843	,246

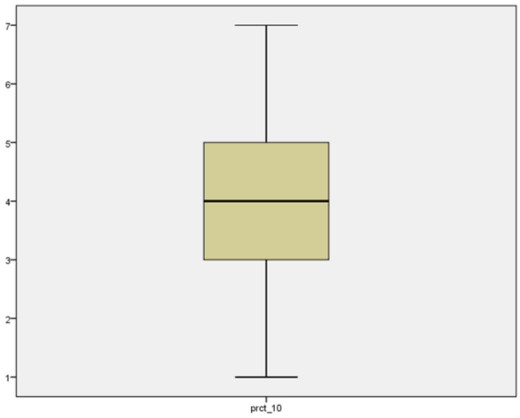
Tests of Normality

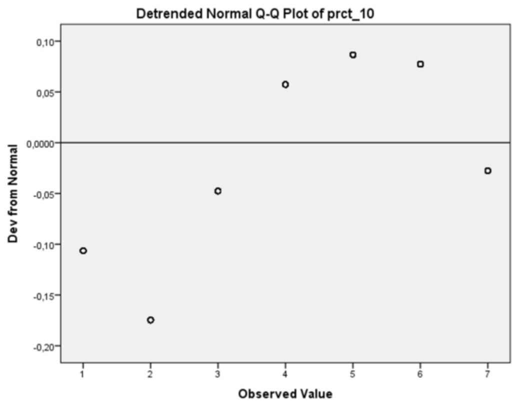
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_10	,133	393	,000	,945	393	,000

a. Lilliefors Significance Correction









APPENDIX 41 – STATISTICS FOR VARIABLE PRCT_11

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_11	394	100,0%	0	0,0%	394	100,0%

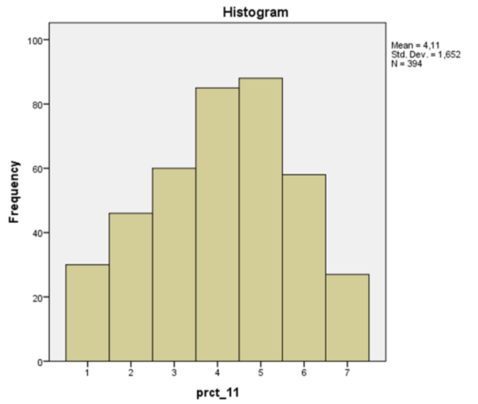
Descriptives

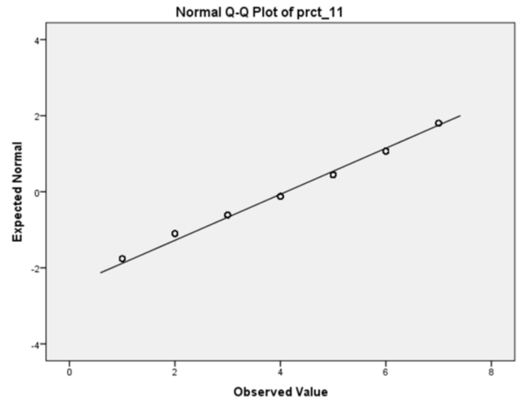
			Statistic	Std. Error
prct_11	Mean		4,11	,083
	95% Confidence Interval for Mean	Lower Bound	3,95	
		Upper Bound	4,27	
	5% Trimmed Mean		4,12	
	Median		4,00	
	Variance		2,729	
	Std. Deviation		1,652	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,175	,123
	Kurtosis		-,772	,245

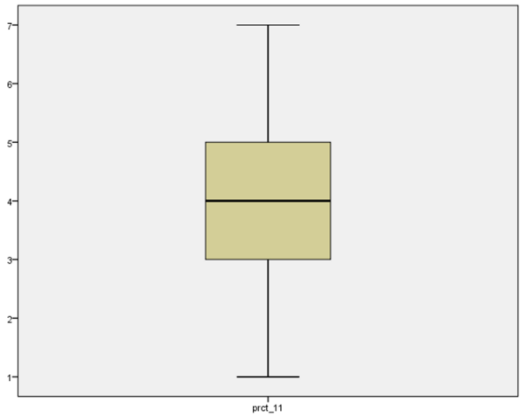
Tests of Normality

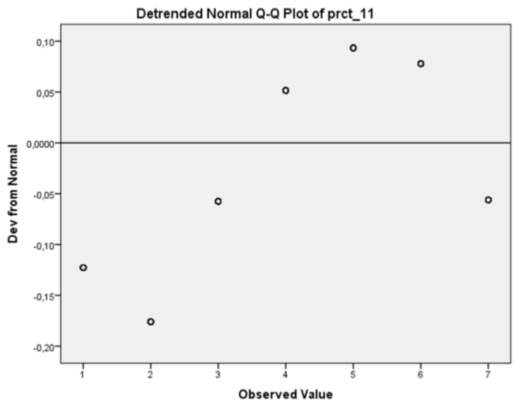
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_11	,144	394	,000	,946	394	,000

a. Lilliefors Significance Correction









APPENDIX 42 – STATISTICS FOR VARIABLE PRCT_12

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_12	393	99,7%	1	,3%	394	100,0%

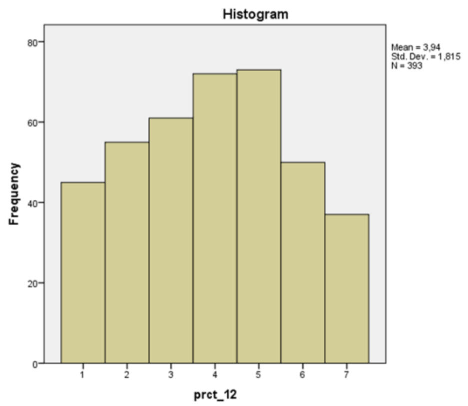
Descriptives

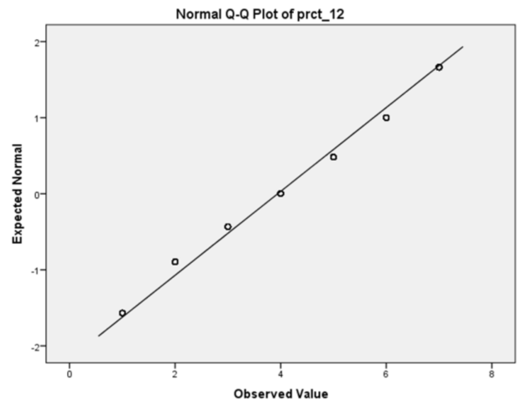
			Statistic	Std. Error
prct_12	Mean		3,94	,092
	95% Confidence Interval for Mean	Lower Bound	3,76	
		Upper Bound	4,12	
	5% Trimmed Mean		3,94	
	Median		4,00	
	Variance		3,293	
	Std. Deviation		1,815	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,012	,123
	Kurtosis		-1,010	,246

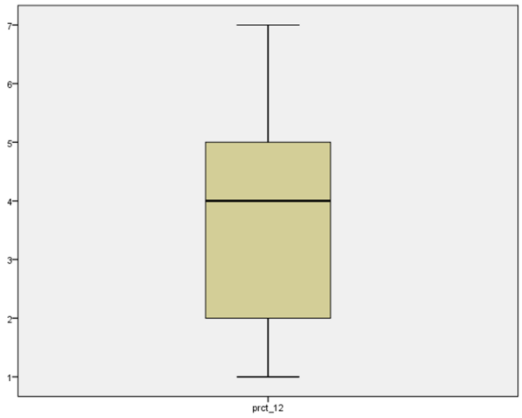
Tests of Normality

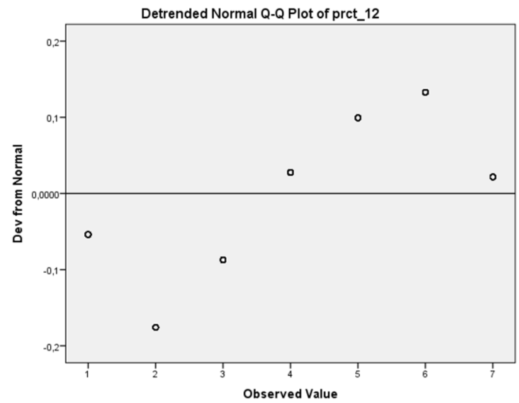
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_12	,127	393	,000	,939	393	,000

a. Lilliefors Significance Correction









APPENDIX 43 – STATISTICS FOR VARIABLE PRCT_13

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_13	393	99,7%	1	,3%	394	100,0%

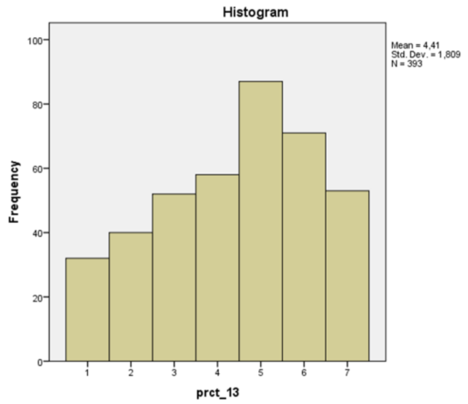
Descriptives

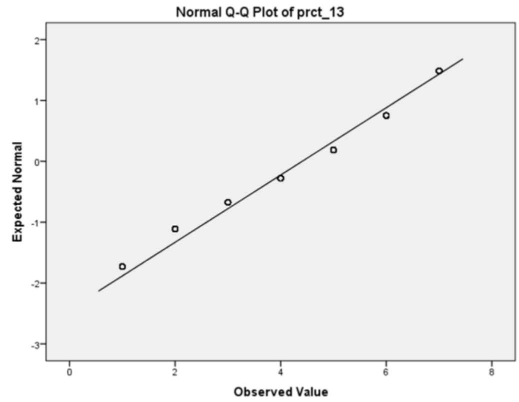
			Statistic	Std. Error
prct_13	Mean		4,41	,091
	95% Confidence Interval for Mean	Lower Bound	4,23	
		Upper Bound	4,59	
	5% Trimmed Mean		4,45	
	Median		5,00	
	Variance		3,273	
	Std. Deviation		1,809	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,322	,123
	Kurtosis		-,913	,246

