Radboud University

The Impact of Institutional Voids, Resources, and Degree of Internationalisation on Innovation in Emerging Markets

A master thesis in Business Administration

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1. Introduction

"*The emerging world,*
long a source of cheap labor,
now rivals the rich countries for business innovation."[1]

This quote originates from 2010, but now, in 2017, its message is even more apparent. The emerging world is becoming more and more important. Emerging economies are rising (Govindarajan & Ramamurti, 2011). Emerging economies are liberalizing, growing and globalizing (Khanna & Palepu, 2010). In 2006, around 10 % of the Fortune Global 500 list were enterprises from emerging markets. Ten years later, in 2016, this percentage has gone up to 30 % (Casanova & Miroux, December 8, 2016). The gap between emerging economies and developed countries is closing (Khanna & Palepu, 2010). Interestingly, emerging markets are growing, while growth in developed markets is slowing down (Ramamurti, 2012). As Ramamurti (2012) put it: emerging markets are the world's growth engines, even for multinationals from developed markets (Khanna & Palepu, 2010). Concluding, emerging markets are very relevant, for multinational enterprises (hereafter: MNEs) from these markets, as well as for developed market MNEs investing in them.

1.1 Innovation in emerging markets

In particular, there is evidence that emerging economies are innovating more than ever and that these innovation activities are still growing (Govindarajan & Ramamurti, 2011). Innovation, in general, is essential for a number of reasons. It enhances competitive advantage (Barasa, Knoben, Vermeulen, Kimuyu & Kinuthia, 2017; Chadee & Roxas, 2013; Goedhuys, 2007; Ritter, Vermeulen & Knoben, 2016), and stimulates the productivity of firms (Barasa et al., 2017; Crespi & Zuñiga, 2012). However, it should be noted that some studies fail to confirm the relationship between innovation and productivity (see Bogliacino, Perani, Pianta & Supino, 2009). Innovation leads to economic growth (Barasa et al., 2017; Goedhuys & Veugelers, 2012; Mahemba & De Bruijn, 2003), and economic efficiency (Chadee & Roxas, 2013). It has a positive relationship with labour productivity (Chudnovsky, Lopéz & Pupato, 2006; Crespi & Zuñiga, 2012) and with business performance (Bradley, McMullen, Artz &

[1] The Economist (April 15, 2010).

Simiyu, 2012; Hult, Hurley & Knight, 2004; Mahemba & De Bruijn, 2003), and it expands market share (Ritter et al., 2016).

Innovation is specifically essential for emerging markets (Ritter et al., 2016), as firms in emerging markets search for new products that suit these markets (Goedhuys, 2007). Innovation is seen as an important form of technical change in emerging markets (Goedhuys, 2007) and as an important contributor to income growth and to the introduction of better living standards (Bradley et al., 2012; Organisation for Economic Co-operation and Development, 2012). This notion is not always acknowledged by mainstream economists and in the international business (hereafter: IB) literature (Chudnovsky et al., 2006; Govindarajan & Ramamurti, 2011), and most research on innovation has been conducted with data from developed countries (Ayyagari, Demirgüç-Kunt & Maksimovic, 2012; Chudnovsky et al., 2006; Hadjimanolis, 2000a; 2000b; Robson, Haugh & Obeng, 2008). Recently there has been some research on innovation in emerging countries (Bogliacino et al., 2009; Bradley et al., 2012; Fagerberg, Srholec & Verspagen, 2010; Govindarajan & Ramamurti, 2011). From this research, it has become clear that innovation in emerging markets differs from innovation in developed markets (Bogliacino et al., 2009; Bradley et al., 2012; Goedhuys & Veugelers, 2012; Khanna, Palepu & Sinha, 2005). This difference is largely due to the characteristics that distinguish emerging markets from developed markets. This begs us to define emerging markets.

1.2 Emerging markets

What makes a market emerging? Emerging markets are poor, under-developed markets, with unsophisticated customers and weak suppliers (Ramamurti & Singh, 2009). In emerging markets, hard and soft infrastructure are lacking, and well-established formalised institutions do not exist. At the same time, emerging markets are characterized by high economic growth rates (Luo & Tung, 2007). Khanna and Palepu (2010), who studied emerging markets in depth (see Fisman & Khanna, 2004; Khanna & Palepu 1997; 1999; 2000; 2005; 2006; 2010; Khanna et al., 2005; Khanna & Yafeh, 2007) define them as those markets where specialized intermediaries that support transactions are absent or poorly functioning. Emerging markets are characterized by "the absence of specialized intermediaries, regulatory systems, and contract-enforcing mechanisms" (Khanna et al., 2005, p. 63), what they call institutional voids.

Examples of institutional voids are poor local infrastructure, an underdeveloped communications network, slow and capricious law enforcement, the absence of strong educational institutions, ineffective securities regulations and a lack of well-defined property rights (Khanna & Palepu, 1997). Khanna and Palepu (2010) provide a systematic approach to institutional voids and distinguish four types: macro voids, product market voids, labour market voids, and capital market voids. Thus, voids can have different forms. They play an important role in shaping product, labour, and capital markets and have major implications on the operations of firms in emerging markets (Khanna & Palepu, 2010). The predominant view, on the one hand, is that institutional voids are constraints (Doh, Rodrigues, Saka-Helmhout & Makhija, 2017; Khanna & Palepu, 2010; Nkya, 2003; Rodrik, 2000; Schmieding, 1991). A second and less popular view focuses on the enabling role of institutional voids (Mair & Marti, 2009; Mair, Marti & Ventresca, 2012; McKague, Zietsma & Oliver, 2015; Venkataraman, Vermeulen, Raaijmakers & Mair, 2016). This study employs the first view, that is discussed in the next section.

1.3 The constraining character of institutional voids

Markets need institutions to function adequately (North, 1990). In emerging markets, institutional voids are present, leading to information asymmetry between buyers and sellers, which in turn enhances transaction costs (Khanna & Palepu, 2010; Doh et al., 2017; North, 1987; Zhu, Wittman & Peng, 2011). The broader institutional context in which a firm operates is an important driver for innovation (Chadee & Roxas, 2013; Goedhuys, 2007), and the role of context for innovation was already provided by Schumpeter in 1934 (Srholec, 2011). Institutional voids, in particular, play an important role for innovation as well, by enhancing transaction costs, they can constrain innovation (Doh et al., 2017). This constraining role is established by Anokhin and Schulze (2009), Chadee and Roxas (2013), Srholec (2011), and Zhu et al. (2011).

First of all, Anokhin and Schulze (2009) established the negative influence of corruption on innovation in emerging markets. Secondly, Chadee and Roxas (2013) demonstrated the strong, direct and negative effects of three institutional environment-variables (regulatory quality, rule of law, and corruption) on innovation capacity and business performance in Russia. Zhu et al. (2011) looked at another former communist country (China) and identified five key institution-based barriers to innovation for small- and medium-sized firms (hereafter: SMEs): (1) competition fairness; (2) access to financing; (3) law and

regulations; (4) tax burden; and (5) support systems. Lastly, Srholec (2011) conducted a multilevel analysis of innovation in developing countries and looked at a number of barriers: the tax system, the organization of the political system, macroeconomic stability, and the extent of basic education.

These studies are either based in one country or only focused on a limited number of institutional voids, calling for a more extensive study on the impact of a broader range of institutional voids on innovation in emerging markets. Moreover, there is no study available that employs a systematic approach by categorizing institutional voids in macro voids, product market voids, labour market voids, and capital market voids (Khanna & Palepu, 2010).

1.4 The enabling role of resources

According to Khanna et al. (2005), "successful companies work around institutional voids" (p. 64). Put differently, successful companies can mitigate the negative effects of institutional voids. Khanna and Palepu (2010) provide strategic choices for responding to institutional voids. Here, the choice 'Accept or attempt to change market context' is applicable. This means that firms would either accept the market context and the institutional voids residing in it. In that case, the firm would possess the resources to adapt itself to the existing voids. The other option is to change the market context, where a firm would engage in institutional change. In line with this, Doh et al. (2017) argue that institutional voids can offer a competitive advantage to firms that have the skills and resources to address them. This is an application of the resource-based view (hereafter: RBV), which establishes that firm heterogeneity is important (Barney, 1991; Wernerfelt, 1984), and that firm-level resources and capabilities are critical for innovation (Crespi & Zuñiga, 2012).

From an RBV-perspective, there is not much research on innovation in emerging markets. Robson et al. (2008) found that in Ghana, innovation was related to the education level of the entrepreneur and that firm size and exporting had a positive relationship with innovation. Secondly, Hadjimanolis (2000b) discovered that differences in innovativeness of small firms in Cyprus are explained by managerial skills and capabilities, internal technological resources and capabilities. Mahemba and De Bruijn (2003) also looked at small firms and conducted research on SMEs in Tanzania. They conclude that an increased level of applied change is associated with innovation in SMEs. They also found a positive relationship between innovativeness and growth performance. Another study on SME innovativeness was

carried out by Radas and Božiç (2009) in Croatia. Su, Tsang and Peng (2009) conducted a survey among Taiwanese biotechnology firms. The responses indicate that Research & Development (hereafter: R&D), marketing, and manufacturing capabilities have different effects on product and process innovations. In contrast, Crespi and Zuñiga (2012) investigated innovation in six Latin American countries (Argentina, Chile, Colombia, Costa Rica, Panama, and Uruguay). They found that investing in knowledge leads to technological innovation and that innovation increased labour productivity. This last result was also discovered by Chudnovsky et al. (2006) in their study on Argentine manufacturing firms.

These are all small-scale studies. They were conducted in one country or in a small number of countries and mostly considered small firms. This calls for more extensive research, in terms of the number of countries and encompassing both large and small firms, that employs an RBV-perspective on innovation in emerging markets.

1.5 Research objective and research question

From the above, it can be concluded that both institutional voids and firm-level resources are important antecedents of innovation, with institutional voids being a serious constraint on innovative behaviour. Next to that, the possibility is named that firms achieve competitive advantage by using their resources to deal with institutional voids. There is only one study available where the effect of firm-level resources and institutional factors on innovation is examined (Barasa et al., 2017). This study is quite specific and only looks at regional institutional quality in East Africa. Consequently, the impact of institutional voids and enterprise resources on innovation in emerging markets has not been studied on a firm level. Thus, this will be the objective of this study.

This research objective will be fulfilled by using insights from institutional theory and from the RBV. First, institutional theory will be used as a lens to look at institutional voids. An institutional perspective has the advantage that "it specifies the particular combination of features that prevents efficient exchange in each market" (Khanna & Palepu, 2010, p. 27). Moreover, Peng has argued that research in emerging markets should use an 'institution-based view' (Peng, 2001; Peng, Wang & Jiang, 2008). Secondly, the resource-based view makes it possible to look at resources, competencies, and skills that firms in emerging markets develop to become innovative (Barney, 1991; Wernerfelt, 1984) and how they use their resources to deal with institutional voids. Lastly, since the degree of internationalisation enables firms to

develop competencies and skills, it is included as well. Considering the research objective, the following research question is answered:

Can firm-level resources and the degree of internationalisation mitigate the constraints imposed by institutional voids on innovation in emerging markets?

An answer to this research question is given by using firm-level data from the World Bank Enterprise Surveys (hereafter: WBES). Data from 27,831 firms from 48 countries in Eastern Europe, Africa, and Asia is used. A systematic approach to institutional voids is employed by using Khanna and Palepu's (2010) distinction between macro voids, product market voids, labour market voids, and capital market voids.

1.6 Theoretical and managerial relevance

By answering the research question, this master thesis contributes to the literature in a number of ways. First, it contributes to our understanding of innovation in emerging markets. There is still a lack of research on what moves or prevents firms in emerging markets from innovative behaviour (Goedhuys & Veugelers, 2012). Since innovation in emerging markets has the potential to guide economic development in these markets, it is an essential field of investigation. This master thesis enriches innovation research by looking at it from two views. Firstly, it considers how the institutional context plays a role in emerging markets, and secondly, an RBV-lens is employed to see which resources can mitigate the negative effects of institutional voids.

In particular, this master thesis investigates how resources and degree of internationalisation affect the negative relationship between institutional voids and innovation in emerging markets. In that sense, this study deepens our understanding of how institutional voids on a country level interact with resources on a firm level to explain innovation in emerging markets. Lastly, this study increases managers' understanding of how institutional voids influence firm innovation, which resources and which degree of internationalisation they can employ to mitigate those effects.

This study also adds to the literature about the impact of institutional voids on innovation in emerging markets. In particular, more clarity will be given to the question "which institutions matter?" (Rodrik, 2000, p. 2). Lastly, as said above, a systematic approach to institutional voids will be employed. Since this approach is not used before, this study

could be an advocate of a more systematic approach to research on institutional voids and encourage others to use this as well.

1.7 Thesis structure

The remainder of this master thesis will be structured as follows. In chapter 2, a review of the relevant literature is given, on the basis of which hypotheses are drawn and a conceptual framework is developed. Chapter 3 elaborates on the methodology used to test the conceptual framework from chapter 2. The results are presented in chapter 4, which are then discussed in chapter 5, that gives an interpretation of the results and their contribution to existing knowledge. On the basis of this, theoretical and managerial implications are given, the limitations of the conducted research will be discussed and directions for future research are given in chapter 6.

2. Theoretical Framework

First, innovation in emerging markets is discussed, and a definition of innovation is given (2.1). Secondly, institutional voids and their impact on innovation are elaborated upon by applying insights residing in institutional theory (2.2). Thirdly, the resource-based view is discussed and the link between firm-level resources and innovation is explained (2.3). Then, the three subjects (innovation, institutional voids, and resources) are discussed and the mitigating effect of firm-level resources and the degree of internationalisation is elaborated upon (2.4). Through chapter 2, hypotheses are drawn. On the basis of these, a conceptual framework is established (2.5).

2.1 Innovation in emerging markets

As already stated before, innovation in emerging markets is different from innovation in developed markets (Bogliacino et al., 2009; Bradley et al., 2012; Goedhuys & Veugelers, 2012; Khanna et al., 2005). This is largely due to the fact that "firms in emerging markets are far from the technology frontier." (Ayyagari et al., 2012, p. 1548). Innovation does not necessarily involve some technological breakthrough (Govindarajan & Ramamurti, 2011). On the contrary, in emerging markets, incremental innovations prevail (Abedoye, 1997; Crespi & Zuñiga, 2012; Robson et al., 2008) and innovations typically consist of imitation and technology transfer (Crespi & Zuñiga, 2012). Next to original inventions, production methods, products and organizational forms from developed countries are adopted (Ayyagari et al., 2012). Although the latter is not new in absolute terms, it is new to the firm and the context in which that firm operates, making it an innovation (Aubert, 2010; Fagerberg et al., 2010). In emerging markets, this so-called new-to-firm innovation is of greater significance than globally new technologies and is even more important for economic growth (Ayyagari et al., 2012). Consequently, a broad definition of innovation is employed (see Ayyagari et al., 2012 and Fagerberg et al., 2010): "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations." (Organisation for Economic Co-operation and Development, 2005, p. 46). A new product, process, marketing method or organisational method is considered to be an innovation if it is new (or significantly improved) to the firm (Ibid).

As emerging markets try to catch up with developed markets, technological change is facilitated by acquiring new machinery and equipment, purchasing technology, and imitating products and processes that were realized in developed countries (Bogliacino et al., 2009; Crespi & Zuñiga, 2012). In the globalizing world of today, innovations from emerging markets may draw on talent, technology, and ideas from all over the world (Govindarajan & Ramamurti, 2011). In emerging markets, even small innovations can bring about radical changes. Aubert (2010) gives some examples of innovations that have had a tremendous influence: "the use of mosquito nets to fight malaria or inventive uses of information technologies, including mobile phones for trade services, health care, and business management" (p. 7). Local firms need to adapt technology from developed countries to the emerging market context (Goedhuys & Veugelers, 2012). Mostly, innovations involve production at dramatically lower costs or the addition of features that are specifically valuable in the local context (Govindarajan & Ramamurti, 2011). In the process of adapting the technology to differences in inputs, tastes, customs, and cultures, new knowledge might be created, eventually leading to new innovations (Fagerberg et al., 2010). An innovation can also entail "novel and innovative combinations of existing knowledge and technologies to solve pressing local problems" (Govindarajan & Ramamurti, 2011, p. 193).

Irrespective of the kind of innovation, innovation remains a difficult undertaking (Hadjimanolis, 2000a), and is "inherently unpredictable and risky" (Zhu et al., 2011, p. 1140). This is no surprise if one concerns that innovation is affected by factors operating at distinct levels (Srholec, 2011). First of all, innovation depends on sources external to the firm, in particular on opportunities that are present in a firm's external, institutional, environment (Goedhuys, 2007; Mahemba & De Bruijn, 2003). Secondly, firm-level resources and the degree of internationalisation are linked to innovation (Crespi & Zuñiga, 2012; Mahemba & De Bruijn, 2003; Robson et al., 2008). These factors are discussed in the following sections.