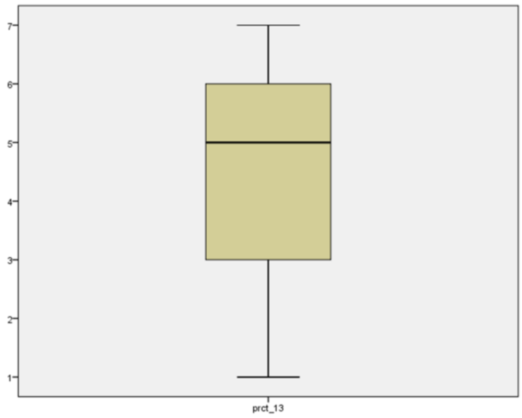
Tests of Normality

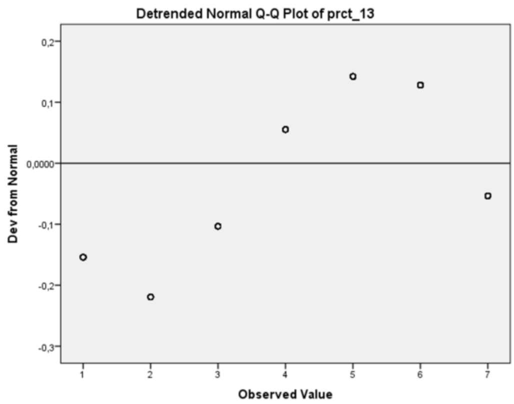
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_13	,165	393	,000	,928	393	,000

a. Lilliefors Significance Correction









APPENDIX 44 – STATISTICS FOR VARIABLE PRCT_14

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_14	392	99,5%	2	,5%	394	100,0%

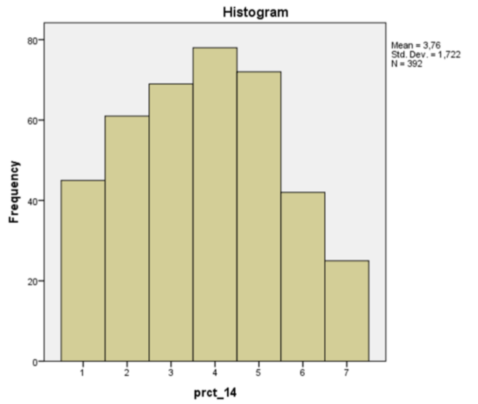
Descriptives

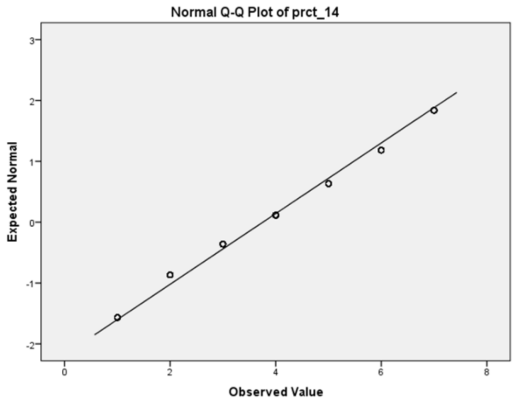
			Statistic	Std. Error
prct_14	Mean		3,76	,087
	95% Confidence Interval for Mean	Lower Bound	3,59	
		Upper Bound	3,93	
	5% Trimmed Mean		3,73	
	Median		4,00	
	Variance		2,967	
	Std. Deviation		1,722	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		,080	,123
	Kurtosis		-,897	,246

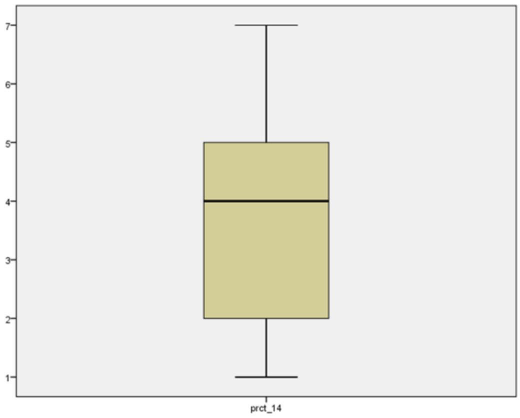
Tests of Normality

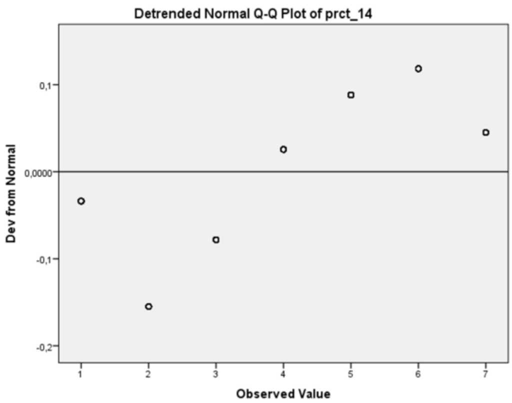
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_14	,119	392	,000	,943	392	,000

a. Lilliefors Significance Correction









APPENDIX 45 – STATISTICS FOR VARIABLE PRCT_15

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_15	393	99,7%	1	,3%	394	100,0%

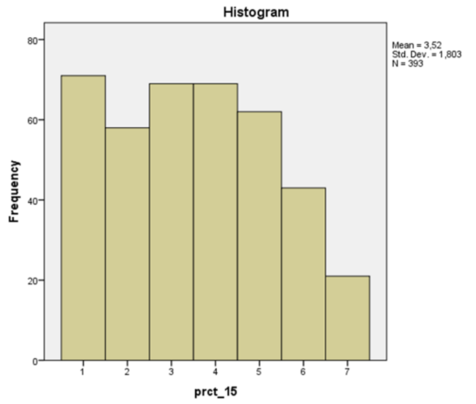
Descriptives

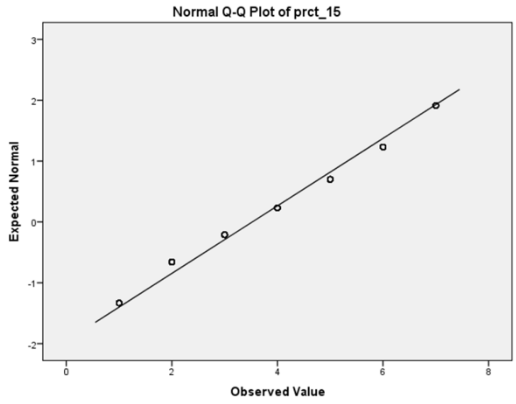
			Statistic	Std. Error
prct_15	Mean		3,52	,091
	95% Confidence Interval for Mean	Lower Bound	3,35	
		Upper Bound	3,70	
	5% Trimmed Mean		3,47	
	Median		3,00	
	Variance		3,250	
	Std. Deviation		1,803	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		,168	,123
	Kurtosis		-1,017	,246

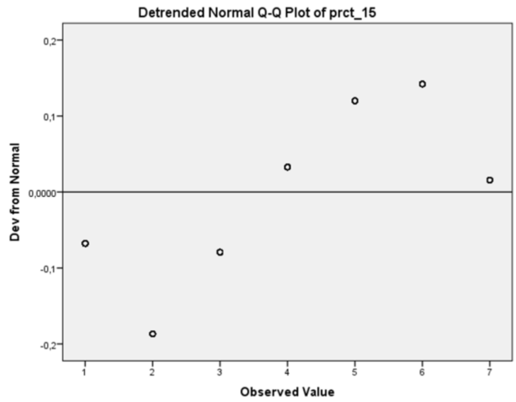
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_15	,129	393	,000	,929	393	,000

a. Lilliefors Significance Correction







APPENDIX 46 – STATISTICS FOR VARIABLE PRCT_16

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_16	393	99,7%	1	,3%	394	100,0%

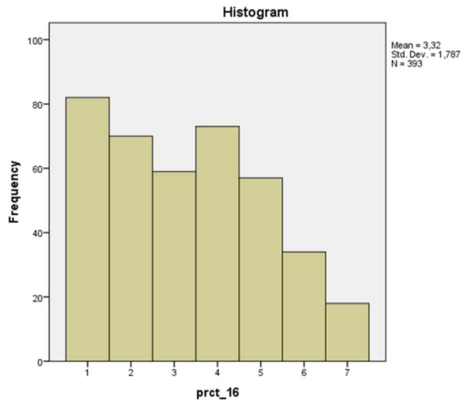
Descriptives

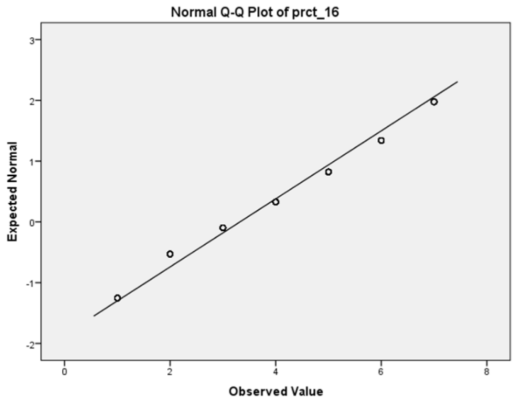
			Statistic	Std. Error
prct_16	Mean		3,32	,090
	95% Confidence Interval for Mean	Lower Bound	3,15	
		Upper Bound	3,50	
	5% Trimmed Mean		3,25	
	Median		3,00	
	Variance		3,194	
	Std. Deviation		1,787	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		,290	,123
	Kurtosis		-,965	,246

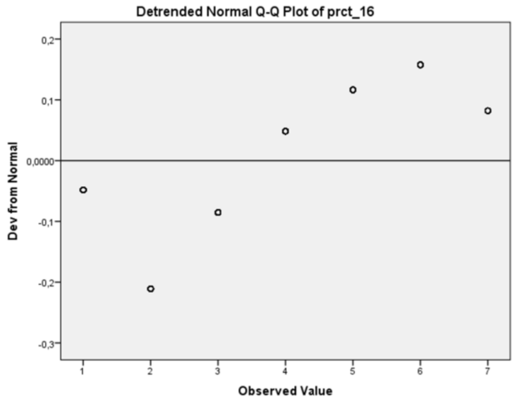
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_16	,157	393	,000	,920	393	,000

a. Lilliefors Significance Correction







APPENDIX 47 – STATISTICS FOR VARIABLE PRCT_17

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_17	394	100,0%	0	0,0%	394	100,0%

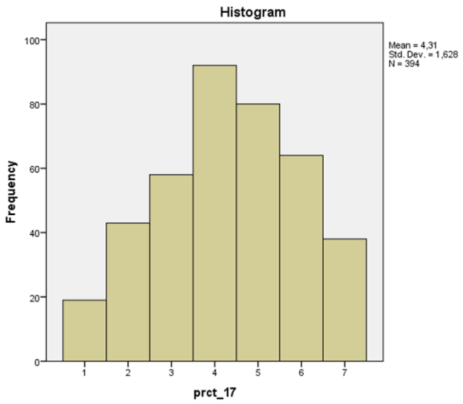
Descriptives

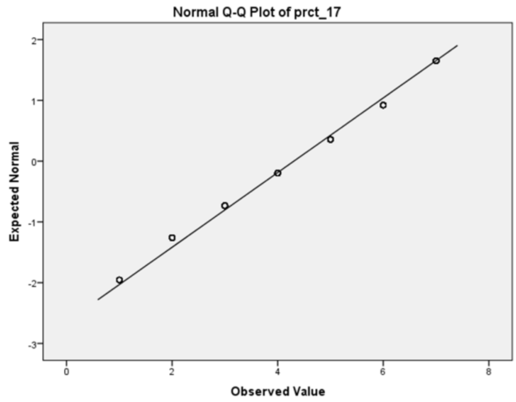
			Statistic	Std. Error
prct_17	Mean		4,31	,082
	95% Confidence Interval for Mean	Lower Bound	4,15	
		Upper Bound	4,47	
	5% Trimmed Mean		4,34	
	Median		4,00	
	Variance		2,651	
	Std. Deviation		1,628	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,159	,123
	Kurtosis		-,742	,245