2.2 Institutional theory: institutional voids

Insights from institutional theory are very relevant in emerging markets because institutions tend to play a central role in innovation adoption, diffusion, and performance (Ahn & York, 2009). Here, the concept of institutional voids is elaborated upon from an institutional perspective. This is done for a number of reasons. First, Peng argued that research in emerging markets should use an 'institution-based view' (Peng, 2001; Peng et al., 2008). Secondly, Khanna and Palepu, who introduced this concept to the literature (Khanna &

Palepu, 1997) used an institutional perspective as well and highlight its advantages in the book they published in 2010. The main advantage is that a systematic approach to institutional voids can be employed. Also, the institutional approach "specifies the particular combination of features that prevents efficient exchange in each market" (Khanna & Palepu, 2010, p. 27). Lastly, an institutional void perspective can shed light on key issues in the IB literature, "such as the effects of institutions on innovation" (Doh et al., 2017, p. 294).

2.2.1 Institutional theory

The institutional environment forms the context in which firms operate and provides opportunities and constraints that influence innovation (Barasa et al., 2017; Govindarajan & Ramamurti, 2011). The institutional environment consists of a social framework of norms, values and taken-for-granted assumptions. This framework defines appropriate or acceptable economic behaviour (Oliver, 1997). Within this institutional environment, different institutions are present. Institutions are either created or evolve over time. First, it is important to establish what these institutions precisely are. Institutions are "the rules of the game" (North, 1990, p. 3). North (1991) defines them as "the humanly devised constraints that structure political, economic and social interaction" (p. 97). Institutions provide the framework within which humans behave, by both forming constraints on human behaviour and by offering conditions under which individuals can undertake certain activities (North, 1990). They are useful tools for humans because they help them form expectations of the behaviour of others (Rodrik, 2000). By providing a stable structure, institutions reduce uncertainty (North, 1990). Concluding, institutions matter (Coase, 1998).

Institutions affect the costs of exchange and production. More concisely, they determine transaction and production costs. Transaction costs are the sources of social, political and economic institutions (North, 1990). They offer a measure of how well a market works (Khanna & Palepu, 2010) and determine the profitability and feasibility of transacting in a particular market (North, 1991). More specifically, by including a risk premium, transaction costs reflect the uncertainty that is present in a market. This uncertainty points to the likelihood of defection by the other party and the costs of this defection to the first party. Transaction costs consist of measurement and enforcement costs (North, 1990).

Measurement costs are formed by protecting rights and policing and enforcing agreements. They arise because parties need information. More precisely, parties need to measure the value of an exchange. This value resides in the different attributes that exist in a

good or service. Measuring these attributes takes resources. Since it is impossible for both parties to measure all the attributes, information asymmetries exist (North, 1990). Akerlof (1970) investigated the concept of information asymmetry in his famous article on the market for "lemons". He takes the example of a used car market. The seller of the used car has more knowledge about the quality than the buyer, leading to information asymmetry. Because of this asymmetry, buyers cannot distinguish the good cars from the bad cars. Thus, the price for good and bad cars will be the same (Akerlof, 1970). Information asymmetries can give rise to conflicts between buyers and sellers. If these conflicts are not resolved, the market will not function adequately. One way to resolve the conflict is by devising institutional arrangements. Taking the example of the used car market, an independent mechanic could give an expert evaluation on the quality of the car (Khanna & Palepu, 2010).

Next to measurement costs, enforcement costs can arise from second-party retaliation, internally enforced codes of conduct or societal sanctions, or a coercive third party like the state. Enforcement can become a problem in the case that one party is uncertain that the other party will live up to the agreement. In the case of this uncertainty, parties have to monitor the adverse party. As said, institutions reduce uncertainty and in this case specialized intermediaries can carry out this monitoring task (North, 1990). In developed markets, a range of these intermediaries is present, providing information and enforcement tasks. As a consequence, these markets are characterised by a higher degree of transparency and have relatively low transaction costs. However, in emerging markets, these intermediaries are lacking or absent (Khanna & Palepu, 2010). In these markets, the rules are largely emergent, due to ambiguity and uncertainty regarding the rules of exchange (Hitt, Dacin, Levitas, Arregle & Borza, 2000).

2.2.2 Institutional voids

Thus, in emerging markets, institutions are weak (Mair et al., 2012). This phenomenon is usually called institutional voids, which point to "the absence of specialized intermediaries, regulatory systems, and contract-enforcing mechanisms" (Khanna et al., 2005, p. 63). The institutional void concept can enlighten the relationship between institutions and firm behaviour because it guides the debate on which characteristics of institutions matter most to how firms operate (Doh et al., 2017). Next to that, "an institutional voids perspective facilitates the consideration of a wider range of institutions that incorporate both market and non-market effects on firms" (Ibid, p. 4). A broad range of institutional voids has been

considered in the literature. Institutional voids have been investigated in the context of Bovine Tuberculosis (Enticott & Franklin, 2009), in the context of policy making (Hajer, 2003), family businesses (Carney & Gedajlovic, 2003; Luo & Chung, 2012; Miller, Lee, Chang & Le Breton-Miller, 2009), and business groups (Chang & Hong, 2000; Fisman & Khanna, 2004; Khanna & Palepu, 2000, 2010). Institutional voids have also been investigated in the context of entrepreneurship and innovation in emerging markets (Anokhin & Schulze, 2009; Chadee & Roxas, 2013; Goedhuys, 2007; Mair & Marti, 2009; Puffer & McCarthy, 2011; Schmieding, 1991; Srholec, 2011; Zhu et al., 2011).

From this literature, a great number of institutional voids can be derived. For example, a lack of independent consumer information organizations and government watchdog agencies (Khanna & Palepu, 1997; Luo & Tung, 2007), an ineffective and non-transparent legal and judicial system (Chadee & Roxas; Inoue, Lazzarini & Musacchio, 2013; Luo & Tung, 2007), with few extra-judicial arbitration mechanism (Khanna & Palepu, 1997) and slow and capricious law and contract enforcement (Chadee & Roxas, 2013; Khanna & Palepu, 1997; Luo & Tung, 2007), a lack of strong educational institutions (Aidis, 2005; Khanna & Palepu, 1997), and a shortage of skilled labour (Aidis, 2005; Hoskisson, Eden, Lau & Wright, 2000; Inoue et al., 2013).

However, what is lacking in the literature is a study that employs a more systematic approach to the institutional voids concept. This approach can be found in the work of Khanna and Palepu (2010). They distinguish between three types of market voids: product market voids, labour market voids and capital market voids. That voids are present in the product market and the capital market, does not necessarily mean that voids are present in the labour market as well, and vice versa. (Khanna & Palepu, 2010). The main sources of failure in these three markets are “absent or unreliable sources of market information, an uncertain regulatory environment, and inefficient judicial systems” (Khanna & Palepu, 2010, p. 16). Moreover, the macro context is important because this context shapes factor and output markets. Politics, history, and culture are central to the development of institutions and thus to the existence of institutional voids. The rule of law, regulatory institutions, and the openness of the economy all influence the institutional context (Khanna & Palepu, 2010). Thus, next to the three market voids, a fourth void exists: the macro void. The application of these four voids incorporates both market and non-market effects on firms. Now, the voids will be discussed separately. Through this discussion, it will become clear that the institutional voids

named before can be classified as either a product market void, a labour market void, a capital market void or a macro void.

Unfortunately, the data from the Enterprise Surveys does not include sufficient measures on labour market voids and capital market voids. Thus, due to data restrictions, only product market voids and macro voids are investigated in this thesis. The first of those two, product market voids, points to the absence of information. Companies cannot easily access data on consumer tastes, and consumers cannot access unbiased information on the quality of goods and services. Other antecedents of product market voids are the existence and quality of: suppliers, infrastructure, retail chains, distributors, after-sales service, and product-related regulations. Then, the second type of voids investigated here is macro voids. This encompasses the political climate, the role of the legislative, executive and judiciary, regulations, property rights, bureaucracy, the media, the investment climate, corruption, and crime. For example: is the judiciary independent? And do elections take place regularly? (Khanna & Palepu, 2010).

Now that it is clear what institutional voids are, the implications of their existence can be elaborated upon. Where institutional voids are present, buyers and sellers have more difficulty with interacting because mechanisms that bring them together are absent (Khanna & Palepu, 2010). As a result of reduced information flows, underdeveloped factor markets and limited market intermediaries, institutional voids increase transaction costs (Doh et al., 2017). Firms rely on intermediaries to understand customer preferences, to raise the willingness to pay of consumers, and to lower their own costs (Khanna & Palepu, 2010). Put more generally, institutional voids can negatively impact firm performance, the functioning of markets, and economic growth (Doh et al., 2017; Khanna & Palepu, 1997; Mair et al., 2012; Peng et al., 2008). The next section elaborates on what this means for innovation.

2.2.3 Institutional voids and innovation

Regarding innovation, the formal institutional context in which a firm operates is said to be of great importance (Chadee & Roxas, 2013; Goedhuys, 2007). Specifically, institutional voids have a negative impact on innovation (Anokhin & Schulze, 2009). Furthermore, institutional voids lead to higher transaction costs, which in turn increase the costs of innovation (Zhu et al., 2011), including the costs of "enforcement of contracts, security and safety, tax burden, financing and compliance with bureaucratic rigidities in the government" (Chadee & Roxas, 2013, p. 5). According to Anokhin and Schulze (2009), corruption and the

quality of institutions play an important role in determining if innovation activities will arise and if so, if the innovation will be successful.

Barasa et al. (2017) and Chadee and Roxas (2013) considered the influence of corruption on innovation as well. The first study was conducted in East Africa and the second in Russia. Both studies also looked at regulatory quality and the rule of law and concluded that these measures of institutional quality have negative effects on innovation. In more detail, institutions are important for innovation because they offer the window of opportunity within which innovation can take place. Institutions mitigate uncertainty and risk by providing regulations that govern economic behaviour, by enforcing contracts, and by mediating intellectual property rights and patent laws (Barasa et al., 2017; Chadee & Roxas, 2013). Moreover, government support, proactive economic and industrial policies and other government programs can enable firms to pursue innovative behaviour (Chadee & Roxas, 2013). More specifically, Chadee and Roxas (2013) found that innovation and performance are influenced positively by a well-functioning legal and judicial system, effective contract enforcement, public safety and security, protection of property rights, and an efficient regulatory framework and fewer bureaucratic rigidities. Consequently, the absence of those prohibits innovation. Especially, an efficient regulatory framework and fewer bureaucratic rigidities minimize transaction costs and enable firms to focus on their innovation activities (Chadee & Roxas, 2013).

In a multilevel analysis of innovation in developing countries, Srholec (2011) found that the tax system, the organization of the political system, macroeconomic stability, and the extent of basic education are relevant for innovation. Lastly, Zhu et al. (2011) investigated barriers to innovation in SMEs in China and found that there were five key institution-based barriers: (1) competition fairness; (2) access to financing; (3) law and regulations; (4) tax burden; and (5) support systems. SMEs in the IT sector perceive the tax system in China as a barrier to innovation, since it does not allow them to deduct production costs from sales income. That the second barrier, lack of finance, constraints innovation was also established by Ayyagari et al. (2012) and Goedhuys and Veugelers (2012).

Thus, from the discussion above, it is clear that institutional voids have a negative impact on innovation. However, the relationship between the four types of voids and innovation in emerging markets has not been investigated explicitly in the literature yet. Consequently, it is difficult to find evidence that each type has a negative effect on innovation. Moreover, some voids that are investigated can, on the one hand, be categorised

as more than one type of void, for example, the quality of institutions, or, on the other hand, are what Khanna and Palepu see as sources of institutional voids, like inefficient judicial systems. However, both parts of product market voids (for example the protection of property rights, see Chadee and Roxas, 2013), labour market voids (for example the extent of basic education, see Srholec, 2011), capital markets voids (for example the lack of finance, see Ayyagari et al., 2012, and Zhu et al., 2011), and macro voids (for example corruption, see Anokhin and Schulze, 2009, Barasa et al., 2017, and Chadee and Roxas, 2013) can be found in the literature. It could be hypothesised that there is a negative relationship between each of these voids and innovation in emerging markets. Since the data from the Enterprise Surveys does not include sufficient measures on labour market voids and capital market voids, only two hypotheses are drawn:

- **Hypothesis 1a: Macro voids have a negative impact on firm innovation in emerging markets, such that the greater the macro voids, the lower will be firm innovation in emerging markets.**
- **Hypothesis 1b: Product market voids have a negative impact on firm innovation in emerging markets, such that the greater the product market voids, the lower will be firm innovation in emerging markets.**

Next to institutional factors, firm-level resources are also linked to innovation in emerging markets. More specifically, it is proposed that resources mitigate the risks imposed by voids. Thus, those are elaborated upon in the next section.

2.3 Resource-based view: firm-level resources

2.3.1 The resource-based view

Research has shown that the institutional environment is not the only factor that determines innovation (Barasa et al., 2017; Srholec, 2011). Firm heterogeneity is important as well (Barney, 1991; Wernerfelt, 1984). In particular, firm-level resources and capabilities are critical for innovation (Crespi & Zuñiga, 2012). The resource-based view is the designated perspective to look at firm-level resources. Just as institutional theory, the resource-based view is an influential perspective in the IB literature (Yamakawa, Peng & Deeds, 2008). In contrast to institutional theory, the RBV looks at internal aspects of the firm (Barney, 1991; Wernerfelt, 1984). Consequently, this theory is very well-suited to identify internal strengths and weaknesses of firms (Yamakawa et al., 2008). The RBV proposes firm heterogeneity and

focuses on firm-level resources and capabilities and how those can be a source of competitive advantage for firms (Barney, 1991; Wernerfelt, 1984).

2.3.2 Firm-level resources

Resources are "those (tangible and intangible) assets which are tied semipermanently to the firm" (Wernerfelt, 1984, p. 172). Resources can be physical, organizational, human, technological or reputational (Barney 1991; Hadjimanolis, 2000b) and include, in-house technology and employment of skilled personnel (Hadjimanolis, 2000b), a firm's management skills (Barney, 2001), and "all assets, capabilities, organizational processes, firm attributes, information, knowledge etc. controlled by a firm" (Barney, 1991, p. 101). A firm, then, is a bundle of tangible and intangible heterogeneous resources, whose combination can enable a firm to achieve sustainable competitive advantage (Wernerfelt, 1984). In order to be able to achieve sustainable competitive advantage, a firm's resources must be valuable, rare, inimitable and non-substitutable (Barney, 1991). Only if these criteria are met, a firm can distinguish itself from the competition (Barney, 1991). Other important principles of the RBV are the learning aspect (Hadjimanolis, 2000b), and intangibility (Oliver, 1997).

Within the RBV, Teece, Pisano, and Shuen (1997) have advocated a dynamic capabilities approach that should especially be relevant in "a Schumpeterian world of innovation-based competition" (p. 509). The term capabilities is also mentioned frequently in the RBV literature. Makadok (2001) defines capabilities as "a special type of resource – specifically, an organizationally embedded, non-transferable firm-specific resource whose purpose is to improve the productivity of the other resources possessed by the firm" (p. 389). These capabilities cannot simply be bought, instead, they must be built. (Ahn & York, 2009).

As already established in the introduction, emerging economies have been growing. However, many firms in emerging markets are young or recently privatized and do not have strong resource endowments (Hitt et al., 2000). As a consequence of the limited exposure of firms in emerging markets to global competition, technological and managerial standards are low, resulting in inadequate resources and capabilities (Madhok & Keyhani, 2012). According to Hoskisson et al., (2000), "resources for competitive advantage in emerging economies are, on the whole, intangible" (p. 256). What does this mean for innovation in emerging markets?

2.3.3 Resources and innovation

Research has confirmed that firm resources are important drivers of innovation in emerging markets and that limited resources constrain the level of innovation (Abedoye, 1997; Barasa et al., 2017; Hadjimanolis, 2000b; Mahemba & De Bruijn, 2003). Although the effect of resources on innovation is not always supported in the literature (Robson et al., 2008; Ronde & Hussler, 2005), it is generally acknowledged that resources are important drivers for innovation. Since innovation is a key route to competitive advantage, it is important to investigate resources and organizational capabilities that are linked to innovation (Hadjimanolis, 2000a). A great number of resources and capabilities has been associated with innovation in emerging markets: R&D (Barasa et al., 2017; Chudnovsky et al., 2006; Fagerberg et al., 2010; Ritter et al., 2016), technological assets (Fagerberg et al., 2010; Hadjimanolis, 2000b), human capital (Ayyagari et al., 2012; Barasa et al., 2017; Radas & Božiç, 2009; Ritter et al., 2016), managerial experience (Ayyagari et al., 2012; Barasa et al., 2017; Custódio, Ferreira & Matos, 2014; Mahemba & De Bruijn, 2003), firm age (Ayyagari et al., 2012; Radas & Bozic, 2009), and firm size (Ayyagari et al., 2012; Bogliacino et al., 2009; Chudnovsky et al., 2006; Robson et al., 2008). Considering that the influence of resources on innovation is established in the literature, no hypotheses will be drawn. A much more interesting question is if resources can mitigate the negative effects of institutional voids on innovation. The next section elaborates upon this mitigating effect.