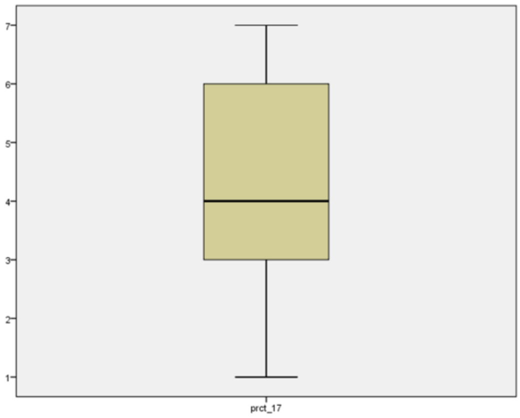
Tests of Normality

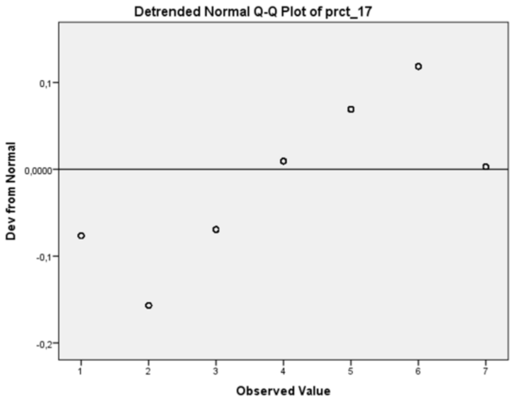
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_17	,127	394	,000	,947	394	,000

a. Lilliefors Significance Correction









APPENDIX 48 – STATISTICS FOR VARIABLE PRCT_18

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_18	394	100,0%	0	0,0%	394	100,0%

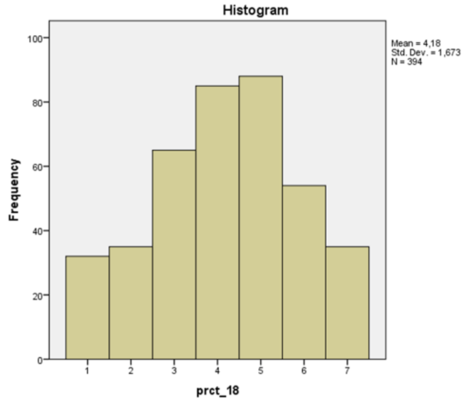
Descriptives

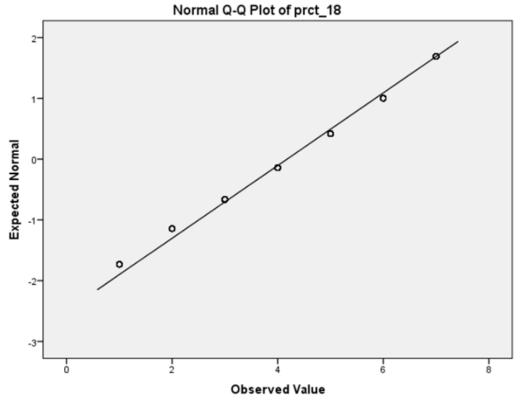
			Statistic	Std. Error
prct_18	Mean		4,18	,084
	95% Confidence Interval for Mean	Lower Bound	4,01	
		Upper Bound	4,34	
	5% Trimmed Mean		4,20	
	Median		4,00	
	Variance		2,798	
	Std. Deviation		1,673	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,182	,123
	Kurtosis		-,702	,245

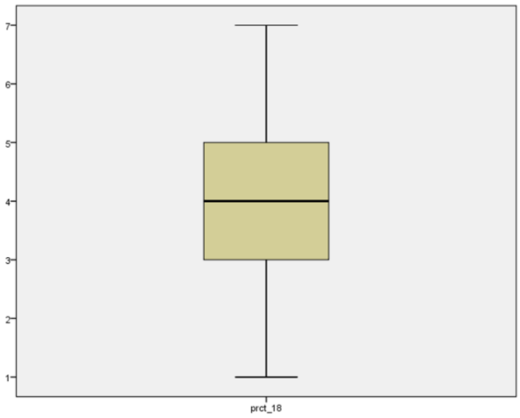
Tests of Normality

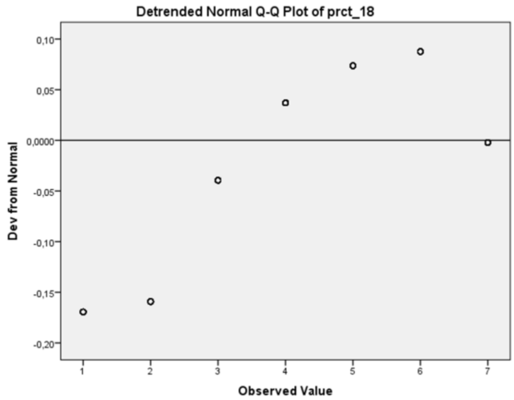
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_18	,138	394	,000	,946	394	,000

a. Lilliefors Significance Correction









APPENDIX 49 – STATISTICS FOR VARIABLE PRCT_19

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_19	394	100,0%	0	0,0%	394	100,0%

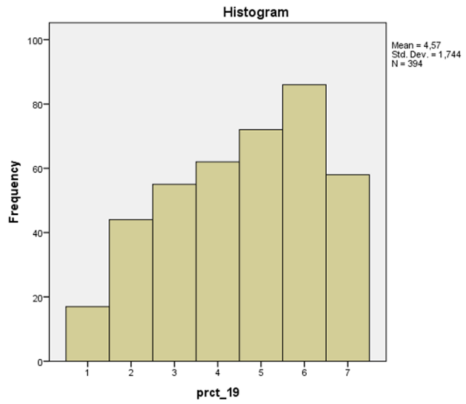
Descriptives

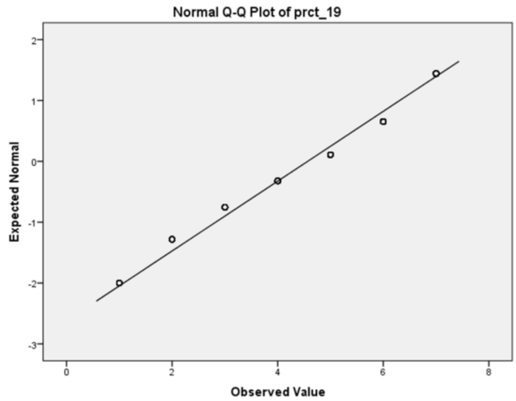
			Statistic	Std. Error
prct_19	Mean		4,57	,088
	95% Confidence Interval for Mean	Lower Bound	4,40	
		Upper Bound	4,74	
	5% Trimmed Mean		4,62	
	Median		5,00	
	Variance		3,040	
	Std. Deviation		1,744	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,314	,123
	Kurtosis		-,953	,245

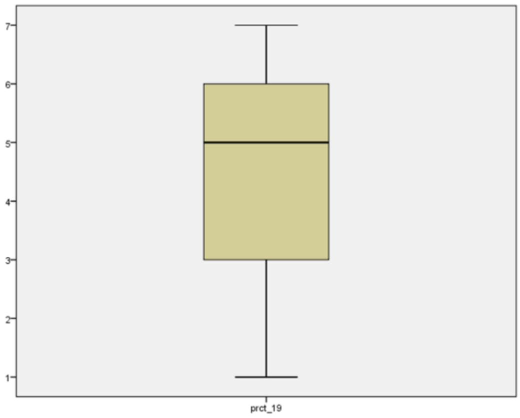
Tests of Normality

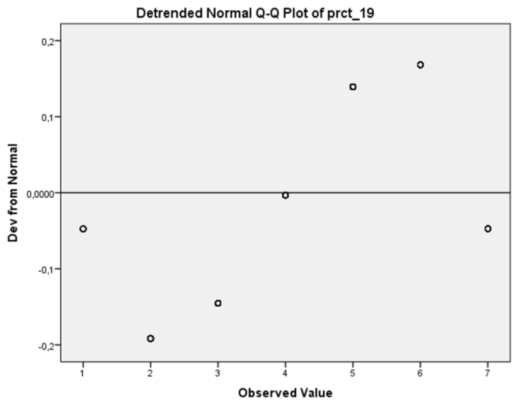
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_19	,160	394	,000	,927	394	,000

a. Lilliefors Significance Correction









APPENDIX 50 – STATISTICS FOR VARIABLE PRCT_20

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_20	394	100,0%	0	0,0%	394	100,0%

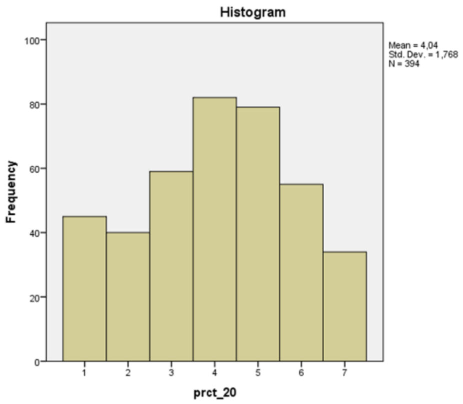
Descriptives

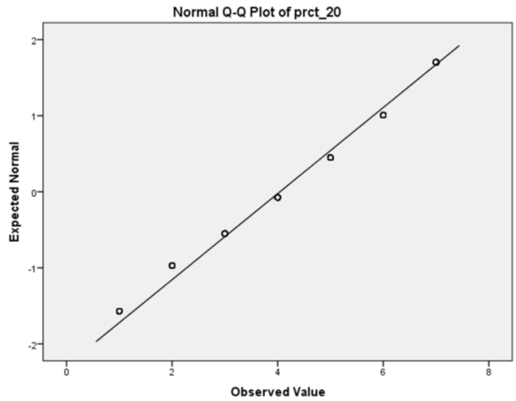
			Statistic	Std. Error
prct_20	Mean		4,04	,089
	95% Confidence Interval for Mean	Lower Bound	3,87	
		Upper Bound	4,22	
	5% Trimmed Mean		4,05	
	Median		4,00	
	Variance		3,125	
	Std. Deviation		1,768	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,146	,123
	Kurtosis		-,881	,245

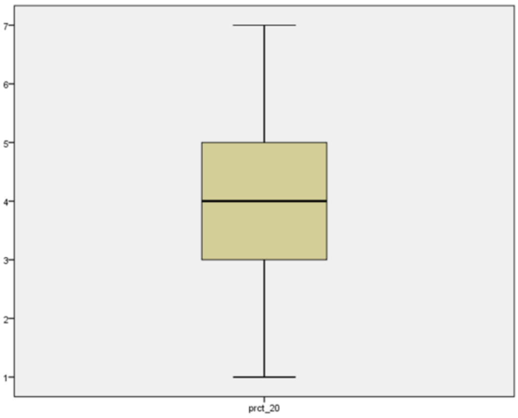
Tests of Normality

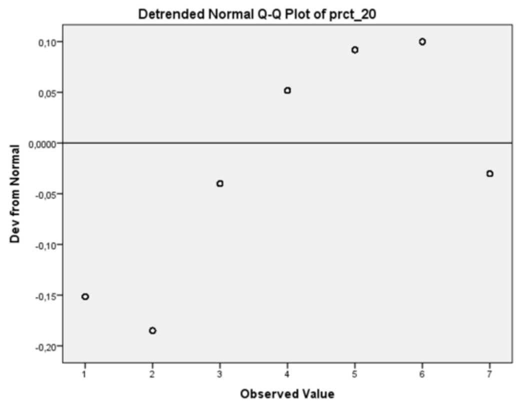
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_20	,132	394	,000	,940	394	,000

a. Lilliefors Significance Correction









APPENDIX 51 – STATISTICS FOR VARIABLE PRCT_21

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
prct_21	394	100,0%	0	0,0%	394	100,0%

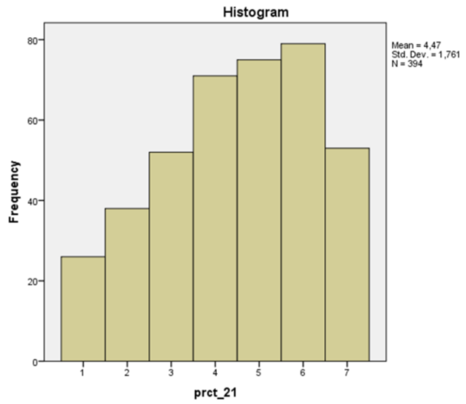
Descriptives

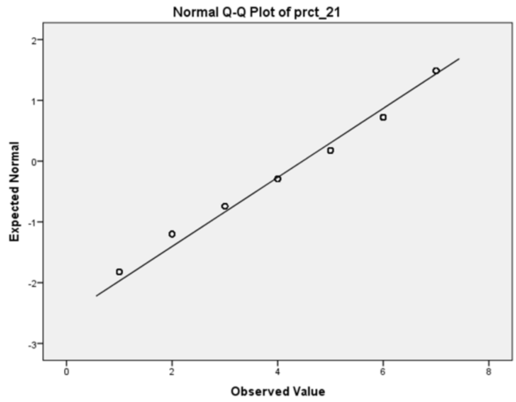
			Statistic	Std. Error
prct_21	Mean		4,47	,089
	95% Confidence Interval for Mean	Lower Bound	4,30	
		Upper Bound	4,65	
	5% Trimmed Mean		4,52	
	Median		5,00	
	Variance		3,100	
	Std. Deviation		1,761	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,322	,123
	Kurtosis		-,859	,245

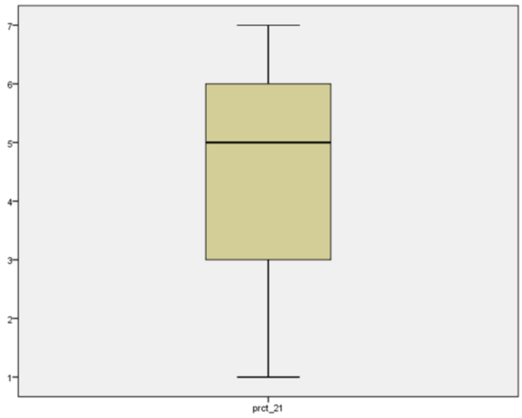
Tests of Normality

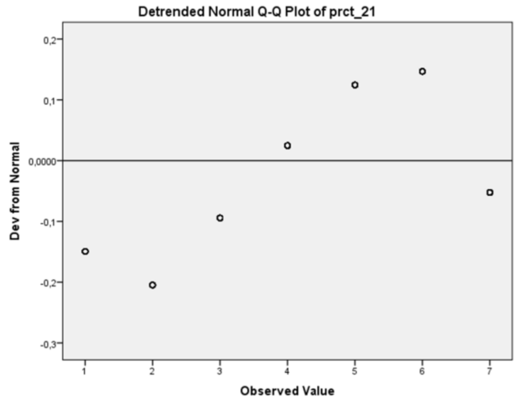
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
prct_21	,143	394	,000	,932	394	,000

a. Lilliefors Significance Correction









APPENDIX 52 – STATISTICS FOR VARIABLE INTL_01

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
intl_01	390	99,0%	4	1,0%	394	100,0%

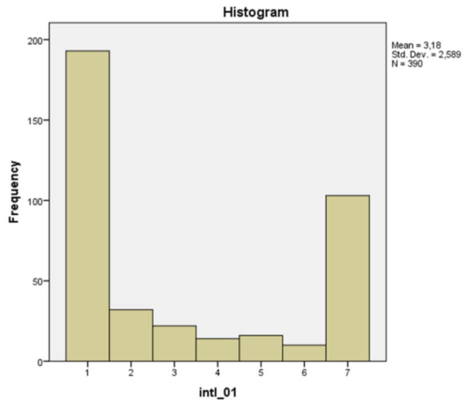
Descriptives

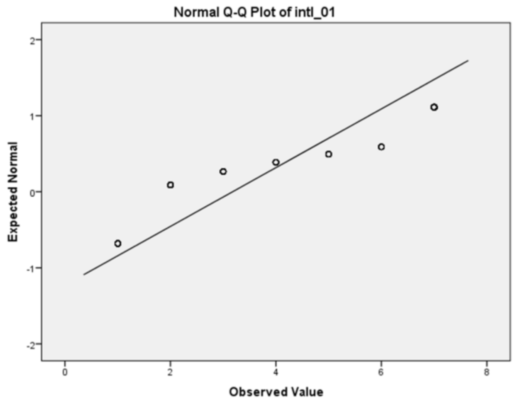
				Statistic	Std. Error
intl_01	Mean			3,18	,131
	95% Confidence Interval for Mean	Lower Bound		2,92	
		Upper Bound		3,44	
	5% Trimmed Mean			3,09	
	Median			2,00	
	Variance			6,703	
	Std. Deviation			2,589	
	Minimum			1	
	Maximum			7	
	Range			6	
	Interquartile Range			6	
	Skewness			,599	,124
	Kurtosis			-1,444	,247

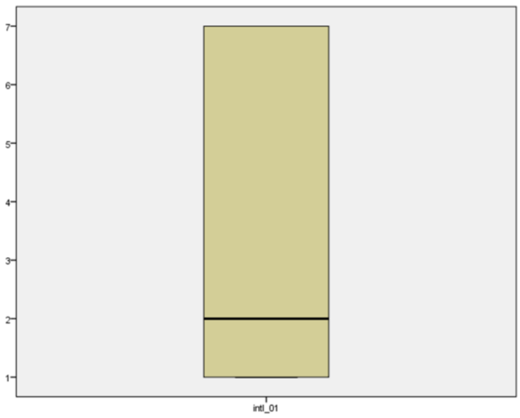
Tests of Normality

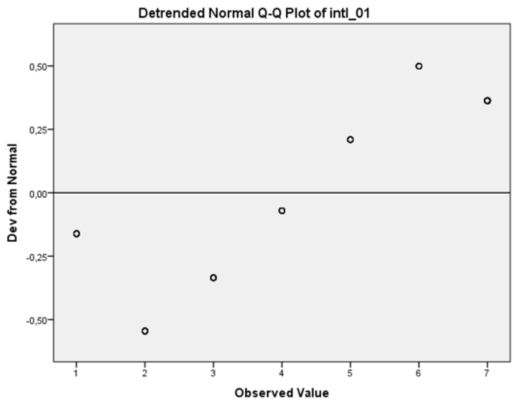
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
intl_01	,295	390	,000	,723	390	,000

a. Lilliefors Significance Correction









APPENDIX 53 – STATISTICS FOR VARIABLE INTL_02

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
intl_02	394	100,0%	0	0,0%	394	100,0%

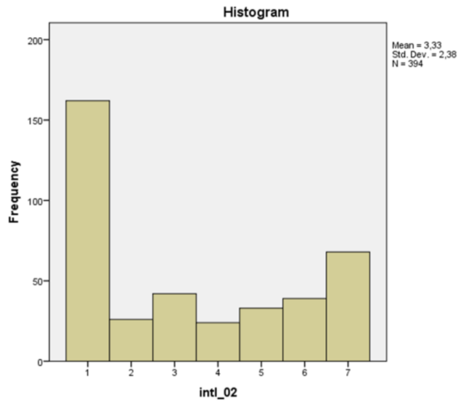
Descriptives

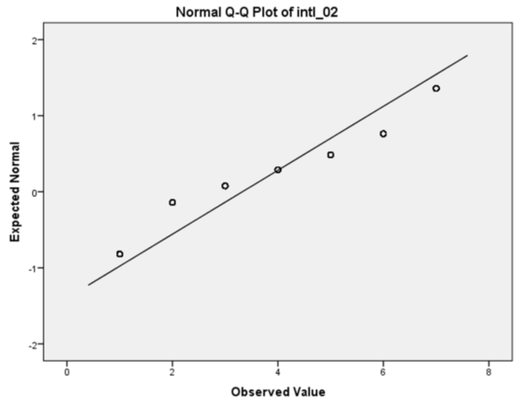
			Statistic	Std. Error
intl_02	Mean		3,33	,120
	95% Confidence Interval for Mean	Lower Bound	3,09	
		Upper Bound	3,56	
	5% Trimmed Mean		3,25	
	Median		3,00	
	Variance		5,666	
	Std. Deviation		2,380	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		5	
	Skewness		,411	,123
	Kurtosis		-1,457	,245