2.4 Innovation, institutional voids, and firm-level resources

2.4.1 Institutional voids and firm-level resources

Although Barney (2001) stressed that the value of firm resources should be presumed within the broader context in which the firm is embedded, the RBV has been criticised that it is too one-sided because it only looks at internal firm attributes and does not take environmental factors into account (Sirmon, Hitt & Ireland, 2007). Scholars have called for more focus on the social context within which firms operate (Oliver, 1997). Institutional theory, on the other hand, looks predominantly at this social context. This leads to the conclusion that internal firm resources and the external institutional environment should not be considered separately. More importantly, they cannot be considered separately, because institutions determine which resources a firm possesses and which resources it can develop (Ahn & York, 2009) and differences in the nature of institutions affect resource decisions

(Hitt et al., 2000). As already discussed, institutional voids can offer a competitive advantage to firms that have the skills and resources to address them (Doh et al., 2017).

From sections 2.2.3 and 2.3.3 it has become clear that both firm-level resources and the institutional context in which a firm operates are essential to understanding innovation. There is one study that explicitly considers institutions, resources and innovation in emerging markets (Barasa et al., 2017). More precisely, Barasa et al. (2017) look at regional institutional quality in East Africa and how this quality enhances the transformation of firm-level resources into innovation. Their study differs from this one because this study considers a wider range of countries. Moreover, this study investigates institutional voids, while Barasa et al. (2017) refer to Scott's institutional pillars in emerging markets to conceptualise institutional quality. Furthermore, this study considers institutional voids and resources on a firm level, not on a regional level. The last difference is that this study considers the mitigating effect of firm-level resources on innovation. Consequently, resources will be seen as a moderator.

2.4.2 The mitigating effect of resources

As elaborated upon in section 1.4, firms can either accept the market context and adapt itself to the institutional voids residing in it, or a firm can try to change the market context. In order to adapt itself to the institutional context, a firm requires certain resources. From the resources that have been associated with innovation in emerging markets, human capital and managerial experience are expected to allow a firm to adapt itself to the institutional context.

2.4.2.1 Human capital

The first resource that is expected to mitigate the negative relationship between institutional voids and innovation in emerging markets is broadly defined as 'human capital', encompassing formal education and on-the-job training (in line with Barasa et al., 2017). Human capital is an intangible resource that is related to the learning aspect in the RBV. A number of variables related to human capital are positively associated with innovation (Chudnovsky et al., 2006). First, a high education level of workers is said to influence innovation (Ayyagari et al., 2012; Goedhuys & Veugelers, 2012; Ritter et al., 2016), especially if qualified scientists and engineers are present (Radas & Božiç, 2009). Secondly, training of workers is important for innovation activities, because it strengthens the quality of human resources by expanding employees' technical capabilities, knowledge, and skills. Consequently, trained employees are better able to develop, adopt and implement new

technologies (Robson et al., 2008). In particular, human capital in the form of highly skilled and highly educated employees enhances a firm's absorptive capacity. Absorptive capacity is "a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability" (Zahra & George, 2002, p. 186). Absorptive capacity is a critical source of innovation (Barasa et al., 2017). Concluding, by enhancing a firms' absorptive capacity, training and education have a positive influence on innovation.

First of all, the acquisition, assimilation, transformation, and exploitation of knowledge that is enabled by absorptive capacity, can produce the dynamic organizational capability of finding and selecting innovation opportunities. Thus, absorptive capacity can provide windows of opportunity for innovation. In that way, it can substitute a function that is normally provided by institutions (see section 2.2.3). This knowledge acquisition has another implication. In particular, knowledge about uncertainties and risk can be assembled. From section 2.2.3, it is clear that institutional voids negatively influence innovation because they provide uncertainty and risk (Barasa et al., 2017; Chadee & Roxas, 2013). This function could again be substituted by absorptive capacity. Lastly, it can be argued that absorptive capacity decreases transaction costs. As became clear in section 2.2.1, institutional arrangements can resolve the conflict that arises as a consequence of information asymmetry between buyers and sellers (Akerlof, 1970). However, where institutional voids are present, those institutional arrangements are lacking or functioning inadequately (Khanna & Palepu, 2010). Absorptive capacity can enable firms to acquire knowledge about their transaction partners, leading to a decrease in information asymmetry. Thus, hypothesis 2a considers the moderating effect of human capital:

- **Hypothesis 2a: The negative impact of institutional voids on innovation is weakened by human capital's presence, such that the greater human capital, the lower will be the negative impact of institutional voids on firm innovation in emerging markets.**

2.4.2.2 Managerial experience

Whereas human capital is about the building of absorptive capacity, the second variable is more about decision making within the firm: managerial experience. Managerial experience is an important tacit skill that enables managers to execute the most promising innovation activities (Custódio et al., 2014). Thus, it is an important antecedent of innovation (Ayyagari et al., 2012; Barasa et al., 2017; Mahemba & De Bruijn, 2003). Managerial experience not

only entails on-the-job experience but also prior work experience within the same sector. Through the acquisition of skills and knowledge, experience expands the capabilities of the manager and his social networks (Nichter & Goldmark, 2009). Managers use their skills and experience when making decisions and identifying innovation opportunities (Barasa et al., 2017). An experienced manager knows the environment in which the firm operates, he/she better understands that environment and is better able to identify risks and opportunities residing in that environment (McGee & Dowling, 1994). Since innovation depends on the opportunities present in a firm's environment (Goedhuys, 2007; Mahemba & De Bruijn, 2003), knowledge of what is detrimental to innovation in that environment is essential.

Thus, managerial experience is critical to innovation. Since an experienced manager better understands the institutional environment, he/she will not only decipher the windows of opportunity that are provided by existing institutions, he/she will also know which institutional voids exist and how they form barriers to innovation. This is very valuable because the manager can now deal with the voids and think of ways to adapt the firm to the institutional environment. Besides a better understanding of the environment, managerial experience also expands a managers' social networks. Social capital enables the efficient transmission of information, knowledge, and ideas (Murphy, 2002). A manager can learn from his social network (Robson et al., 2008). Secondly, building relationships improves trust, which in turn improves the quality of information exchanges (Murphy, 2002). Building relationships with transaction partners can reduce information asymmetry as well (Akerlof, 1970), decreasing the transaction cost resulting from it. Concluding, an extensive social network enables a manager to reduce transaction costs. Consequently, hypothesis 2b considers the moderating effect of managerial experience:

- **Hypothesis 2b: The negative impact of institutional voids on innovation is weakened by managerial experience, such that the greater managerial experience, the lower will be the negative impact of institutional voids on firm innovation in emerging markets.**

2.4.3 The mitigating effect of degree of internationalisation

Next to the aforementioned resources, a firm's degree of internationalisation can also allow a firm to adapt itself to the institutional context. Degree of internationalisation is said to be related to innovation. Therefore, it is key (Robson et al., 2008). Exporters are more innovative than non-exporters (Ayyagari et al., 2012; Hadjimanolis, 2000b; Ritter et al.,

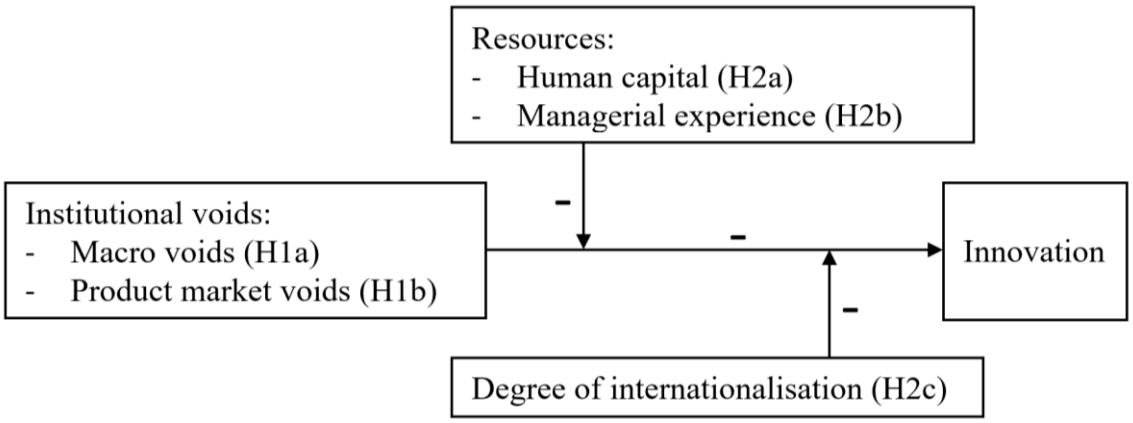
2016). Moreover, export activity has a positive impact on the probability of undertaking innovation activities (Chudnovsky et al., 2006; Radas & Božiç, 2009) and exposure to international competition spurs innovation (Bogliacino et al., 2009). Exporting can be used to facilitate organizational learning by gaining access to innovations in other countries (Yamakawa et al., 2008). The learning aspect of resources can be found here as well. Export involvement expands a firm's geographic network, bringing them in contact with ideas, products, and services from other countries. This may lead to the development of new products and services (Robson et al., 2008). Moreover, Beck, Demirgüç-Kunt, and Levine (2005) found that large exporting firms are the primary mechanism through which technologies are adapted to local circumstances in emerging markets.

It can be concluded that the degree of internationalisation positively influences innovation (Ayyagari et al., 2012; Hadjimanolis, 2000a; Ritter et al., 2016). The degree of internationalisation can also mitigate the negative relationship between institutional voids and innovation in emerging markets. Firms that export are active in other countries. The institutions in those countries will differ from the institutions in the home country. More specifically, the institutional voids that hinder innovation in the home environment might not be present in the host environment and transaction costs in those markets might be lower. Consequently, by exporting, firms can steer clear of institutional voids, thereby adapting themselves to the institutional context. Moreover, exporting can facilitate organizational learning. Firms from emerging markets attempt to exploit newly acquired knowledge in their home market (Hitt, Li & Worthington, 2005). This knowledge can be applied to the national context and can be used to mitigate uncertainty and risk. A function that would normally be fulfilled by institutions, but is not present in the case of institutional voids. Secondly, institutions offer windows of opportunity for innovation. In the case of institutional voids, these are lacking. Since exporting expands a firm's geographic network, it facilitates organizational learning (Yamakawa et al., 2008) and brings firms in contact with ideas, products, and services from other countries (Robson et al., 2008). In that way, exporting can substitute institutions by offering windows of opportunity for innovation. In line with this, the last hypothesis considers the moderating effect of the degree of internationalisation:

- **Hypothesis 2c: The negative impact of institutional voids on innovation is weakened by the degree of internationalisation, such that the greater the degree of internationalisation, the lower will be the negative impact of institutional voids on firm innovation in emerging markets.**

2.5 The conceptual framework

Combining hypotheses 1a, 1b, 2a, 2b and 2c and the research question, a conceptual framework is made:



3. Methodology

3.1 Data

To investigate the conceptual framework given above, data from the World Bank Environment Survey (WBES) is used. The WBES is a major cross-sectional firm level survey covering 139 countries. The surveys are implemented by the Enterprise Analysis United and conducted by private contractors on behalf of the World Bank. The mode of data collection is face-to-face interviews. Survey respondents include business owners and top managers, and sometimes also company accountants and human resource managers from firms in the manufacturing, retail, and other services sectors. The majority of the questions overlap, but separate questions for manufacturing and services exist as well (World Bank Group, 2017).

The World Bank has been conducting firm level surveys since the 1990's, but not until 2005 did they start centralizing the data collection efforts. Now, the Global Methodology is used and data is comparable across countries (World Bank Group, 2017). "The main purpose of the WBES is to identify obstacles to firm performance and growth around the world" (Ayyagari, Demirgüç-Kunt & Maksimovic, 2008, p. 488). Specifically, the questionnaires include many aspects of a firm's operations (Barth, Lin, Lin & Song, 2009). Topics include: firm characteristics, gender participation, access to finance, annual sales, costs of inputs/labour, workforce composition, bribery, licensing, infrastructure, trade, crime, competition, capacity utilization, land and permits, taxation, informality, business-government relations, innovation and technology, and performance measures (World Bank Group, 2017).

Enterprise Surveys (hereafter: ES) uses stratified random sampling. The strata are firm size, business sector, and geographic region within a country. Firstly, regarding firm size, the number of employees is taken as a proxy (small: 5-19, medium: 20-99, large: 100+). The surveys oversample large firms since the majority of firms are small or medium-sized. Secondly, the business sectors considered are manufacturing, retail, and other services. Lastly, for the geographic region, the ES looks at the cities and/or regions that collectively contain the majority of economic activity (World Bank Group, 2017).

In this study, data from 2013 is used. The data set Eastern Europe and Central Asia is supplemented with data from Africa and Asia. Although the global methodology is used, not all data were comparable. This led to the exclusion of Madagascar and Cambodia. Consequently, data from 29,949 firms in 48 countries are used, including Poland, Morocco, and Nepal. Of these, information for 27,831 firms was retained following data cleaning for

missing values. Data from individual countries ranges from 148 to 3,418 firms. The number of interviews conducted in a country depends on its size. Usually, the data of large economies consist of 1,200-1,800 interviews, in medium-sized economies 360 interviews take place, and for small economies, 150 interviews are conducted (World Bank Group, 2009). For a list of all countries in the dataset, see Appendix A. This sample includes mostly small (51.5 %), and medium firms (32.2 %), with a number of large firms (15.1 %) and almost no micro-sized firms (1.6 %). Looking at the industries in which firms are active, the majority is in manufacturing (48 %), a smaller number is active in other services (32.9 %), and the smallest part is in retail (18.8 %).

3.2 Measures

3.2.1 Dependent variable: innovation

In section 2.1 the dependent variable, innovation, was broadly defined as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations." (Organisation for Economic Co-operation and Development, 2005, p. 46). In the Oslo Manual, a multi-year approach is recommended because some firms may not perform innovation activities on a regular basis. Lastly, it is possible to collect data on all categories of innovation activities (Ibid).

This is exactly what is done in the ES. The WBES includes a number of questions on innovation, the first one being: "During the last three years, has this establishment introduced new or significantly improved products or services?" Then, the same question is asked for improved methods for production or supply of products or services[2], organizational or management practices or structures[3], marketing methods, and logistical or business support processes[4]. The answer 'yes' is given the value 1, the answer 'no' is given the value 0.[5] This

[2] In the supplementary data, this was formulated differently: methods of manufacturing products or offering services.
[3] In the supplementary data, this was formulated differently: organizational structures or management practices.
[4] In the supplementary data, two questions were used: (1) logistics, delivery, or distribution methods for inputs, products, or services, and (2) supporting activities for your processes, such as maintenance systems or operations for purchasing, accounting, or computing. These two questions could be interpreted as (1) logistical processes and (2) business support processes. Thus, the data is converged as follows: if one of the two questions was answered positively, a value of 1 was assigned. For all the other cases, a value of 0 was assigned.
[5] The dataset from the ES used the value 1 for yes and the value 2 for no. For interpretation purposes, value 2 is recoded into value 0. This is applicable for all closed questions in the survey.

is applicable for all closed questions in the survey. The ES also includes the following question: “Were any of the new or significantly improved products or services also new for the establishment’s main market?” Since only 6,008 respondents gave a positive answer to this question and since innovation in emerging markets is mostly about new-to-firm innovation (see section 2.1), this questionnaire item is excluded from the analysis. The other questionnaire items are used to measure innovation. Table 1 displays the operationalization of the OECD-definition.

Table 1. Operationalization of the dependent variable: innovation

Definition OECD	Questionnaire item ES	Similar measure used
Product (good or service)	During the last three years, has this establishment introduced new or significantly improved products or services?	Ayyagari et al. (2012) Barasa et al. (2017) Chadee & Roxas (2013) Crespi & Zuñiga (2012) Griffith, Huergo, Mairesse & Peters (2006) Østergaard, Timmermans & Kristinsson (2011) Radas & Božiç (2009) Ritter et al. (2016) Robson et al. (2008)
	During the last three years, has this establishment introduced new or significantly improved methods for production or supply of products or services?	Robson et al. (2008)
Process	During the last three years, has this establishment introduced new or significantly improved logistical or business support processes?	Griffith et al. (2006) Robson et al. (2008)
Marketing method	During the last three years, has this establishment introduced new or significantly improved marketing methods?	Crespi & Zuñiga (2012) Robson et al. (2008)
Organisational method in business practices, workplace organisation or external relations	During the last three years, has this establishment introduced new or significantly improved organizational or management practices or structures?	Crespi & Zuñiga (2012) Robson et al. (2008)

To examine if the 5 different questionnaire items reflect a single variable, a factor analysis is conducted. In this case, the dataset can be reduced to a more manageable size, while as much as possible of the original information can be retained (Field, 2013). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .831 (Field, 2013). Moreover, Bartlett's Test of Sphericity is significant ($p < .01$), which indicates that sufficient correlations exist among the variables to proceed (Hair, Black, Babin & Anderson, 2014). The chosen extraction method is principal axis factoring because the different items are not normally distributed (Costello & Osborne, 2005). One factor was extracted. The factor has an eigenvalue of 2.97 and explains 59.45 % of the variance. The communalities are all higher than .2 (Hair et al., 2014), and the factor loadings are sufficiently high (>.3) as well. The outcomes of the statistical tests can be found in Appendix C.