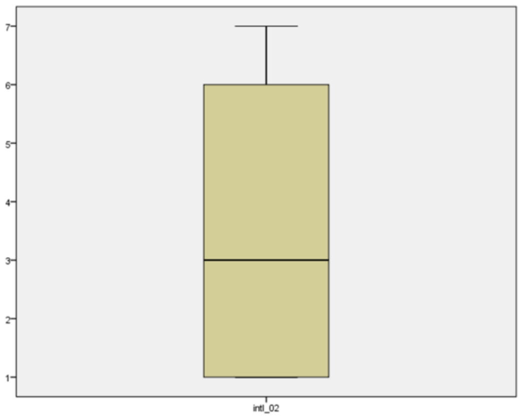
Tests of Normality

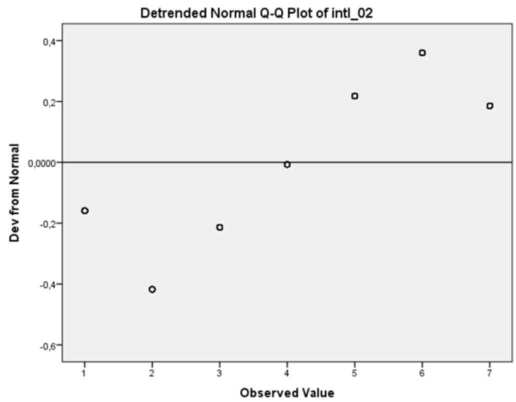
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
intl_02	,247	394	,000	,808	394	,000

a. Lilliefors Significance Correction









APPENDIX 54 – STATISTICS FOR VARIABLE INTL_03

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
intl_03	394	100,0%	0	0,0%	394	100,0%

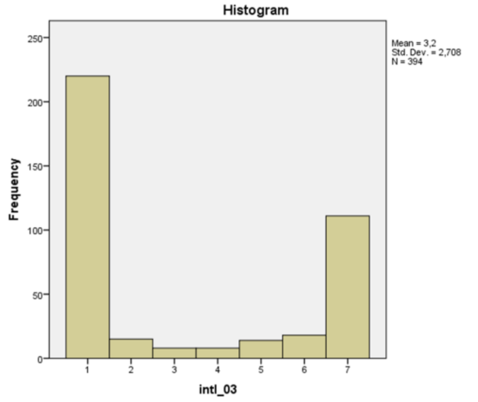
Descriptives

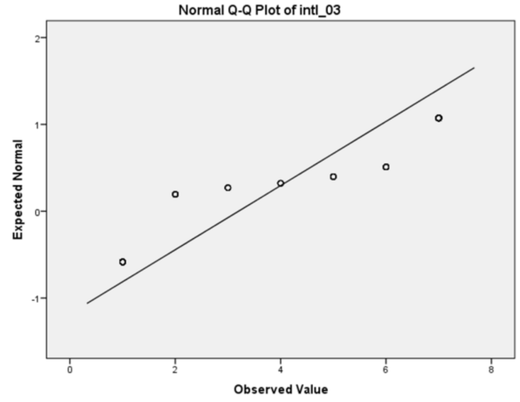
			Statistic	Std. Error
intl_03	Mean		3,20	,136
	95% Confidence Interval for Mean	Lower Bound	2,93	
		Upper Bound	3,47	
	5% Trimmed Mean		3,11	
	Median		1,00	
	Variance		7,331	
	Std. Deviation		2,708	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		6	
	Skewness		,541	,123
	Kurtosis		-1,601	,245

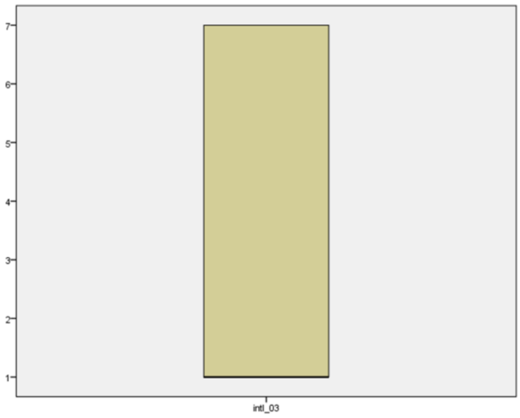
Tests of Normality

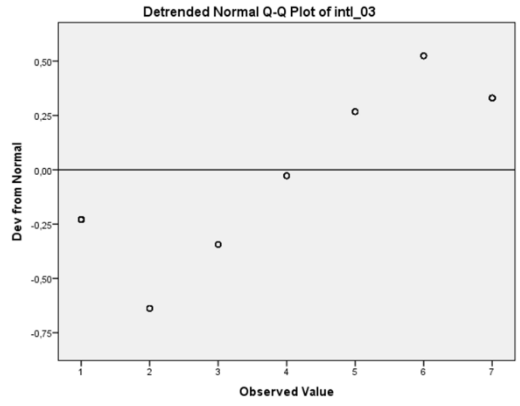
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
intl_03	,350	394	,000	,684	394	,000

a. Lilliefors Significance Correction









APPENDIX 55 – STATISTICS FOR VARIABLE INTL_04

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
intl_04	393	99,7%	1	,3%	394	100,0%

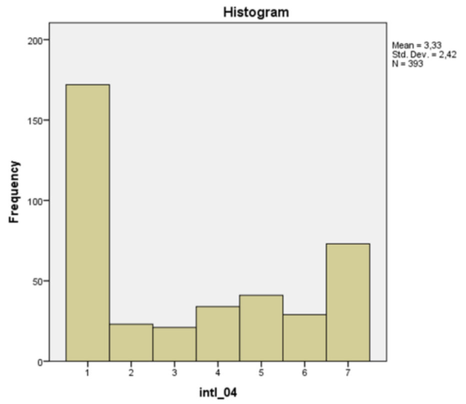
Descriptives

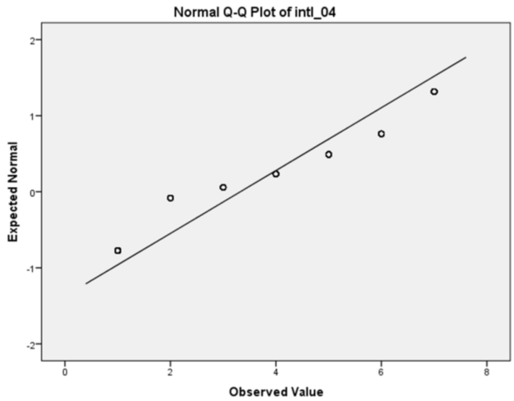
			Statistic	Std. Error
intl_04	Mean		3,33	,122
	95% Confidence Interval for Mean	Lower Bound	3,09	
		Upper Bound	3,57	
	5% Trimmed Mean		3,25	
	Median		3,00	
	Variance		5,858	
	Std. Deviation		2,420	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		5	
	Skewness		,391	,123
	Kurtosis		-1,497	,246

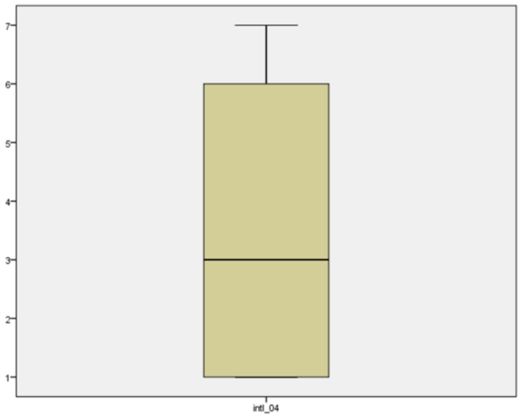
Tests of Normality

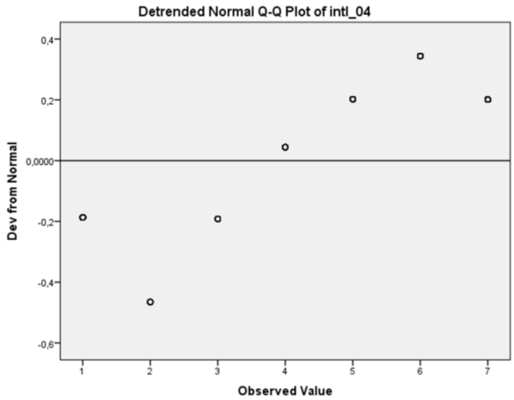
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
intl_04	,269	393	,000	,795	393	,000

a. Lilliefors Significance Correction









APPENDIX 56 – STATISTICS FOR VARIABLE INTL_05

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
intl_05	384	97,5%	10	2,5%	394	100,0%

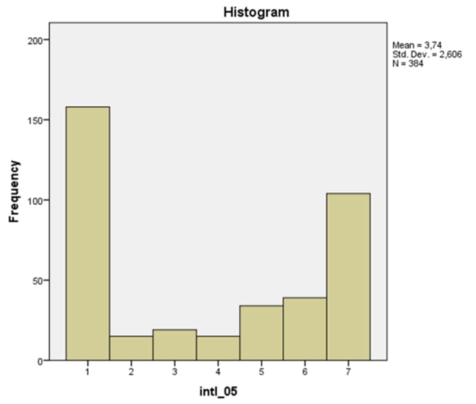
Descriptives

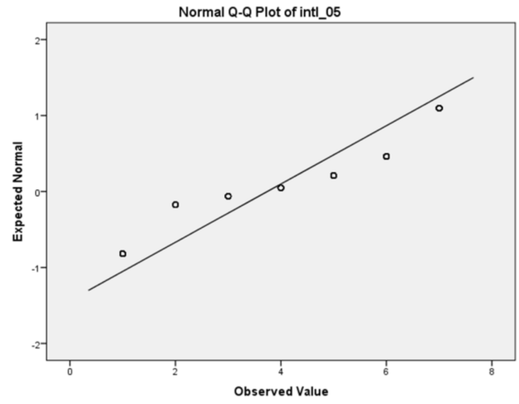
			Statistic	Std. Error
intl_05	Mean		3,74	,133
	95% Confidence Interval for Mean	Lower Bound	3,48	
		Upper Bound	4,00	
	5% Trimmed Mean		3,71	
	Median		3,50	
	Variance		6,792	
	Std. Deviation		2,606	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		6	
	Skewness		,114	,125
	Kurtosis		-1,765	,248

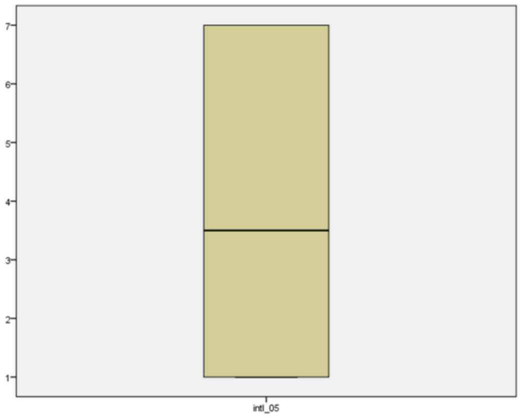
Tests of Normality

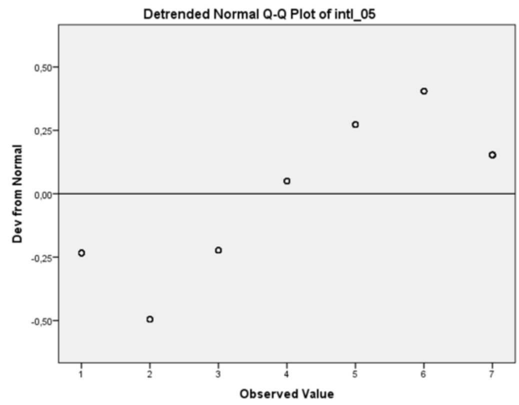
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
intl_05	,265	384	,000	,774	384	,000

a. Lilliefors Significance Correction









APPENDIX 57 – STATISTICS FOR VARIABLE INTL_06

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
intl_06	379	96,2%	15	3,8%	394	100,0%

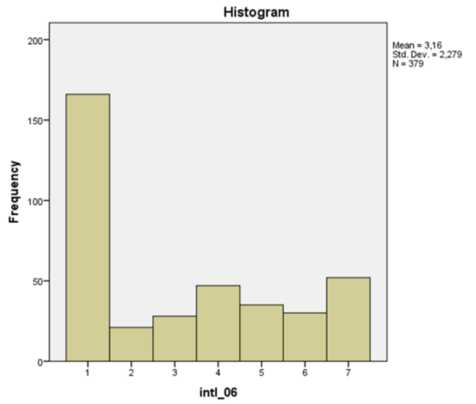
Descriptives

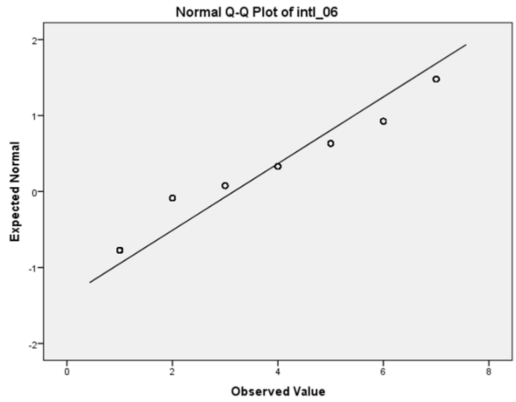
			Statistic	Std. Error
intl_06	Mean		3,16	,117
	95% Confidence Interval for Mean	Lower Bound	2,93	
		Upper Bound	3,39	
	5% Trimmed Mean		3,07	
	Median		3,00	
	Variance		5,195	
	Std. Deviation		2,279	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		4	
	Skewness		,483	,125
	Kurtosis		-1,301	,250

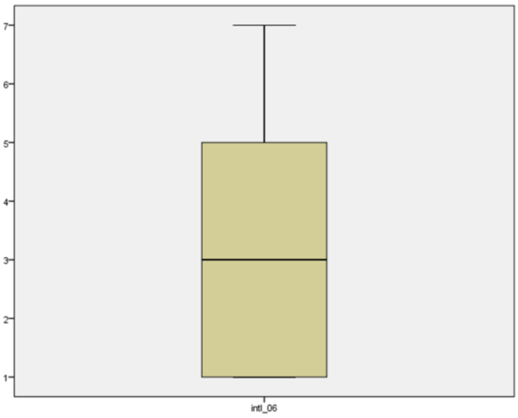
Tests of Normality

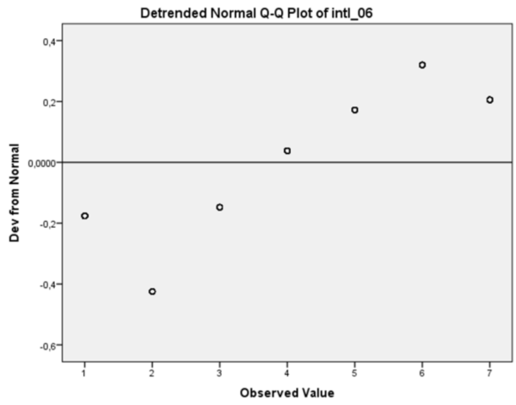
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
intl_06	,267	379	,000	,812	379	,000

a. Lilliefors Significance Correction









APPENDIX 58 – STATISTICS FOR VARIABLE INTL_ME

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
intl_me	394	100,0%	0	0,0%	394	100,0%

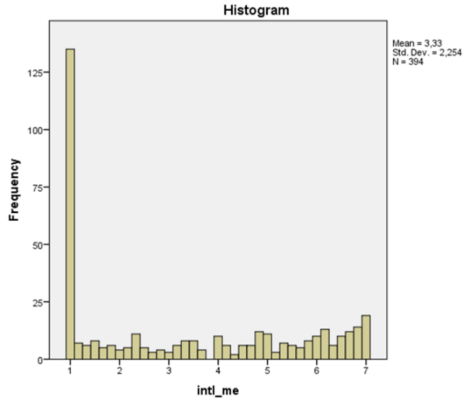
Descriptives

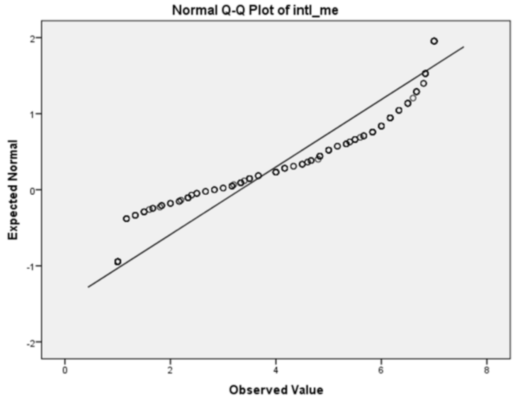
			Statistic	Std. Error
intl_me	Mean		3,33	,114
	95% Confidence Interval for Mean	Lower Bound	3,10	
		Upper Bound	3,55	
	5% Trimmed Mean		3,25	
	Median		2,83	
	Variance		5,082	
	Std. Deviation		2,254	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		5	
	Skewness		,329	,123
	Kurtosis		-1,499	,245

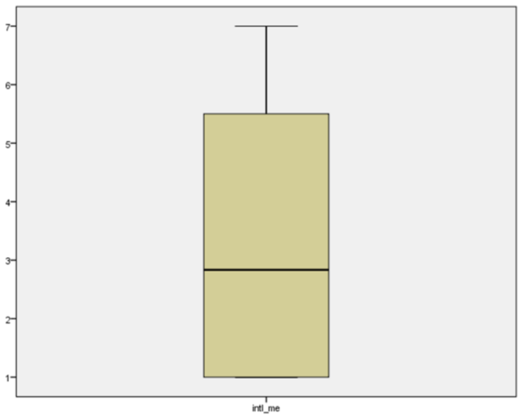
Tests of Normality

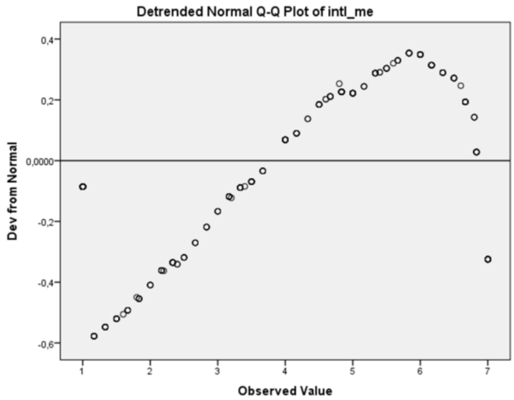
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
intl_me	,192	394	,000	,838	394	,000

a. Lilliefors Significance Correction









APPENDIX 59 – STATISTICS FOR VARIABLE PERF_01

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_01	390	99,0%	4	1,0%	394	100,0%

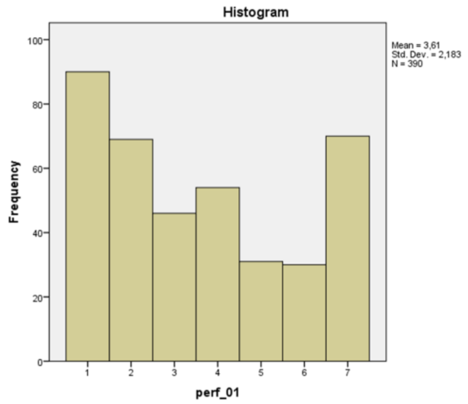
Descriptives

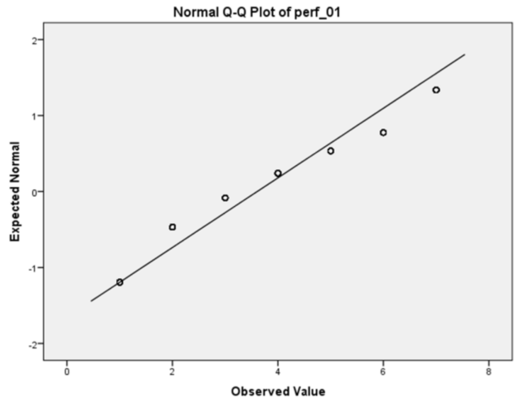
			Statistic	Std. Error
perf_01	Mean		3,61	,111
	95% Confidence Interval for Mean	Lower Bound	3,39	
		Upper Bound	3,82	
	5% Trimmed Mean		3,56	
	Median		3,00	
	Variance		4,763	
	Std. Deviation		2,183	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		4	
	Skewness		,332	,124
	Kurtosis		-1,298	,247

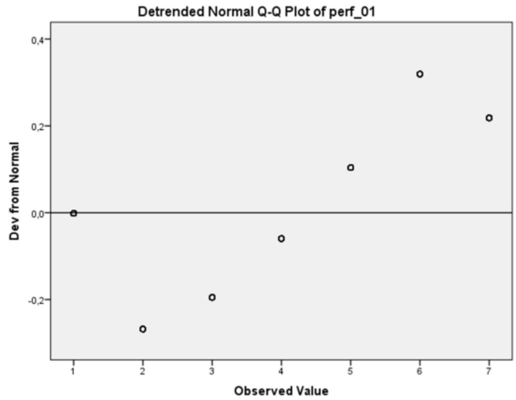
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_01	,177	390	,000	,875	390	,000

a. Lilliefors Significance Correction







APPENDIX 60 – STATISTICS FOR VARIABLE PERF_02

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_02	387	98,2%	7	1,8%	394	100,0%

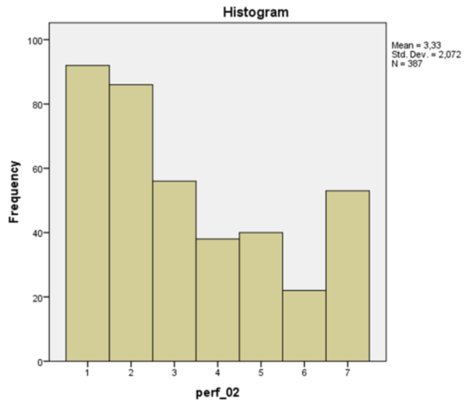
Descriptives

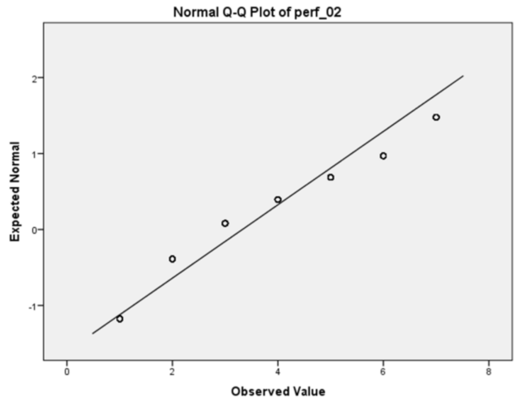
			Statistic	Std. Error
perf_02	Mean		3,33	,105
	95% Confidence Interval for Mean	Lower Bound	3,12	
		Upper Bound	3,53	
	5% Trimmed Mean		3,25	
	Median		3,00	
	Variance		4,293	
	Std. Deviation		2,072	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		,553	,124
	Kurtosis		-1,015	,247