Then, a summated scale is composed, resulting in one metric dependent variable measuring innovation. A summated scale has the benefits that measurement error can be overcome to some extent, and that multiple aspects of a concept can be represented in a single measure (Hair et al., 2014). The more types of innovation a firm uses, the higher the score on the dependent variable. The most common measure of scale reliability is Cronbach's alpha. (Field, 2013). Ideally, it is higher than .8, and it should not be lower than .6 (Field, 2013). The scale for innovation is sufficiently high, Cronbach's $\alpha = .829$ (Appendix D).

3.2.2 Independent variables: institutional voids

The ES asks managers to rate the extent to which fifteen items present an obstacle to the operation of their business. Specifically, the question is "To what degree is [insert one of 15 obstacles] an obstacle to the current operations of this establishment?" The answers range from 0 to 4, denoting no obstacle (0), a minor obstacle (1), a moderate obstacle (2) a major obstacle (3) and a very severe obstacle (4). Using the obstacles as measures for the independent variables enables us to compare the different obstacles and the extent to which they form a constraint on firm innovation.

Based on the theory on *macro voids*, the following obstacles can be used as measures: customs and trade regulations, crime, theft and disorder, tax administration, business licensing and permits, political instability, corruption, courts, and labour regulations. The method of extraction is principal axis factoring due to the same considerations as for the dependent variable. The Kaiser-Meyer Olkin measure (KMO = .861) and Bartlett's Test of Sphericity were both sufficient (Appendix E). Again, one factor was extracted. The communalities and

factor loadings are all sufficiently high. The component has an eigenvalue of 3.37 and explains 42.11 % of the variance (Appendix E). Then, a summated scale is composed, resulting in a macro voids variable. The macro void scale is reliable, Cronbach's α = .802 (Appendix F). Table 2 provides the operationalization of this variable.

Table 2. Operationalization of the independent variable: macro voids

Definition **(Khanna & Palepu, 2010)**	**Questionnaire item ES** To what degree is [insert one of the obstacles below] an obstacle to the current operations of this establishment?	**Similar measure used**
"How effective are the quasi-judicial regulatory institutions that set and enforce rules for business activities?" (p. 48) "Has the country signed free-trade agreements with other nations? If so, do those agreements favour investments by companies from some parts of the world over others?" (p. 49)	Customs and trade regulations	Barasa et al. (2017)
"Do the laws articulate and protect private property rights? (…) Do religious, linguistic, regional, and ethnic groups coexist peacefully, or are there tensions between them? (…) Can strangers be trusted to honor a contract in the country?" (p. 48)	Crime, theft, and disorder	Barasa et al. (2017) Chadee & Roxas (2013)
"What would be the impact of tariffs on a company's capital goods and raw material imports? How would import duties affect that company's ability to manufacture its products locally versus exporting them from home?" (p. 49)	Tax administration	Barasa et al. (2017) Chadee & Roxas (2013)
"Does the government go beyond regulating business to interfering with it or running companies?" (p. 48) "How long does it take to start a new venture in the country? (…) Can a company set up its business anywhere in the country? If the government restricts the company's location choices, are its motives political, or is it inspired by a logical regional development strategy?" (p. 49)	Business licensing and permits	Barasa et al. (2017) Chadee & Roxas (2013)

Table 2. Operationalization of the independent variable: macro voids

Definition (Khanna & Palepu, 2010)	**Questionnaire item ES** To what degree is [insert one of the obstacles below] an obstacle to the current operations of this establishment?	**Similar measure used**
"To whom are the country's politicians accountable? Are there strong political groups that oppose the ruling party? Do elections take place regularly?" (p. 48)	Political instability	Barasa et al. (2017) Chadee & Roxas (2013)
"Do people tolerate corruption in business and government?" (p. 10)	Corruption	Barasa et al. (2017) Chadee & Roxas (2013)
"Is the judiciary independent? Do the courts adjudicate disputes and enforce contracts in a timely and impartial manner?" (p. 48)	Courts	Barasa et al. (2017) Chadee & Roxas (2013)
"How difficult is it to get work permits for managers and engineers?" (p. 50)	Labour regulations	

Secondly, also looking at the theory, for *product market voids*, four obstacles are available: electricity, telecommunications, transport, and access to land. Again, the principal axis factoring method is used. The Kaiser-Meyer-Olkin measure (KMO = .713) and Bartlett's Test of Sphericity are adequate (Appendix G). One factor is extracted, with an eigenvalue of 2.02 and explaining 50.43 % of the variance. The communality of access to land is .124 (Appendix G), which is too low. Consequently, this variable is deleted. Again, one factor is extracted. KMO = .664 and Bartlett's Test of Sphericity is still adequate. Now, communalities and factor loadings are sufficiently high. The factor explains 60.42 % of the variance and has an eigenvalue of 1.81 (Appendix G). Here, a summated scale is composed as well. The scale of the product market variable is rather low, Cronbach's $\alpha = .672$ (Appendix H), but still sufficient. Table 3 provides the operationalization of this variable.

Table 3. Operationalization of the independent variable: product market voids

Definition (Khanna & Palepu, 2010)	Questionnaire item ES	Similar measure used
Power shortages (Khanna & Palepu, 1997)	Electricity	
"Soft infrastructure includes (…) corporate communication." (p. 23)	Telecommunications	
"How strong are logistics and transportation infrastructures?" (p. 45)	Transport	

3.2.3 Moderator variables: resources and the degree of internationalisation

First, the measure for *human capital* looks at the existence of formal training programs for permanent, full-time employees. A value of 1 denotes yes and a value of 0 denotes no, making this a dichotomous variable. Then, the second moderator is *managerial experience*. This is measured by the following question: "How many years of experience working in this sector does the top manager have?"[6] This is a metric variable because the answer is in number of years. Thirdly, *the degree of internationalisation* is measured by the following question: "In fiscal year [insert last complete fiscal year], what percentage of this establishment's sales were: national sales; indirect exports (sold domestically to third party that exports products); direct exports." The percentage of direct exports is used as a value for this variable. Table 3 displays the operationalization of the moderator variables.

Table 4. Operationalization of the moderator variables

Variable	Questionnaire item ES	Similar measure used
Human capital	Over the last fiscal year, did this establishment have formal training programs for its permanent, full-time employees?	Barasa et al. (2017) Goedhuys (2007) Goedhuys & Veugelers (2012) Robson et al. (2008) Srholec (2011)
Managerial experience	How many years of experience working in this sector does the Top Manager have?	Ayyagari et al (2012) Barasa et al. (2017) Goedhuys & Veugelers (2012)
Degree of internationalisation	In the last fiscal year, what percentage of this establishment's sales were direct exports?	Barth et al. (2009) Crespi & Zuñiga (2012) Goedhuys & Veugelers (2012) Ritter et al. (2017) Robson et al. (2008)

[6] The value 9998 applied to managers that had less than 1 year of experience. For interpretation purposes, this value was recoded into 0 years.

3.2.4 Control variables

The first control variable is the *country* in which a firm resides. Since a country's history, geography or nature can influence the national innovation system (Fagerberg et al., 2009), in some countries more innovation is witnessed than in others. All countries have a code. Since this is a categorical variable, a dummy variable is made. Russia, the country where most respondents are from, is used as the reference category.

In line with previous research (Østergaard et al., 2011; Ritter et al., 2016), the second control variable is the *industry* in which the firm is active. Industries have codes as well. The different industries fit into three categories: manufacturing, retail, and other services. The industry variable is recoded into these three, where manufacturing receives the value 0, retail the value 1 and other services the value 2. Since this new variable is categorical, a dummy variable is made. Since most respondents are active in the manufacturing industry, this industry is used as the reference category.

Thirdly, since sector specific events may impact innovation (Barasa et al., 2017; Ritter et al., 2016; Srholec, 2011), the *sector* in which the firm operates is used as a control variable. For sector, the ISIC code is used[7]. Following the data cleaning for missing values, the sectors with codes 1429, 5210, 7493, and 7495 did not have values anymore. This variable is categorical as well, necessitating the creation of a dummy variable. Again, the reference category is the one in which most respondents are active, which is ISIC code 1810. A list of the different sectors can be found in Appendix B.

A fourth control variable is *R&D*, which is a necessary prerequisite for innovation. R&D spending is positively related to innovation (Chudnovsky et al., 2006; Fagerberg et al., 2010; Mahemba & De Bruijn, 2003; Ritter et al., 2016; Robson et al., 2008). According to Su et al. (2009), "a firm's R&D capability reflects its ability to generate new scientific discoveries and technological breakthroughs" (p. 312). R&D expenditures permit firms to extend their scientific and technological knowledge base, enabling them to develop new products and services (Barasa et al., 2017). To measure R&D, the following question is used: "During the last three years, did this establishment spend on research and development

[7] For a detailed structure and explanatory notes of the ISIC codes, I refer to the United Nations ISIC Rev.3.1 (United Nations Statistics Division (2017).

activities[8], either in-house or contracted with other companies (outsourced?)". This is a dichotomous variable, where a value of 1 means yes and a value of 0 means no.

The fifth control variable is *firm age*. A firm's age is said to be inversely related to innovation (Ayyagari et al., 2012). Thus, younger firms should be more innovative (Radas & Božiç, 2009). Following Barasa et al. (2017), the difference between the year of the survey and the year the firm was established is used to compute the firm age. This is measured in number of years; thus, it is a metric variable.

Seventhly, *firm size* is considered. Large firms are better able to innovate because they have a larger infrastructure, they possess economies of scale (Barasa et al., 2017), they have a greater capacity to manufacture and distribute products, and they have a wider range of knowledge, skills, and expertise (Robson et al., 2008). Innovation is capital intensive (Bogliacino et al., 2009; Fagerberg et al., 2010), and smaller firms do not possess sufficient financial means (Ritter et al., 2016). Concluding, large firms are more likely to innovate (Ayyagari et al., 2012; Bogliacino et al., 2009; Chudnovsky et al., 2006; Robson et al., 2008). Firm size is measured by four categories: micro (<5 employees), small (5-19 employees), medium (20-99 employees), and large (100+ employees). Since large firms are more likely to innovate, this variable is recoded into a dichotomous variable. Micro, small, and medium firms get a value of 0, and large firms get a value of 1.

The last control variable is *legal status*, comprising of six categories: shareholding company with shares traded in the stock market; shareholding company with non-traded shares or shares traded privately; sole proprietorship; partnership; limited partnership; other. Since Ayyagari et al. (2012) established that firms organized as corporations innovate more than unincorporated forms of business, this variable is also recoded into a dichotomous variable. A value of 0 is given if the firm is organized as a sole proprietorship, a (limited) partnership or other, and a value of 1 is given if the firm is a shareholding company. The operationalization of the control variables can be found in table 5.

[8] This is defined in the ES as: "creative work undertaken on a systematic basis in order to increase the stock of knowledge".

Table 5. Operationalization of the control variables

Variable	Questionnaire item ES	Similar measure used
Country (dummy)	Country code (Appendix A)	Barasa et al. (2017)
Industry (dummy)	Industry: - Manufacturing - Retail - Other services	Ritter et al. (2017)
Sector (dummy)	Sector code (Appendix B): ISIC Rev.3.1	Barasa et al. (2017)
R&D	During the last three years, did this establishment spend on research and development activities, either in-house or contracted with other companies (outsourced)?	Barasa et al (2017) Goedhuys (2007) Raffo, Lhuillery & Miotti (2008) Ritter et al. (2017) Srholec (2011)
Firm age	The year of the survey (2013) minus "In what year did this establishment begin operations?"	Aidis (2005) Ayyagari et al. (2012) Barasa et al. (2017) Hadjimanolis (2000b) Manikandan & Ramachandran (2015) Østergaard et al. (2011) Robson et al. (2008) Srholec (2011)
Firm size	Screener size: - Micro < 5 - Small >= 5 and <=19 - Medium >= 20 and <= 99 - Large >= 100	Ayyagari et al. (2012) Chadee & Roxas (2013) Barasa et al. (2017) Ritter et al. (2017)
Legal status	What is this firm's current legal status? Value 1: - Shareholding company with shares traded in the stock market - Shareholding company with non-traded shares or shares traded privately Value 0: - Sole proprietorship - Partnership - Limited partnership	Ayyagari et al. (2012) Barasa et al. (2017)

3.3 Intended data analysis procedure: multiple regression

Since there is one metrically scaled dependent variable, and there are two metrically scaled independent variables, the intended data analysis procedure is multiple regression (Hair et al., 2014). There are also a number of moderator variables and control variables. Some of these are metric, others are dichotomous, and some others are categorical. As explained above, for the categorical variables, dummies are created. In that way, those can be included in the regression analysis as well (Field, 2013). Multiple regression can both be used for prediction and for explanation (Hair et al., 2014). In this case, it is used to assess if institutional voids predict to which extent innovation activities are employed and if this effect is mitigated by resources and the degree of internationalisation.

Hypothesis testing was conducted using the following regression equation: Innovation = β_0 + β_1MacroVoids + β_2ProductMarketVoids + β_3MacroVoids*HumanCapital + β_4MacroVoids*ManagerialExperience + β_5MacroVoids*DegreeOfInternationalisation + β_6ProductMarketVoids*HumanCapital + β_7ProductMarketVoids*ManagerialExperience + β_8ProductMarketVoids*DegreeOfInternationalisation + β_9Country + β_{10}Industry + β_{11}Sector + β_{12}R&D + β_{13}FirmAge + β_{14}FirmSize + β_{15}LegalStatus + e.

3.4 Research ethics

Regarding the research ethics employed by the WBES, I refer to the website of the ES (World Bank Group, 2017). Secondly, the research ethics regarding the data analysis are considered. It is important to provide transparency in the way the data is processed and represented. Consequently, this is what I have done throughout this thesis. First of all, I recoded a lot of variables (see section 3.2). Next to the recoding that is elaborated upon in section 3.2, the values -9 (Don't know), -8 (Refused) and -7 (Does not apply) were recoded into system missing. I also transformed a number of variables (see section 4.2), but I made sure to always keep the original variables. Lastly, the data and the SPSS output of the analysis are provided when handing in this master thesis.

4. Results

4.1 Descriptive statistics

Before conducting the multiple regression analysis, the data have to be examined in more detail. A missing value analysis is already conducted (see section 3.1). Secondly, the relevant variables are checked for outliers (Hair et al., 2014). The boxplot for managerial experience shows that 19 outliers are present (Appendix I). These outliers represent answers that the top manager has 60 or more (61, 62, 63, 64, 65, 66, 70, and 100) years of experience working in the firm's sector. These values are indeed peculiar because they indicate that the manager would be 80 or even 120 years old and still working. Consequently, these values are recoded into system missing.

Then, to understand the data set better, descriptive statistics (Appendix J) can be used. The values for innovation range from 0 to 5, with a mean of 1.373. As already said, the value of 0 is overrepresented, which means that a lot of firms do not innovate at all. For macro voids, the value of 0 points at the absence of macro voids. The maximum is 32, and the mean is 8.81. Thus, on average, firms do not experience the existence a lot of macro voids. Since the measure for product market voids is made up of fewer obstacles than macro voids, its maximum is lower as well (12). Here, the value of 0 points at the absence of product market voids. The mean of 3.33 shows that the average firm does not sense the existence of a lot of product market voids. The dichotomous variable of human capital has two possible values, thus the mean of .32 shows that 68 % of firms do not provide training. Then, managerial experience has a range of 1 to 60 years and a mean of 17.73. For degree of internationalisation, the range goes from 0 to 100 %, where a value of 100 means that all of a firm's sales are direct exports. The mean is 7.64, with is rather low. This is explained by the fact that on the 90 % percentile, only 33 % of sales are direct exports. For most firms, the home market is the main market. Then, a short look at the control variables shows that only 14 % of firms spend on R&D, that firms are averagely 17 years old, and that a little more than half of the firms are incorporated (legal status).

Lastly, checking the correlations, all variables, except for managerial experience, correlate significantly with innovation. However, this does not mean that the interaction terms with managerial experience do not correlate with innovation.