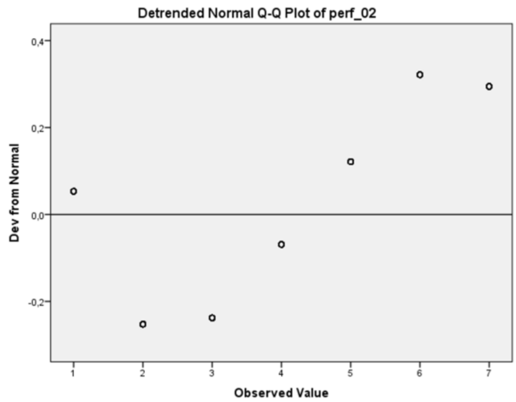
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_02	,199	387	,000	,871	387	,000

a. Lilliefors Significance Correction







APPENDIX 61 – STATISTICS FOR VARIABLE PERF_03

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_03	393	99,7%	1	,3%	394	100,0%

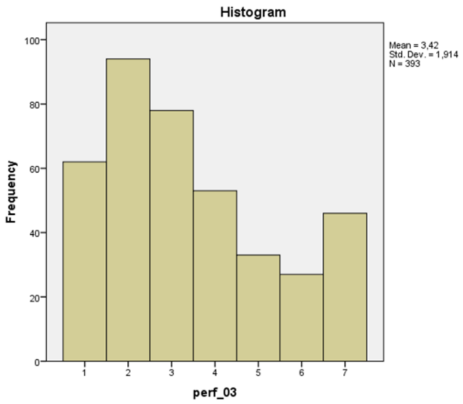
Descriptives

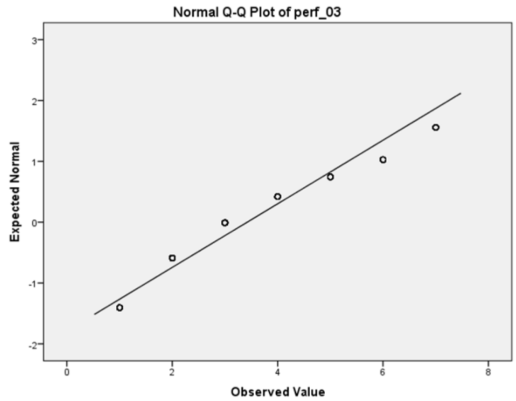
				Statistic	Std. Error
perf_03	Mean			3,42	,097
	95% Confidence Interval for Mean	Lower Bound		3,23	
		Upper Bound		3,61	
	5% Trimmed Mean			3,36	
	Median			3,00	
	Variance			3,663	
	Std. Deviation			1,914	
	Minimum			1	
	Maximum			7	
	Range			6	
	Interquartile Range			3	
	Skewness			,567	,123
	Kurtosis			-,811	,246

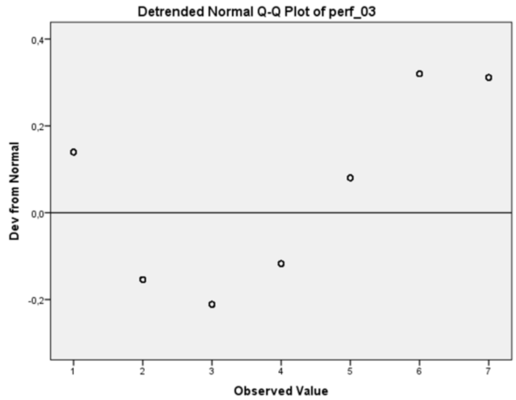
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_03	,183	393	,000	,895	393	,000

a. Lilliefors Significance Correction







APPENDIX 62 – STATISTICS FOR VARIABLE PERF_04

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_04	394	100,0%	0	0,0%	394	100,0%

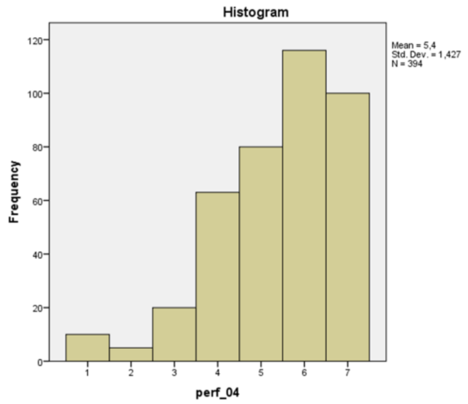
Descriptives

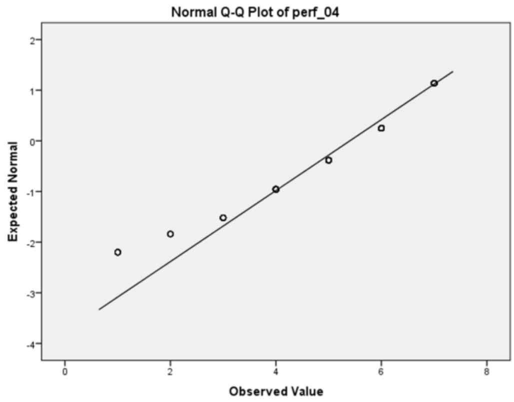
			Statistic	Std. Error
perf_04	Mean		5,40	,072
	95% Confidence Interval for Mean	Lower Bound	5,26	
		Upper Bound	5,54	
	5% Trimmed Mean		5,52	
	Median		6,00	
	Variance		2,037	
	Std. Deviation		1,427	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,942	,123
	Kurtosis		,711	,245

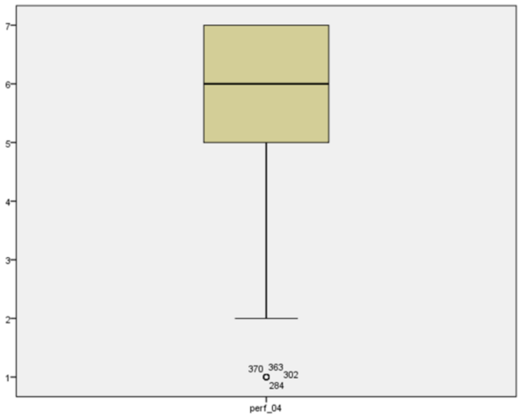
Tests of Normality

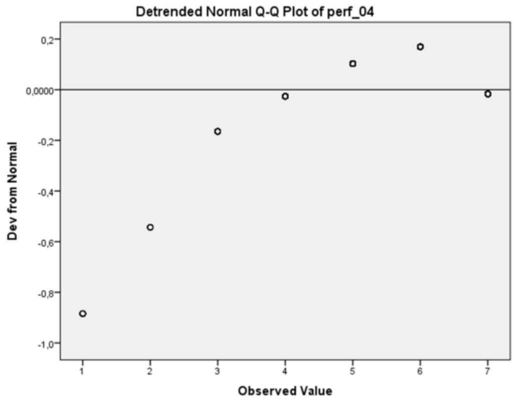
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_04	,211	394	,000	,878	394	,000

a. Lilliefors Significance Correction









APPENDIX 63 – STATISTICS FOR VARIABLE PERF_05

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_05	393	99,7%	1	,3%	394	100,0%

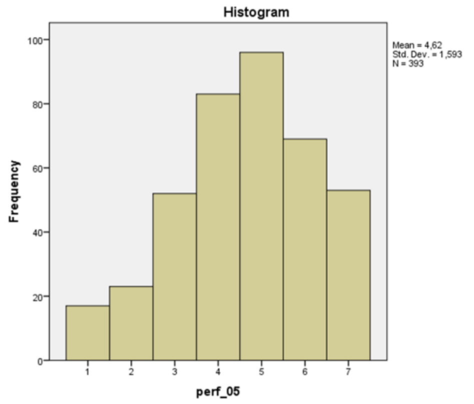
Descriptives

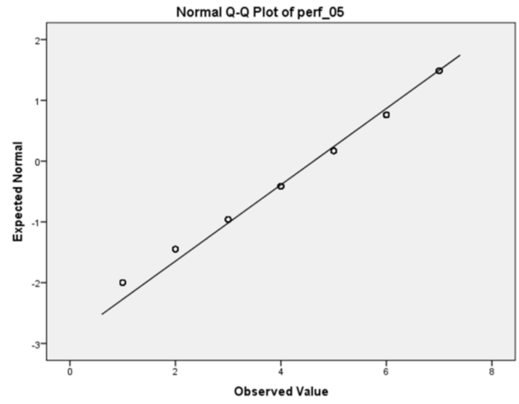
			Statistic	Std. Error
perf_05	Mean		4,62	,080
	95% Confidence Interval for Mean	Lower Bound	4,46	
		Upper Bound	4,78	
	5% Trimmed Mean		4,68	
	Median		5,00	
	Variance		2,537	
	Std. Deviation		1,593	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,357	,123
	Kurtosis		-,476	,246