4.2 Assumptions

Multiple regression has a number of assumptions. Before conducting the analysis, these assumptions have to be checked. To check the first two assumptions, the variables have to be assessed individually. For the other four assumptions, a simple linear regression analysis is conducted and the Durbin-Watson statistic and a scatterplot of standardized residual are requested (Appendix L).

First, the data distribution of the individual metric variables should correspond to the normal distribution. This can be checked by looking at a histogram that displays the normal curve, a normal probability plot (p-p plot), or at the skewness and kurtosis (Hair et al., 2014). Innovation, Macro voids, and Product market voids are right-skewed, mostly because the value of 0 is over presented. Besides this, the distribution is fairly normal and since the skewness is < | 3 |, this is no problem. Nonetheless, several transformations (square root, natural log, square, and cube) are conducted to see if this led to improvements, which was not the case. Managerial experience is also right-skewed and has a peaked distribution as well. Looking at the histogram and the p-p plot (Appendix K), this could be improved. A square root transformation is conducted, and now they are better. Degree of internationalisation has high skewness and high kurtosis. Several transformations are tried, with a natural log transformation[9] displaying the best improvement. Taking the natural log (ln) as opposed to the log-base-10 makes the coefficients directly interpretable as approximate proportional differences (Gelman & Hill, 2007). Skewness is now < | 3 |. Lastly, Firm age has high skewness and kurtosis as well. Again, several transformations are conducted, with the natural log transformation as the best outcome. The histogram and the p-plot have improved, and the skewness is now < | 3 |. The relevant SPSS output can be found in Appendix K.

Secondly, the variables have to be metrically scaled (Hair et al., 2014). This assumption is met for Innovation, Macro voids, Product market voids, Managerial experience, Degree of internationalisation, and Firm age. Human capital, R&D, Firm size and Legal status are categorical but binary, thus these also meet the assumption. Country, Industry, and Sector are categorical and are recoded into dummy variables.

Thirdly, the relationship between the dependent and the independent variables has to be linear (Hair et al., 2014). In SPSS, the scatterplot is opened with the chart editor and the loess

[9] Since it is impossible to take the natural log of 0, the transformation was computed as follows: ln(Degree of Internationalisation + 1). The same is applicable for the transformation of age.

line is fitted. This line is straight; thus, the assumption of linearity is met (see Appendix L). Moreover, the partial residual plots do not display any curves.

The fourth assumption is that of homoscedasticity: the variance of the error term should be constant (Hair et al., 2014). Looking at the scatterplot, for every predicted value the variance of the errors should be the same. That is the case since there are five lines that have the same thickness.

Fifthly, the error terms should be independent, meaning that the predicted value is not related to any other prediction (Hair et al, 2014). The Durbin-Watson statistic should be close to 2, or at least between 1 and 3 (Field, 2013). Here, Durbin-Watson is 1.63, which is sufficient.

The last assumption is normality of the error term distribution (Hair et al., 2014). In the scatterplot, there should be roughly the same number of dots above and below the 0 of the y-axis. Now, the mean of Y is fitted as a line on the scatterplot, showing that this assumption is met (see Appendix L).

4.3 The multiple regression analysis

Now that all the assumptions are met, a hierarchical multiple regression analysis can be conducted. First, since predictor and moderator variables are generally highly correlated with the interaction terms (Frazier, Tix & Barron, 2004), the quantitative predictors and moderators should be mean centered to reduce problems associated with multicollinearity and to simplify the interpretation of the regression model (Gelman & Hill, 2007). Consequently, for Macro voids, Product market voids, Managerial experience and Degree of Internationalisation, a new variable is created by deducting the mean of the old variable. Then, product terms are created, multiplying each predictor by each moderator variable. Now, the regression analysis can be conducted. The hierarchical multiple regression analysis consists of four steps, where the control variables, the predictors, the moderators and the interaction terms are added consecutively.

Missing values were handled by excluding cases listwise. As a result, SPSS gives a warning that a number of variables are constants or have missing correlations. Consequently, it has deleted the following variables from the analysis: Russia, Westbank and Gaza, and Sectors 111, 140, 1700, 4010, 4521, 6411, 7122, 7260, 7411, 7413, 7414, 7422, 7491, 7523, 9213, 9219, and 9301. Since Russia was the reference category for the dummy variable

country, SPSS has excluded Egypt, which is now the country with most respondents and thus the new reference category. The SPPS output can be found in Appendix M.

Table 6 shows the model summary. R^2, the coefficient of determination, shows how much of the variability in the dependent variable, Innovation, is accounted for by the predictors (Field, 2013). However, looking at the Adjusted R^2 makes comparing across regression equations easier, since it makes allowances for the degrees of freedom for each model (Hair et al., 2014). The Adjusted R^2 = .353, which means that 35.3 % of variance in innovation is accounted for by the control variables. Adjusted R^2 shows an increase with every subsequent model. All change statistics are significant. Although the increase of Adjusted R^2 for model 4 is only .001, this model still has the highest explained variance and will be used. The F-ratio tests the hypothesis that at least one independent variable delivers a significant contribution to the model (Field, 2013). It is significant for all models. For model 4, $F(287,19186) = 45.794$, $p < .001$.

Table 6. Model Summary

Model	Adjusted R Square	F Change	df1	df2	Sig. F Change
1	.353	39.515	276	19197	.000
2	.368	225.984	2	19195	.000
3	.397	305.290	3	19192	.000
4	.398	6.472	6	19186	.000

Before assessing the regression coefficients, it is important to establish that there is no multicollinearity, which refers to correlation among the independent variables. To meet this assumption, the tolerance value cannot be < .10 and/or the VIF cannot be > 10 (Hair et al., 2014). All values are sufficient. The highest VIF (Industry – retail) = 9.09, which is quite high, but still sufficient.

Table 7 gives the regression coefficients. In model 1, all control variables are significant at the .05 significance level. For Country and Sector, not all dummies are significant, but that is not a problem since the variable has a significant effect if at least one of the dummies is significant. For Industry, both Industry – retail ($B = .242$, $p < .01$) and Industry – other services ($B = .136$, $p < .05$) have positive significant effects. This means that they differ significantly from the reference category, manufacturing.

In model 2, the predictor variables are added. The control variables are still significant at the .05 significance level. The two main effects are significant as well ($p < .001$). Since Macro voids and Product market voids are centered, the first-order effect represents the effect

of those variables on the dependent variable at the average level of the other variables (Frazier et al., 2004). The unstandardized coefficient, B, portrays this effect. Both Macro voids (B = .034, p < .001) and Product market voids (B = .021, p < .001) have a positive effect on Innovation. A negative effect was hypothesised, thus hypothesis 1a (Macro voids) and hypothesis 1b (Product market voids) are not supported.

In model 3, the moderator variables are added. The control and predictor variables are still significant at the .05 significance level, except for legal status (p = .549). Human capital (B = .671, p < .001) and Degree of internationalisation (B = .054, p < .001) are significant and have a positive effect on Innovation. Managerial experience is not significant (p = .504). Since no hypotheses were drawn considering the main effects of those variables, the attention will turn to model 4.

Table 7. Regression coefficients

Variable	Model 1	Model 2	Model 3	Model 4
R&D	1.756***	1.701***	1.519***	1.515***
Firm age	.045**	.044**	.039*	.038*
Firm size	.420***	.422***	.227***	.230***
Legal Status	.058*	.078**	.017	.014
Macro voids		.034***	.031***	.028***
Product market voids		.021***	.015***	.009
Human capital			.671***	.667***
Managerial experience			-.006	-.004
Degree of internationalisation			.054***	.054***
Macro voids * Human capital				.013**
Macro voids * Managerial experience				-.003*
Macro voids * Degree of internationalisation				-.001
Product market voids * Human capital				.014
Product market voids * Managerial experience				.010**
Product market voids * Degree of internationalisation				.003

* p < .05
** p < .01
*** p < .001

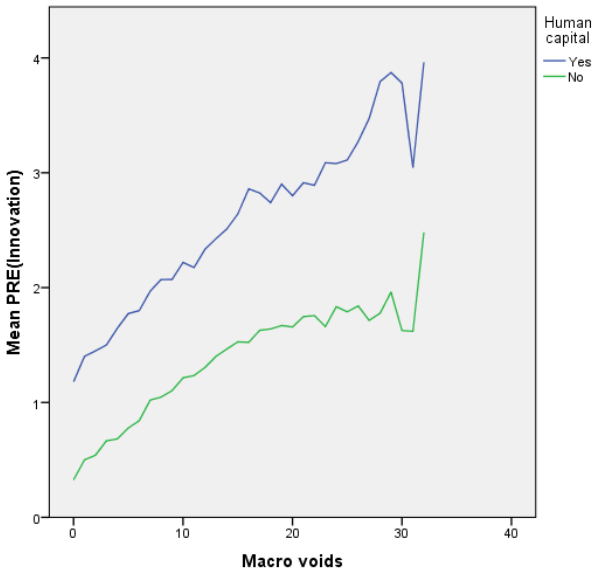
In model 4, the interaction terms are added. Legal Status (p = .618) and Managerial experience (p = .621) are still not significant. Moreover, Product market voids is not significant anymore (p = .082). Three out of six interaction effects are significant: Macro

voids * Human capital (B = .013, p < .01), Macro voids * Managerial experience (B = -.003, p < .05), and Product market voids * Managerial experience (B = .010, p < .01). The other three interaction effects are not significant. For the interaction term of Product market voids and Human capital, p = .086. Since the interaction terms of Degree of internationalisation with Macro voids (B = -.001, p = .504) and Product market voids (B = .003, p = .345) are not significant, hypothesis 2c, considering the moderating effect of Degree of internationalisation, is not supported.

Since hypotheses 1a and 1b were not supported and the effect of institutional voids on innovation is not negative, but positive, it is difficult to test hypotheses 2a and 2b regarding the moderation. These hypotheses state that human capital (2a) and managerial experience (2b) weaken the negative impact of institutional voids on innovation. The theory underlying these hypotheses is that resources enable firms to deal with institutional voids and that resources have a positive effect on innovation. Consequently, in this case, the hypotheses would be supported if human capital and managerial experience strengthen the positive effect of institutional voids on innovation.

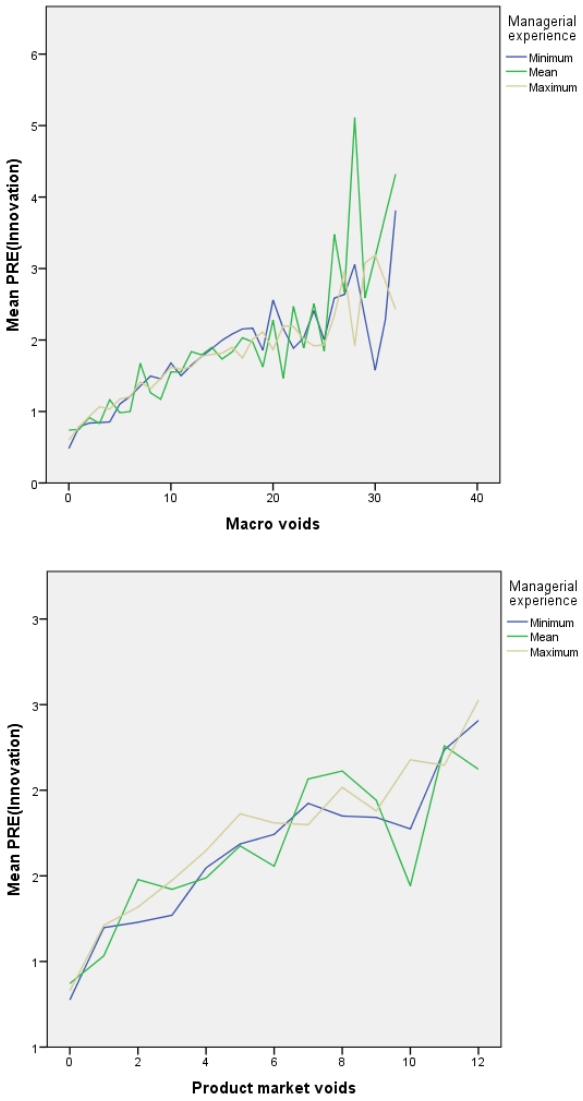
In model 4, Macro voids have a positive significant effect on Innovation and B = .028. The interaction term Macro voids * Human capital has a B of .013. Thus, Human capital positively moderates the effect of Macro voids on Innovation. The interaction term Product market voids * Human capital does not have a significant effect. To interpret the form of the moderator effects, the unstandardized predicted values were saved. With these values, a line chart is made. The predicted values are plotted against the Macro voids at different values of Human capital. The chart is displayed in figure 1 and shows that Macro voids have a higher positive effect on Innovation for firms with Human capital, compared to firms without Human capital. Concluding, hypothesis 2a is supported considering Macro voids.

Figure 1. The moderating effect of Human Capital



Hypothesis 2b considers the moderating effect of Managerial experience. The main effect of Macro voids is .028. For Macro voids * Managerial experience, B = -.003. The negative interaction effect shows that Managerial experience negatively moderates the relationship between Macro voids and Innovation. Although the main effect of Product market voids is nonsignificant, the interaction term has a positive significant effect on Innovation, B = .010. Consequently, Managerial experience positively moderates the relationship between Product market voids and Innovation. Again, to interpret the form of the moderator effects, a line chart is made (Figure 2). Now, the predicted values are plotted against the Macro and Product market voids at different values of Managerial experience. Since Managerial experience has a lot of values, a new variable is computed with several categories: the minimum, the maximum, and the mean. For Macro voids, the chart does not show an unambiguous moderating effect. However, when looking closely one can see that the mean and the minimum level line have several peaks and that either one of them is above the other two lines at most points. Consequently, the lower Managerial experience, the higher is the effect of Macro voids on Innovation. The chart for Product market voids does not show an unambiguous effect either but is easier to interpret than the former one. Here, the minimum level line is always below the mean and maximum level lines. Moreover, at most points, the maximum level line is above the mean line. Thus, the greater Managerial experience, the higher is the effect of Product market voids on Innovation. Concluding, hypothesis 2b is supported considering Product market voids.

Figure 2. The moderating effect of Managerial Experience



4.4 Validation of the results

In order to check the quality of the model, the data should be validated (Gelman & Hill, 2007). The results can be validated in a number of ways. The most preferred method is to draw another sample from the population and assess if the results from the two samples correspond (Hair et al., 2014). Unfortunately, it is not within my means to do this. A second method is to examine the adjusted R^2 value and compare it with the normal R^2 value (Hair et al., 2014). For model 4, the adjusted R^2 is .398 compared to an R^2 of .406. This small difference indicates that there is no overfitting of the data.

5. Discussion

5.1 Institutional voids

The results regarding the institutional voids were surprising. Macro voids have a positive effect on innovation. This is contrary to hypothesis 1a, which states that macro voids would have a negative impact on firm innovation in emerging markets. Consequently, hypothesis 1a is not supported. For product market voids, the same is applicable. Hypothesis 1b states that product market voids would have a negative impact on firm innovation in emerging markets. In model 1-3, product market voids have a positive effect on innovation. In model 4, there is still a small positive effect, but this effect is not significant. The insignificance could be due to the interaction terms that were added in model 4 (see section 5.5). Either way, hypothesis 1b is not supported either. The results contrast with earlier research and with the literature supporting the hypotheses (see Anokhin & Schulze, 2009; Barasa et al., 2017; Chadee & Roxas, 2013; Srholec, 2011; Zhu et al., 2011).

How can this positive effect of institutional voids on innovation be explained? A first explanation can be found in the data. Respondents were local firms, and most of them were small (51.5 %) and medium-sized (32.2 %). The literature on emerging market MNEs (hereafter: EMNEs) shows that EMNEs have distinct ownership advantages. They have a deep understanding of customer needs in emerging markets and possess the ability to function in difficult business environments (Ramamurti, 2012). In particular, they are better at operating in the poorly developed institutional environments in which they reside (Hennart, 2012). This applies to EMNEs, but it might also apply to local firms from emerging markets. Consequently, the theory underlying the hypotheses might be more applicable to developed market MNEs (hereafter: DMNEs) that seek to invest in emerging markets, than it is to EMNEs. More so, it might not even be applicable at all to local firms from emerging markets. This notion is supported by the following. First, within the IB literature, the idea exists that DMNEs might establish joint ventures with local emerging market firms to access resources that counteract the negative effects of the weak institutional context in those emerging markets (Meyer, Estrin, Bhaumik & Peng, 2012; Saka-Helmhout & Geppert, 2011). From this, it can be concluded that those local firms possess the resources to deal with the institutional context at home. Secondly, the embeddedness of a firm in the institutional context of their home country should be considered. This embeddedness influences the development of distinctive competences (Saka-Helmhout & Geppert, 2011). Local firms are

usually embedded more strongly in their home environment than MNEs. Thus, MNEs are generally less affected by local idiosyncrasies. Concluding, while local firms possess the resources to counteract the negative effects of institutional voids in their home markets, both EMNEs and DMNEs possess these resources in a lesser extent or not at all. Unfortunately, the data of the WBES does not facilitate a means of testing this explanation.

The aforementioned solution resides in the predominant view that institutional voids are constraints (see Doh et al., 2017; Khanna & Palepu, 2010; Nkya, 2003; Rodrik, 2000; Schmieding, 1991). Until now, that is the view that this study employed. However, to be able to explain the results, the focus shifts to the less popular view that sees institutional voids as enabling (see Mair & Marti, 2009; Mair et al., 2012; McKague et al., 2015; Venkataraman et al., 2016). In particular, it could be possible that institutional voids enable innovation in emerging markets.

In this view, institutional voids are perceived as 'opportunity spaces' (Mair & Marti, 2009; Mair et al., 2012; McKague et al., 2015; Venkataraman et al., 2016), that can become enabling when firms enact them (Doh et al., 2017). According to Mair & Marti (2009), institutional voids appear during institutional abundance and point at the absence of institutions that support markets in a context that is already rich in other institutional arrangements. Institutional voids are the outcome of the conflict, collision, and shift among institutions (Mair & Marti, 2009), they result from the "conflict and contradiction among local political, community, and religious institutional sphere" (Mair et al., 2012, p. 820) and from "conflicting institutional demands, norms, and reinforcing mechanisms" (Mair et al., 2012, p. 828). In line with this, Mair et al. (2012) found that property rights and autonomy often conflict with local community and political and religious spheres in Bangladesh.

Within the enabling view of institutional voids, each institutional void is seen as an "actionable construct, that can be reacted to or shaped" (Doh et al., 2017, p. 294). As 'opportunity spaces', institutional voids can provide opportunities for strategic action (Van Wijk & Saka-Helmhout, 2017), and in particular for innovation. If there is a misalignment between institutionalized rules and situational demands, a conflicting situation exists. This conflict makes actors more intentional and self-conscious and, in turn, enables those actors to change or challenge institutional voids. Then, a gap exists which provides firms with opportunities for innovation activities (Saka-Helmhout & Geppert, 2011).

Looking at the results, this notion is supported. Macro voids and product market voids have a positive effect on innovation in emerging markets. Apparently, firms can enact the institutional voids as a result of which the voids provide opportunities for innovation. Now, it is the question: how do firms enact the institutional voids? Unfortunately, finding the answer to this question lies outside the scope of this thesis, but it offers an interesting direction for future research (see section 6.4).

Supporters of the enabling view of institutional voids criticise the constraining view. In short, the criticism entails that there is not one specific type of institution that is compatible with a well-functioning economy (Mair et al., 2012). In fact, that formal institutions are lacking or absent, does not mean that there are no informal institutional arrangements that serve as an alternative. The lack or absence of formal institutions even opens up the market for private firms to offer the functions normally provided by those institutions (Doh et al., 2017). Formal institutions are constitutions, laws, property rights, and governmental regulations, while informal institutions consist of customs, social norms, traditions, and religious beliefs (Mair et al., 2012). Thus, the institutional context is made up of formal and informal institutions. It is important to look at the full picture including both those kinds of institutions (Mair et al., 2012).

Although Khanna and Palepu (2010) recognize that the development, form, and function of institutions and the existence of institutional voids are affected by politics, history, and culture, they do not explicitly include informal institutions in their conceptualization of institutional voids. Consequently, it might give a limited understanding of the institutional infrastructure in its totality (Mair & Marti, 2009). This might explain the results. It is possible that firms who do not have access to (adequate) formal institutions do have access to informal institutions, such as networks, government relations, local community, religious beliefs (Mair et al., 2012), and clan-based norms (Helmke & Levitsky, 2004), which enable them to innovate. For example, maybe courts (macro voids) are perceived as an obstacle to business operations, but this does not mean that local communities do not have other ways of resolving their disputes. Again, investigating this lies outside the scope of this thesis.

Thus, although the hypotheses were not supported, a contribution to the literature is made by giving alternative explanations for the results. This thesis began by employing a constraining view on institutional voids, but as it turns out, this view does not hold. The results support the enabling view of institutional voids and add to that stream of literature. Unfortunately, it is not possible to test the alternative explanations, because the dataset from

the WBES does not provide the necessary measures to assess if the explanations are true. Furthermore, it would be outside the scope of this master thesis to investigate the alternative solutions. However, the results do provide directions for future research (see section 6.4).

5.2 Resources

Because the influence of resources on innovation is already established extensively in the literature (Abedoye, 1997; Barasa et al., 2017; Hadjimanolis, 2000b; Mahemba & De Bruijn, 2003), no hypotheses were drawn. As expected, the resources and firm characteristics that were used as control variables (R&D, firm age, and firm size) and one of the moderators (human capital), all have significant effects on innovation.

The second moderator, managerial experience, had a very small negative effect on innovation. However, this effect was not significant. Maybe, experienced managers might become less intentional and less self-conscious. As a consequence of that they only pursue the status quo and no longer look for innovation opportunities that might be present in the environment.

In contrast, the results confirm that R&D is, indeed, a prerequisite for innovation (see Barasa et al., 2017; Chudnovsky et al., 2006; Fagerberg et al., 2010; Mahemba & De Bruijn, 2003; Ritter et al., 2016; Robson et al., 2008), and that a firm's size is positively related to innovation. Large firms are more innovative than small or medium-sized firms (see Ayyagari et al., 2012; Bogliacino et al., 2009; Chudnovsky et al., 2006; Robson et al., 2008). The results also show that human capital is positively related to innovation. As expected, formal education and on-the-job training of workers strengthens the quality of human resources and enhances a firm's absorptive capacity (see Barasa et al., 2017). Human capital even has a relatively large effect on innovation. From the predictors that were used, only R&D had a larger effect.

Lastly, firm age does affect innovation, but the effect is in the opposite direction. A firm's age should be inversely related to innovation (see Ayyagari et al., 2012; Radas & Božiç, 2009), however, the results show that older firms are more innovative. Although this result is not as expected, it can be explained. It is highly probable that an older firm has more accumulated resources and more market knowledge (Hadjimanolis, 2000a). As became clear, resources are very important to innovation (see section 2.3). Specifically, market knowledge has a positive relationship with innovation, because risks and (innovation) opportunities can

be recognised more easily and because it enhances a firms' ability to develop new technologies (Robson et al., 2008).

The aforementioned results confirm existing knowledge on resources and innovation in emerging markets. The positive effect of resources on innovation is affirmed. Innovation is essential to firm performance (see section 1.1), especially in emerging markets, where it contributes to income growth and economic development (Bradley et al., 2012; Organisation for Economic Co-operation and Development, 2012). Given the importance of innovation, it is imperative to investigate which resources are linked to innovation, and in what way (Hadjimanolis, 2000a). That is exactly what this study has done.

5.3 Degree of internationalisation

The results show that the degree of internationalisation has a positive effect on innovation in emerging markets. Indeed, exporters are more innovative than non-exporters (see Ayyagari et al., 2012; Hadjimanolis, 2000b; Ritter et al., 2016). A higher degree of internationalisation means that firms can expand their geographic network. This network brings them in contact with ideas from other countries (see Robson et al., 2008) and enables them to learn about and from innovation activities of firms from other countries (see Yamakawa et al., 2008). Concluding, the results affirm existing literature on the effects of degree of internationalisation on innovation in emerging markets.

5.4 The mitigating effect of resources and degree of internationalisation

The results show that hypothesis 2a is partly supported. Human capital positively moderates the positive effect of macro voids on innovation. In other words, macro voids have a higher positive effect on innovation for firms with human capital, compared to firms without human capital. As expected, human capital enhances a firm's absorptive capacity, which in turn provides windows of opportunity for innovation, enables a firm to access knowledge about uncertainties and risks, and decreases transaction costs (see Robson et al, 2008; Zahra & George, 2002). The findings also fit with the enabling view of institutional voids. Education and training of workers can provide them with knowledge on how to enact institutional voids. In that way, educated and trained workers are able to capture the opportunities for innovation that institutional voids provide.

Secondly, the moderator effect of managerial experience was tested. Although the main effect of managerial experience is not significant, the interaction terms of managerial experience with macro voids and with product market voids are. The results show that there is some support for hypothesis 2b. Managerial experience positively moderates the positive effect of product market voids on innovation. The more experience the manager has, the greater is the positive effect of product market voids on innovation. As hypothesised, an experienced manager is better able to understand the institutional environment; he/she more easily deciphers windows of opportunity, institutional voids, and their effect on innovation; and he/she can use his/her extensive social network to reduce transaction costs. In contrast, there is a negative moderator effect of managerial experience on the effect of macro voids on innovation. Apparently, an experienced manager reduces the positive effect of macro voids on innovation. In section 5.4 the possibility was offered that firms who do not have access to (adequate) formal institutions do have access to informal institutions that do enable them to innovate. Experienced managers may be more embedded in local government networks. Because of this, the more experienced a manager becomes, the more inclined he/she becomes to use the formal institutions in the macro environment instead of the informal institutions. Another reason for the negative moderation effect is that experienced managers might become less intentional and less self-conscious, prohibiting them to fully enact the voids and seize opportunities.

The last hypothesis (2c) regarding the moderator effect of degree of internationalisation is not supported. The interaction terms of degree of internationalisation with macro voids and with product market voids are insignificant. The basis of hypothesis 2c is that firms could steer clear of institutional voids in their home market, or that their exporting activities would lead to organizational learning providing them with knowledge about uncertainty and risk and with windows of opportunity for innovation. Unfortunately, this perspective is not supported by the results. The degree of internationalisation does not moderate the relationship between institutional voids and innovation. The WBES does not inform us to which countries firms export. Maybe they export to other emerging markets that have their own institutional voids. If that is the case, firms cannot steer clear of institutional voids.

5.5 Control variables

As expected, the country (see Fagerberg et al., 2009), industry (see Østergaard et al., 2011; Ritter et al., 2016) and sector (see Barasa et al., 2017; Ritter et al., 2016; Srholec, 2011)

in which a firm is active, influence innovation. This study contributes to the existing literature by confirming that the country, industry, and sector in which a firm resides determine innovation in emerging markets.

Legal status had a positive effect in model 1 and 2, but after adding the moderator variables (model 3) and the interaction effects (model 4) this effect was not significant anymore. Thus, this study only mildly supports the findings of Ayyagari et al. (2012) that firms organized as corporations innovate more than unincorporated forms of business. This result is partly in line with those of Barasa et al. (2017), who did not find a significant effect of legal status on innovation in East-Africa.

6. Conclusion

6.1 Theoretical implications

This thesis contributes to the literature by showing that the effect of institutional voids on innovation in emerging markets is moderated by resources. The results increase our knowledge of how macro and product market voids influence firm innovation in emerging markets (positively), and which resources moderate those effects (human capital and managerial experience). While human capital positively moderates the effect of macro voids, it does not moderate the effect of product market voids, and while managerial experience moderates the effect of product market voids in a positive way, it moderates the effect of macro voids in a negative way. Hence, the relationship of different types of voids (macro and product market voids) with innovation is moderated in different ways.

Thus, the main finding of this study is that macro voids and product market voids do not form an obstacle to innovation in emerging markets. On the contrary, macro voids and product market voids have a positive influence on innovation in those markets. This is an important finding, as most literature sees institutional voids as obstacles. The theory on the constraining role of institutional voids is disproved and support is found for the less popular view that institutional voids are opportunities that enable strategic action when firms enact them.

Moreover, the findings on the interaction effects show that this positive effect of institutional voids on innovation can even be enhanced by using the relevant resources. When dealing with product market voids, it is beneficial to have managerial experience. For firms handling macro voids, having human capital has positive effects on innovation. Also, some resources might decrease the positive effect of institutional voids on innovation. The findings show that managerial experience negatively influences the effect of macro voids on innovation.

Lastly, the finding that the degree of internationalisation is important for innovation in emerging markets emphasizes the importance of globalisation. Globalisation is essential, especially for firms from emerging markets, where income growth and the introduction of better living standards are needed. In that way, emerging markets can reach the same level of development as developed markets.

6.2 Managerial implications

First, there are some managerial implications of the main findings. The findings demonstrate that macro voids and product market voids provide firms with opportunities for innovation. Now that that is clear, firms should make sure that they reap the benefits of these opportunities. Thus, firms should not avoid void-characterised markets. On the contrary, they should actively enact the institutional voids.

Secondly, the findings on the interaction effect show that firms can actively and purposefully use their resources to capture more of the positive effect of institutional voids on innovation. Are macro voids present, then firms should invest in their human capital. They can erect training programs for their employees, or change their hiring policy and hire more employees that enjoyed a secondary education. Also, they can invest directly in the education of their employees and could choose to pay their school fees. In the presence of product market voids, managerial experience enhances the positive effect of the void on innovation. Here, firms can invest as well. They should pay attention to the former experience of managers they hire. Since managerial experience decreases the positive effect of macro voids on innovation, firms should be careful with investing in their managers if macro voids are present as well. A last recommendation pertaining to both human capital and managerial experience can be made. Those resources both concern people. Within the field of human resource management, a lot has been written on how to keep your employees happy, and how to make sure that they want to stay at your firm. Firms should invest in human resource managers to ensure the quality of their employees and of their managers.

Lastly, regarding managerial experience, this resource alone was not relevant for innovation in emerging markets. Other variables that were proven to have a positive influence on innovation are human capital, R&D, firm size, firm age, and degree of internationalisation. Of these, especially human capital and R&D were important antecedents of innovation. When looking to be an innovative firm, firms should really invest in their human capital (as already elaborated upon above) and in R&D.

6.3 Limitations of conducted research

This research has several limitations. First, the innovation concept is captured in one variable. Consequently, different forms of innovation were not assessed individually. Secondly, there was no sufficient measure available for labour and capital market voids in the

WBES. Unfortunately, this means that it was not possible to assess the relationship between labour market voids and capital market voids on the one hand, and innovation in emerging markets on the other hand. Consequently, the institutional voids concept is not measured entirely. Thirdly, the human capital concept is not measured fully, since only a measure for training is used and none for education. Lastly, to be able to conduct a multiple regression analysis, some variables had to be converted into dummy variables. With the use of dummy variables, the effect will have to be interpreted with respect to a reference group. This means that the differences between specific categories as well as the effect of a particular category cannot be tested (Cohen & Cohen, 1983).

The foregoing limitations all stem from the fact that research was conducted with a given data set. The last limitation pertains to the results. The direction of the effect of macro voids and product market voids on innovation was not as expected. Consequently, the theory supporting the hypotheses was not confirmed. In section 5.1 some alternative explanations for the results are given. As already discussed in that section, testing these alternatives is not done in this thesis. This forms a limitation to the research since the results cannot be explained fully. Nonetheless, the results do provide directions for future research.

6.4 Directions for future research

In section 5.1 several explanations for the results are given. First, it is a possibility that the theory underlying the hypotheses is more applicable to DMNEs (and EMNEs) than it is to SMEs from emerging markets. If that is the case, then the question is: do institutional voids form constraints for DMNEs, or can they also enact the voids so that they become enabling? If they are constraining, the question arises of how MNEs can counteract institutional voids. El Ghoul, Guedhami & Kim (2017) argue that corporate social responsibility activities might help MNEs to overcome transaction costs that stem from institutional voids. This strategy and other possible ways in which MNEs can mitigate the negative effects of institutional voids provide a useful direction for future research. Related to this is the question if there is a difference in the way that DMNEs, EMNEs, and local firms perceive institutional voids: are they constraining or enabling?

This brings up a more general question: how do firms enact institutional voids to provide opportunities for innovation in emerging markets? Within the enabling view of institutional voids, this is a much-debated notion, but research on how firms actually enact

institutional voids is scarce. Future research should give more insight into how firms can enact institutional voids and what the consequences are of this enactment.

In section 5.1, it was also suggested that firms who do not have access to (adequate) formal institutions do have access to informal institutions, which enable them to innovate. Although Khanna and Palepu's (2010) conceptualization of institutional voids does provide a systematic approach to institutional voids, it does not explicitly include informal institutions. Future research can unravel the distinction between formal and informal institutions, investigate if these informal institutions do function adequately, and examine how to integrate informal institutions in Khanna and Palepu's distinction between product market voids, labour market voids, capital market voids, and macro voids.

The foregoing presents another direction for future research. In this thesis, only product market voids and macro voids are considered. The effect of labour and capital market voids on innovation in emerging markets is not investigated. Future research could assess the relationship between labour and capital market voids and innovation in emerging markets. The findings also show that the relationship between macro voids and product market voids on the one hand, and innovation on the other hand, is moderated in different ways. Are there other resources that moderate this relationship? And, can the relationship between labour market voids and capital market voids and innovation be moderated as well?