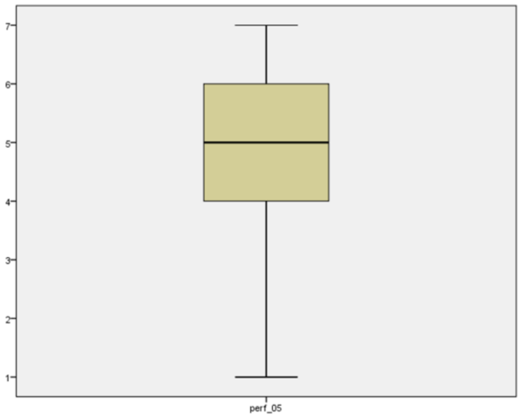
Tests of Normality

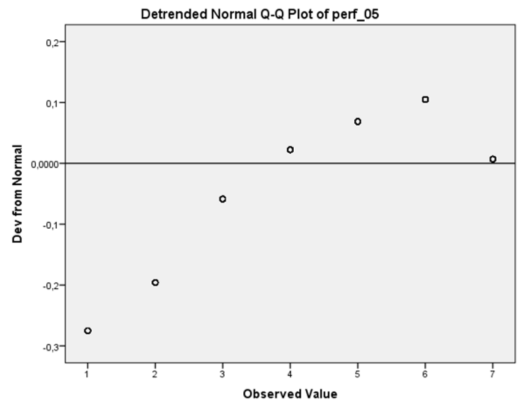
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_05	,149	393	,000	,939	393	,000

a. Lilliefors Significance Correction









APPENDIX 64 – STATISTICS FOR VARIABLE PERF_06

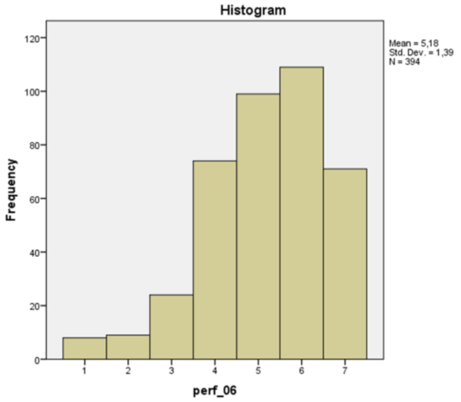
Descriptives

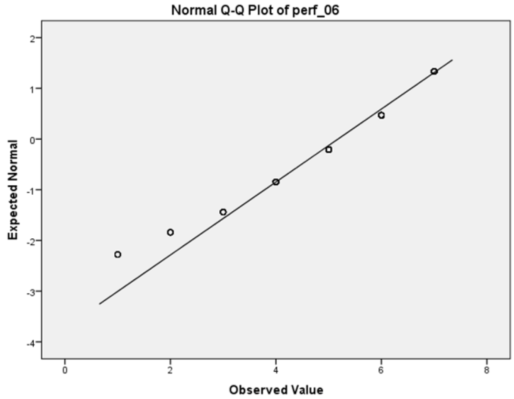
			Statistic	Std. Error
perf_06	Mean		5,18	,070
	95% Confidence Interval for Mean	Lower Bound	5,04	
		Upper Bound	5,32	
	5% Trimmed Mean		5,27	
	Median		5,00	
	Variance		1,933	
	Std. Deviation		1,390	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,715	,123
	Kurtosis		,345	,245

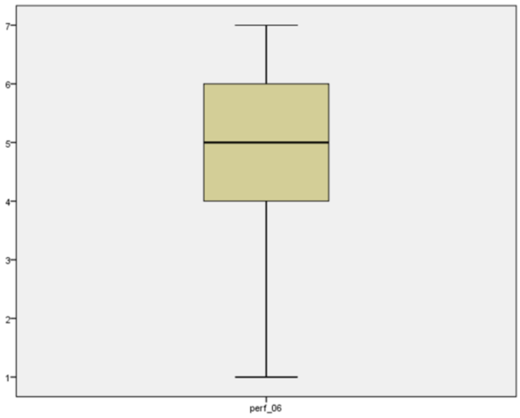
Tests of Normality

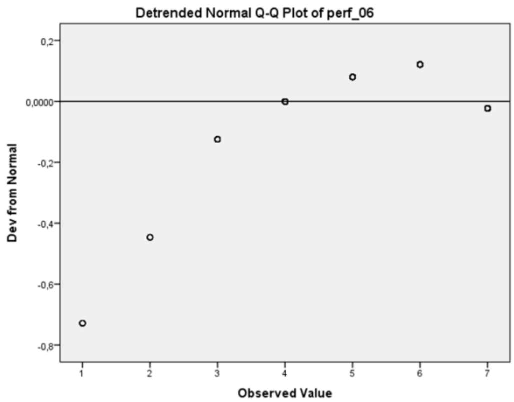
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_06	,180	394	,000	,909	394	,000

a. Lilliefors Significance Correction









APPENDIX 65 – STATISTICS FOR VARIABLE PERF_07

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_07	393	99,7%	1	,3%	394	100,0%

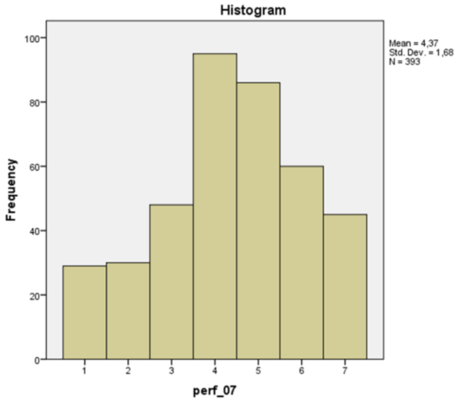
Descriptives

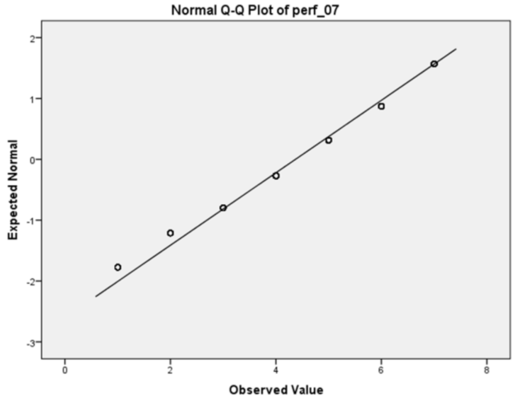
			Statistic	Std. Error
perf_07	Mean		4,37	,085
	95% Confidence Interval for Mean	Lower Bound	4,20	
		Upper Bound	4,54	
	5% Trimmed Mean		4,41	
	Median		4,00	
	Variance		2,821	
	Std. Deviation		1,680	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,294	,123
	Kurtosis		-,597	,246

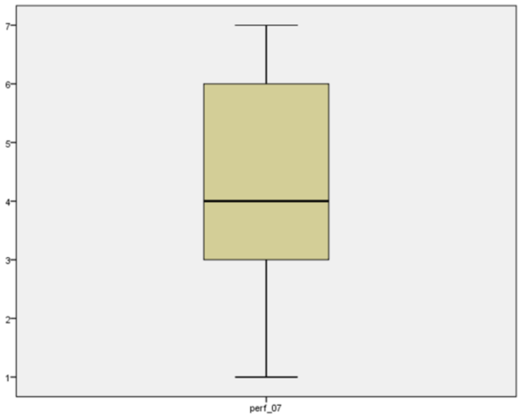
Tests of Normality

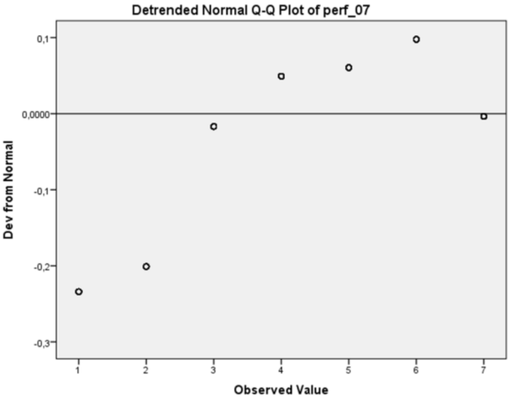
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_07	,140	393	,000	,940	393	,000

a. Lilliefors Significance Correction









APPENDIX 66 – STATISTICS FOR VARIABLE PERF_08

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_08	391	99,2%	3	,8%	394	100,0%

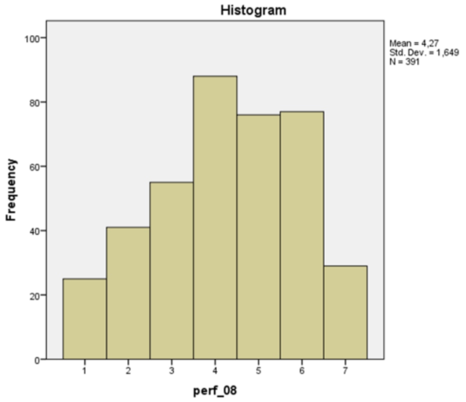
Descriptives

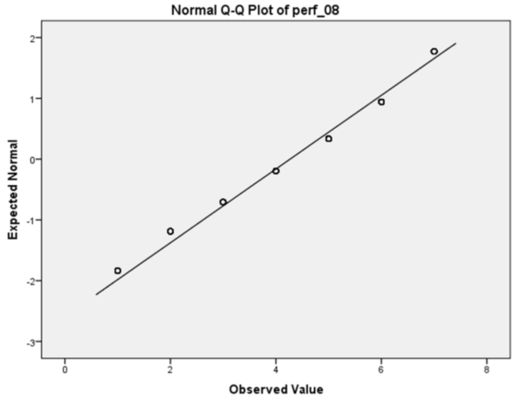
			Statistic	Std. Error
perf_08	Mean		4,27	,083
	95% Confidence Interval for Mean	Lower Bound	4,10	
		Upper Bound	4,43	
	5% Trimmed Mean		4,30	
	Median		4,00	
	Variance		2,720	
	Std. Deviation		1,649	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		3	
	Skewness		-,256	,123
	Kurtosis		-,767	,246

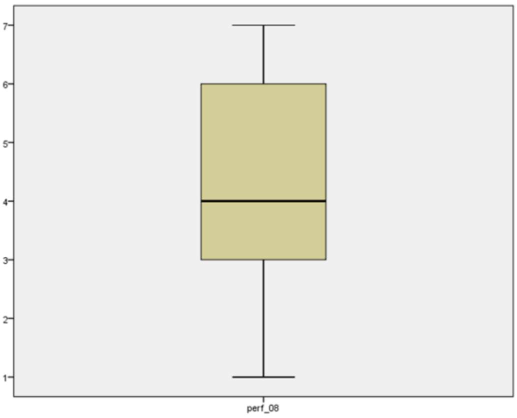
Tests of Normality

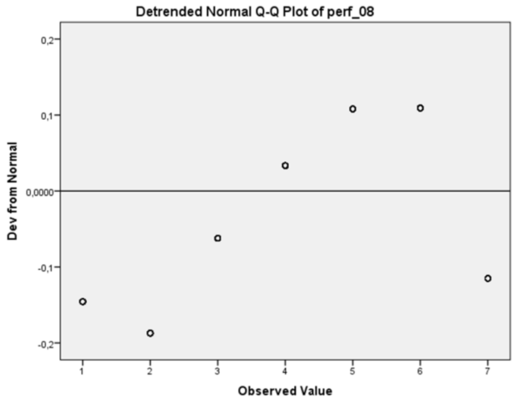
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_08	,137	391	,000	,942	391	,000

a. Lilliefors Significance Correction









APPENDIX 67 – STATISTICS FOR VARIABLE PERF_ME

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
perf_me	394	100,0%	0	0,0%	394	100,0%

Descriptives

			Statistic	Std. Error
perf_me	Mean		4,28	,055
	95% Confidence Interval for Mean	Lower Bound	4,17	
		Upper Bound	4,39	
	5% Trimmed Mean		4,29	
	Median		4,13	
	Variance		1,204	
	Std. Deviation		1,097	
	Minimum		1	
	Maximum		7	
	Range		6	
	Interquartile Range		2	
	Skewness		-,067	,123
	Kurtosis		-,044	,245

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
perf_me	,055	394	,006	,987	394	,002

a. Lilliefors Significance Correction