As elaborated upon in section 6.3, the innovation concept is captured in one variable, which consists of different forms of innovation. It might be possible that those different forms of innovation are influenced differently by institutional voids. This idea is not investigated much, since most research solely investigates product innovation (see Table 1). Moreover, Robson et al. (2008) found that different forms of innovation are influenced differently by various variables (sector, family business, growth, and size of the firm). Also, product innovation is more high-skill intensive than process innovation (Goedhuys & Veugelers, 2012). Future research can investigate the relationship between different institutional voids and different forms of innovation in emerging markets. Another issue that is not touched upon in this thesis is if institutional voids influence the amount of innovation activities that firms employ. The results show that institutional voids positively influence that firms innovate, but not how much innovation activities they engage in.

Another direction for future research considers human capital. Human capital is important for innovation. It not only has a positive influence on innovation, it also enhances

the positive relationship between macro voids and innovation. Future research can examine what kind of training is important. Since training of workers has a positive influence on innovation because it increases a firm's absorptive capacity, future research could also investigate the relationship between training and absorptive capacity and innovation in more detail.

Lastly, it became clear that a firm's degree of internationalisation positively influences its innovation activities. This leaves us wondering if this relationship is influenced by other factors. For example, does the country to which a firm internationalises matter, and, does psychic distance (Johanson & Wiedersheim-Paul, 1977) play a role in this? Another question relates to the type of international activity that a firm engages in. For example, does the intensity and commitment of economic linkages play a role? Considering the adoption of CSR practices Marano & Kostova (2016) suggest that foreign direct investment ties exert more institutional pressures because they are more salient than trade-based ties. Future research could investigate if this is also applicable to innovation.

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Appendices

Appendix A: Countries

		Frequency	Percent
Country	Albania	351	1.3
	Armenia	355	1.3
	Azerbaijan	362	1.3
	Bangladesh	1431	5.1
	Belarus	352	1.3
	Bosnia and Herzegovina	360	1.3
	Bulgaria	290	1.0
	Croatia	359	1.3
	Czech Republic	247	.9
	Democratic Republic of Congo	483	1.7
	Djibouti	247	.9
	Egypt	2690	9.7
	Estonia	271	1.0
	Georgia	351	1.3
	Ghana	684	2.5
	Hungary	303	1.1
	Israel	477	1.7
	Jordan	517	1.9
	Kazakhstan	576	2.1
	Kenya	762	2.7
	Kosovo	201	.7
	Kyrgyz Republic	268	1.0
	Latvia	318	1.1
	Lebanon	526	1.9
	Lithuania	245	.9
	Moldova	344	1.2
	Mongolia	347	1.2
	Montenegro	148	.5
	Morocco	368	1.3
	Nepal	480	1.7
	Pakistan	1128	4.1
	Poland	504	1.8
	Republic of Macedonia	359	1.3
	Romania	532	1.9
	Russia	3418	12.3

	Serbia	353	1.3
	Slovakia	261	.9
	Slovenia	270	1.0
	Takijstan	317	1.1
	Tanzania	677	2.4
	Tunisia	589	2.1
	Turkey	1266	4.5
	Uganda	747	2.7
	Ukraine	908	3.3
	Uzbekistan	376	1.4
	Westbank and Gaza	381	1.4
	Yemen	346	1.2
	Zambia	686	2.5
	Total	27831	100.0

Appendix B: Sectors

		Frequency	Percent
Sector	111	1	.0
	122	2	.0
	140	1	.0
	192	1	.0
	1410	2	.0
	1500	4	.0
	1511	196	.7
	1512	90	.3
	1513	167	.6
	1514	95	.3
	1520	159	.6
	1531	364	1.3
	1532	12	.0
	1533	93	.3
	1541	625	2.2
	1542	21	.1
	1543	149	.5
	1544	43	.2
	1549	374	1.3
	1551	51	.2
	1552	33	.1

	1553	29	.1
	1554	155	.6
	1583	1	.0
	1593	3	.0
	1600	27	.1
	1700	1	.0
	1711	366	1.3
	1712	104	.4
	1721	163	.6
	1722	61	.2
	1723	42	.2
	1729	126	.5
	1730	171	.6
	1810	1347	4.8
	1820	28	.1
	1911	135	.5
	1912	25	.1
	1920	218	.8
	2010	171	.6
	2021	65	.2
	2022	196	.7
	2023	27	.1
	2029	77	.3
	2097	1	.0
	2101	81	.3
	2102	79	.3
	2109	92	.3
	2200	3	.0
	2211	94	.3
	2212	85	.3
	2213	2	.0
	2219	30	.1
	2221	372	1.3
	2222	66	.2
	2230	8	.0
	2310	2	.0
	2320	27	.1
	2330	2	.0
	2400	1	.0
	2411	94	.3

	2412	41	.1
	2413	35	.1
	2421	38	.1
	2422	191	.7
	2423	191	.7
	2424	203	.7
	2429	158	.6
	2430	15	.1
	2511	17	.1
	2519	81	.3
	2520	607	2.2
	2600	1	.0
	2610	130	.5
	2691	65	.2
	2692	75	.3
	2693	159	.6
	2694	101	.4
	2695	348	1.3
	2696	268	1.0
	2699	95	.3
	2710	175	.6
	2720	53	.2
	2731	65	.2
	2732	34	.1
	2810	1	.0
	2811	419	1.5
	2812	57	.2
	2813	10	.0
	2891	38	.1
	2892	70	.3
	2893	76	.3
	2899	403	1.4
	2911	33	.1
	2912	58	.2
	2913	30	.1
	2914	16	.1
	2915	65	.2
	2919	107	.4
	2921	84	.3
	2922	49	.2

	2923	17	.1
	2924	48	.2
	2925	34	.1
	2926	6	.0
	2927	7	.0
	2929	89	.3
	2930	73	.3
	3000	16	.1
	3110	69	.2
	3120	59	.2
	3130	48	.2
	3133	1	.0
	3140	14	.1
	3150	45	.2
	3190	119	.4
	3210	33	.1
	3220	17	.1
	3230	16	.1
	3311	72	.3
	3312	70	.3
	3313	28	.1
	3320	21	.1
	3330	3	.0
	3410	30	.1
	3420	36	.1
	3430	82	.3
	3500	1	.0
	3511	28	.1
	3512	11	.0
	3520	15	.1
	3530	5	.0
	3591	5	.0
	3592	5	.0
	3599	10	.0
	3600	1	.0
	3610	812	2.9
	3691	60	.2
	3692	2	.0
	3693	13	.0
	3694	12	.0

	3699	64	.2
	3710	19	.1
	3720	27	.1
	4010	3	.0
	4030	6	.0
	4500	8	.0
	4510	61	.2
	4520	984	3.5
	4521	1	.0
	4530	415	1.5
	4540	179	.6
	4550	14	.1
	5000	3	.0
	5010	145	.5
	5020	354	1.3
	5030	238	.9
	5040	26	.1
	5050	204	.7
	5100	4	.0
	5110	51	.2
	5121	91	.3
	5122	510	1.8
	5123	1	.0
	5131	119	.4
	5132	2	.0
	5139	377	1.4
	5141	102	.4
	5142	84	.3
	5143	445	1.6
	5149	118	.4
	5151	92	.3
	5152	91	.3
	5159	457	1.6
	5190	237	.9
	5200	9	.0
	5211	629	2.3
	5219	183	.7
	5220	947	3.4
	5231	691	2.5
	5232	457	1.6

	5233	531	1.9
	5234	464	1.7
	5236	1	.0
	5239	969	3.5
	5240	17	.1
	5248	1	.0
	5251	30	.1
	5252	73	.3
	5259	60	.2
	5260	66	.2
	5500	1	.0
	5510	678	2.4
	5520	981	3.5
	6000	4	.0
	6010	9	.0
	6021	137	.5
	6022	89	.3
	6023	253	.9
	6030	5	.0
	6110	58	.2
	6120	3	.0
	6210	13	.0
	6220	3	.0
	6240	2	.0
	6301	62	.2
	6302	29	.1
	6303	41	.1
	6304	373	1.3
	6309	89	.3
	6311	1	.0
	6411	2	.0
	6412	25	.1
	6420	124	.4
	6603	1	.0
	7010	24	.1
	7012	1	.0
	7020	20	.1
	7122	6	.0
	7200	2	.0
	7210	17	.1

	7221	60	.2
	7229	98	.4
	7230	17	.1
	7240	27	.1
	7250	69	.2
	7260	1	.0
	7290	56	.2
	7411	1	.0
	7412	1	.0
	7413	1	.0
	7414	1	.0
	7421	11	.0
	7422	1	.0
	7430	8	.0
	7491	1	.0
	7494	1	.0
	7523	1	.0
	9000	1	.0
	9213	1	.0
	9219	1	.0
	9302	1	.0
	Total	27827	100.0
Missing	System	4	.0
Total		27831	100.0

Appendix C: Factor analysis Innovation

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,831
Bartlett's Test of Sphericity	Approx. Chi-Square	41324,877
	df	10
	Sig.	,000

Communalities

	Initial	Extraction
New products/services last 3 yrs	.349	.394
New production/supply methods last 3 yrs	.458	.548
New organisational/management practices or structures last 3 yrs	.419	.499
New marketing methods last 3 yrs	.410	.492
New logistical or business support processes last 3 yrs	.437	.538

Extraction Method: Principal Axis Factoring.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.972	59.445	59.445	2.471	49.426	49.426
2	.680	13.593	73.038			
3	.521	10.415	83.452			
4	.435	8.702	92.154			
5	.392	7.846	100.000			

Extraction Method: Principal Axis Factoring.

Factor Matrix[a]

	Factor 1
New products/services last 3 yrs	.628
New production/supply methods last 3 yrs	.740
New organisational/management practices or structures last 3 yrs	.707
New marketing methods last 3 yrs	.701
New logistical or business support processes last 3 yrs	.734

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 5 iterations required.

Appendix D: Reliability Statistics Innovation

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.828	.829	5

Appendix E: Factor analysis Macro voids

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.861
Bartlett's Test of Sphericity	Approx. Chi-Square	45253.853
	Df	28
	Sig.	.000

Communalities

	Initial	Extraction
Customs and trade regulations - obstacle to current operations	.240	.284
Crime, theft, and disorder - obstacle to current operations	.245	.300
Tax administration - obstacle to current operations	.280	.340
Business licensing and permits - obstacle to current operations	.304	.365
Political instability - obstacle to current operations	.324	.272
Corruption - obstacle to current operations	.438	.470
Courts - obstacle to current operations	.304	.380
Labour regulations - obstacle to current operations	.257	.307

Extraction Method: Principal Axis Factoring.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.368	42.106	42.106	2.717	33.968	33.968
2	.997	12.465	54.571			
3	.704	8.803	63.375			
4	.671	8.391	71.766			
5	.642	8.020	79.785			
6	.615	7.688	87.473			
7	.587	7.341	94.814			
8	.415	5.186	100.000			

Extraction Method: Principal Axis Factoring.

Factor Matrix[a]

	Factor 1
Customs and trade regulations - obstacle to current operations	.533
Crime, theft, and disorder - obstacle to current operations	.548
Tax administration - obstacle to current operations	.583
Business licensing and permits - obstacle to current operations	.604
Political instability - obstacle to current operations	.522
Corruption - obstacle to current operations	.685
Courts - obstacle to current operations	.617
Labour regulations - obstacle to current operations	.554

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 4 iterations required.

Appendix F: Reliability Statistics Macro voids

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.799	.802	8

Appendix G: Factor analysis Product-market voids

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.713
Bartlett's Test of Sphericity	Approx. Chi-Square	15638.371
	df	6
	Sig.	.000

Communalities

	Initial	Extraction
Electricity - obstacle to current operations	.249	.404
Telecommunications - obstacle to current operations	.244	.368
Transport - obstacle to current operations	.268	.450
Access to land - obstacle to current operations	.124	.170

Extraction Method: Principal Axis Factoring.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.017	50.426	50.426	1.392	34.804	34.804
2	.822	20.543	70.969			
3	.602	15.061	86.029			
4	.559	13.971	100.000			

Extraction Method: Principal Axis Factoring.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.664
Bartlett's Test of Sphericity	Approx. Chi-Square	12291.074
	Df	3
	Sig.	.000

Communalities

	Initial	Extraction
Electricity - obstacle to current operations	.229	.392
Telecommunications - obstacle to current operations	.243	.429
Transport - obstacle to current operations	.232	.398

Extraction Method: Principal Axis Factoring.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.812	60.415	60.415	1.219	40.634	40.634
2	.606	20.187	80.602			
3	.582	19.398	100.000			

Extraction Method: Principal Axis Factoring.

Factor Matrix[a]

	Factor 1
Electricity - obstacle to current operations	.626
Telecommunications - obstacle to current operations	.655
Transport - obstacle to current operations	.631

Extraction Method: Principal Axis Factoring.

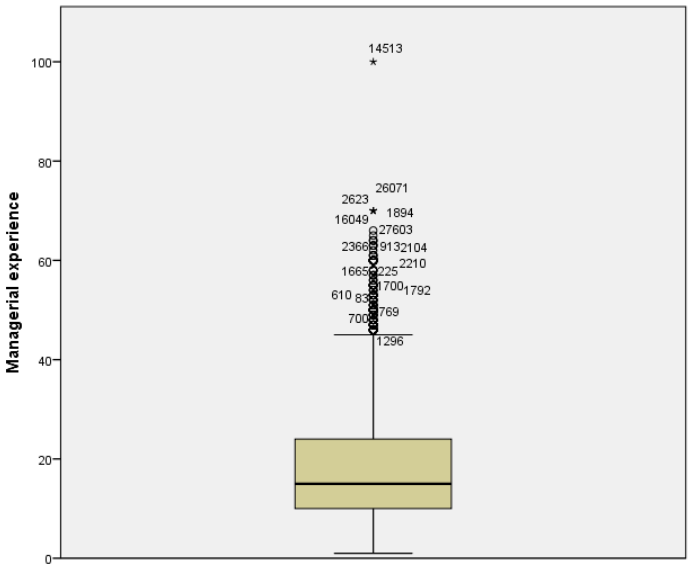
a. 1 factors extracted. 7 iterations required.

Appendix H: Reliability Statistics Product-market voids

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.666	.672	3

Appendix I: Outliers



Appendix J: Descriptive statistics

		Innovation	Macro voids	Product market voids	Human capital	Managerial experience	Degree of internationalisation
N	Valid	24067	24351	27425	27633	27229	27058
	Missing	3764	3480	406	198	602	773
Mean		1.3734	8.8128	3.3318	0.32	17.73	7.64
Std. Error of Mean		0.01106	0.04156	0.1856	0.003	0.065	0.135
Median		1	8	3	0	15	0
Mode		0	0	0	0	20	0
Std. Deviation		1.71628	6.48593	3.07408	0.466	10.656	22.252
Variance		2.946	42.067	9.450	0.217	113.552	495.15
Skewness		0.949	0.591	0.692	0.781	0.813	3.205
Std. Error of Skewness		0.016	0.016	0.015	0.015	0.015	0.015

Kurtosis		-0.501	-0.228	-0.401	-1.391	0.379	9.315
Std. Error of Kurtosis		0.032	0.031	0.03	0.029	0.03	0.03
Range		5	32	12	1	59	100
Minimum		0	0	0	0	1	0
Maximum		5	32	12	1	60	100
Sum		33054	214600	91374	8793	482742	206702
Percentiles	10	0	1	0	0	5	0
	20	0	3	0	0	8	0
	25	0	3	0	0	10	0
	30	0	4	1	0	10	0
	40	0	6	2	0	14	0
	50	1	8	3	0	15	0
	60	1	10	4	0	20	0
	70	2	12	5	1	21	0
	75	3	13	5	1	24	0
	80	3	15	6	1	26	0
	90	4	18	8	1	33	25

		Country	Sector	Industry	R&D	Firm age	Firm size	Legal status
N	Valid	27831	27827	27757	27717	27487	27828	27777
	Missing	0	4	74	114	344	3	54
Mean		35.24	3819.23	0.85	0.14	16.96	0.15	0.57
Std. Error of Mean		0.086	9.609	0.005	0.002	0.081	0.002	0.003
Median		39	4510	1	0	14	0	1
Mode		45	1810	0	0	13	0	1
Std. Deviation		14.343	1602.855	0.888	0.344	13.473	0.358	0.495
Variance		205.734	2569145	0.789	0.118	181.516	0.128	0.245
Skewness		-0.149	-0.036	0.301	2.11	2.65	1.953	-0.281
Std. Error of Skewness		0.015	0.015	0.015	0.015	0.015	0.015	0.015
Kurtosis		-1.334	-1.403	-1.666	2.452	12.698	1.815	-1.921
Std. Error of Kurtosis		0.029	0.029	0.029	0.029	0.03	0.029	0.029
Range		48	9191	2	1	189	1	1
Minimum		10	111	0	0	0	0	0
Maximum		58	9302	2	1	189	1	1
Sum		980639	1,06E+08	23551	3801	466281	4193	15819
Percentiles	10	1711	1711	0	0	5	0	0
	20	2010	2010	0	0	7	0	0
	25	2320	2320	0	0	8	0	0
	30	2520	2520	0	0	9	0	0

	40	29	2899	0	0	12	0	0
	50	39	4510	1	0	14	0	1
	60	43	5122	1	0	17	0	1
	70	45	5211	2	0	19	0	1
	75	46	5220	2	0	21	0	1
	80	50	5233	2	0	23	0	1
	90	53	5510	2	1	32	1	1

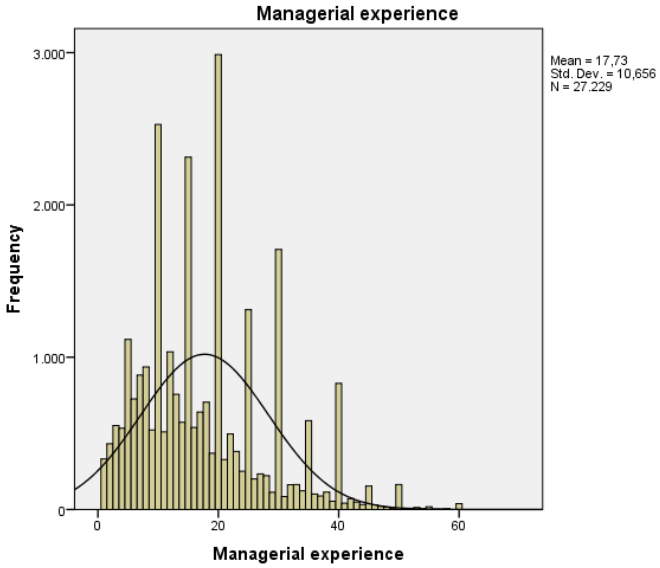
		Innovation	Macro voids	Product market voids	Human capital	Managerial experience	Degree of internationalisation
Innovation	Pearson Correlation	1	.272**	.235**	.304**	-0.005	.090**
Macro voids	Pearson Correlation	.272**	1	.557**	.042**	.021**	.020**
Product market voids	Pearson Correlation	.235**	.557**	1	.062**	-.032**	.001
Human capital	Pearson Correlation	.304**	.042**	.062**	1	.026**	.082**
Managerial experience	Pearson Correlation	-0.005	.021**	-.032**	.026**	1	.079**
Degree of internationalisation	Pearson Correlation	.090**	.020**	.001	.082**	.079**	1
Country	Pearson Correlation	.051**	-0.001	.051**	.061**	-.056**	-.034**
Sector	Pearson Correlation	-.067**	-.073**	-.087**	.061**	-.096**	-.171**
Industry	Pearson Correlation	-.060**	-.056**	-.089**	.057**	-.075**	-.131**
R&D	Pearson Correlation	.443**	.120**	.111**	.227**	.030**	.129**
Firm age	Pearson Correlation	.075**	.063**	.020**	.042**	.392**	.076**
Firm size	Pearson Correlation	.143**	.030**	0.013*	.189**	.103**	.259**

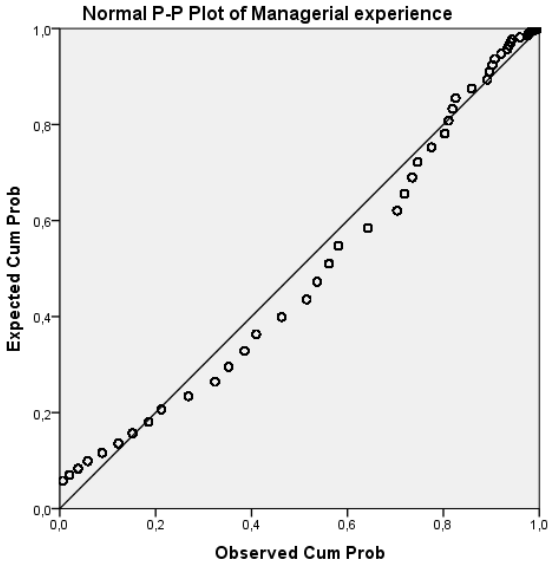
Legal status	Pearson Correlation	-.105**	-.298**	-.201**	.165**	-.020**		.038**

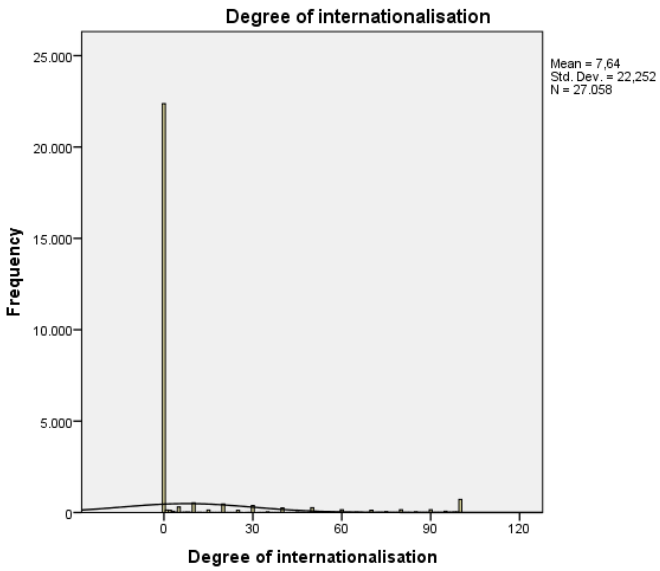
		Country	Sector	Industry	R&D	Firm age	Firm size	Legal status
Innovation	Pearson Correlation	.051**	-.067**	-.060**	.443**	.075**	.143**	-.105**
Macro voids	Pearson Correlation	-0.001	-.073**	-.056**	.120**	.063**	.030**	-.298**
Product market voids	Pearson Correlation	.051**	-.087**	-.089**	.111**	.020**	.013*	-.201**
Human capital	Pearson Correlation	.061**	.061**	.057**	.227**	.042**	.189**	.165**
Managerial experience	Pearson Correlation	-.056**	-.096**	-.075**	.030**	.392**	.103**	-.020**
Degree of internationalisation	Pearson Correlation	-.034**	-.171**	-.131**	.129**	.076**	.259**	.038**
Country	Pearson Correlation	1	.016**	.022**	.040**	-.034**	-.039**	.114**
Sector	Pearson Correlation	.016**	1	.792**	-.087**	-.130**	-.173**	.115**
Industry	Pearson Correlation	.022**	.792**	1	-.078**	-.119**	-.129**	.107**
R&D	Pearson Correlation	.040**	-.087**	-.078**	1	.080**	.148**	-0.007
Firm age	Pearson Correlation	-.034**	-.130**	-.119**	.080**	1	.202**	-.066**
Firm size	Pearson Correlation	-.039**	-.173**	-.129**	.148**	.202**	1	.082**
Legal status	Pearson Correlation	.114**	.115**	.107**	-0.007	-.066**	.082**	1

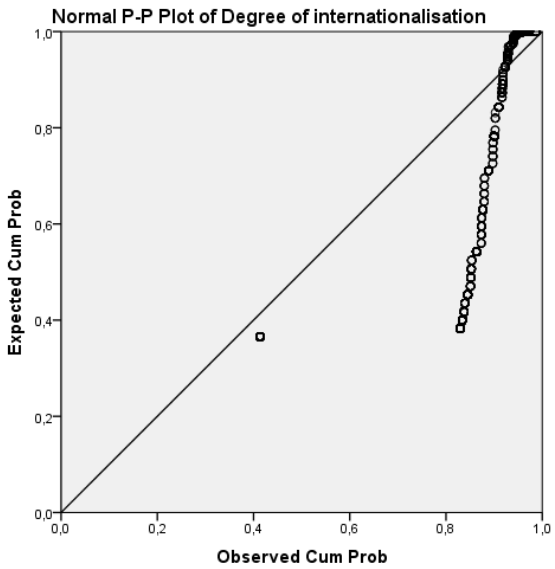
Appendix K: Normal distribution

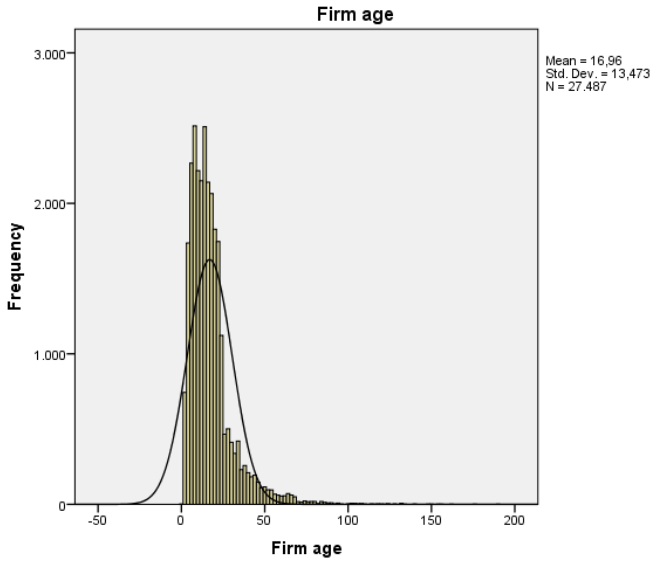
	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Innovation	.949	.016	-.501	.032
Macro voids	.591	.016	-.228	.031
Product market voids	.692	.015	-.401	.030
Managerial experience	.813	.015	.379	.030
Degree of internationalisation	3.205	.015	9.315	.030
Firm age	2.650	.015	12.698	.030

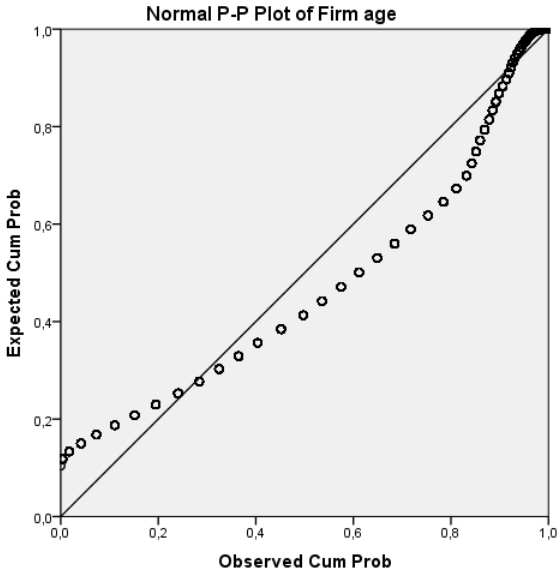




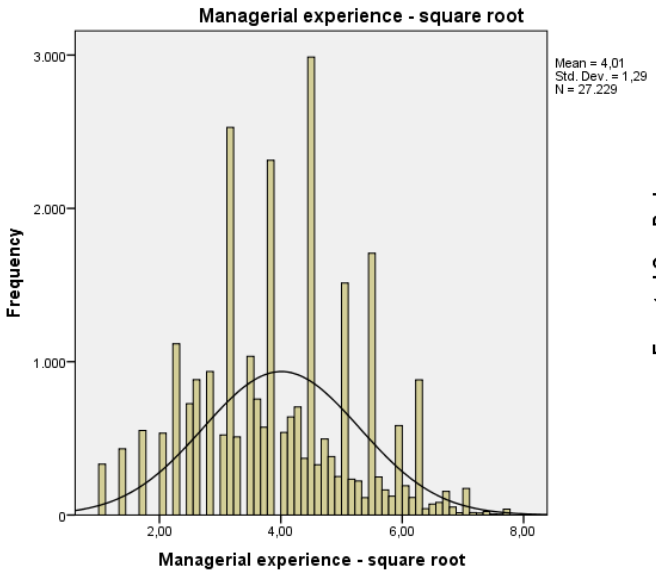


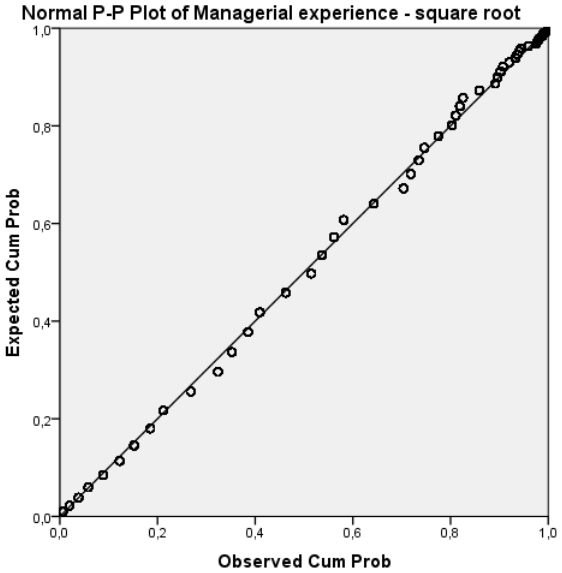


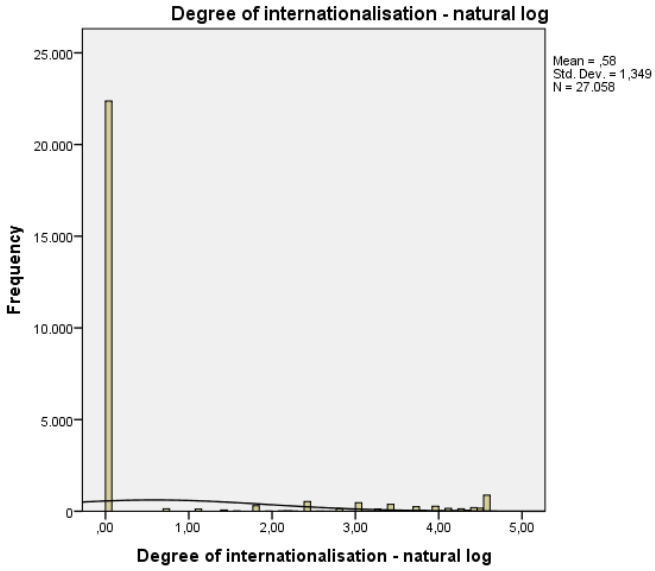


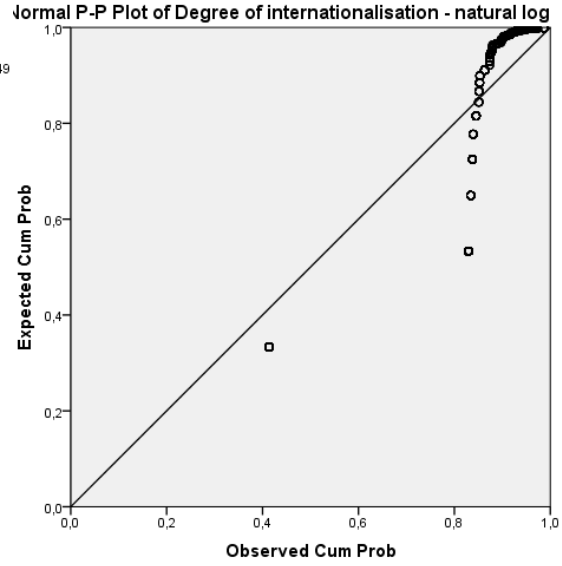


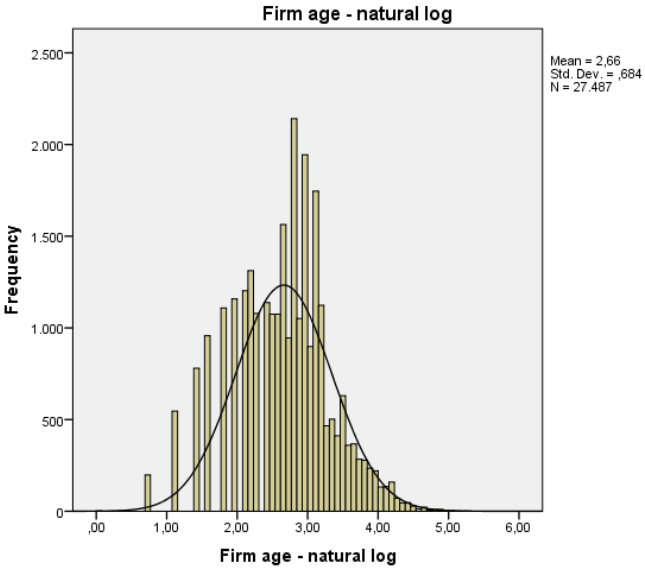
	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Innovation	.949	.016	-.501	.032
Macro voids	.591	.016	-.228	.031
Product market voids	.692	.015	-.401	.030
Managerial experience - square root	.063	.015	-.375	.030
Degree of internationalisation - natural log	2.084	.015	2.719	.030
Firm age - natural log	-.163	.015	.179	.030

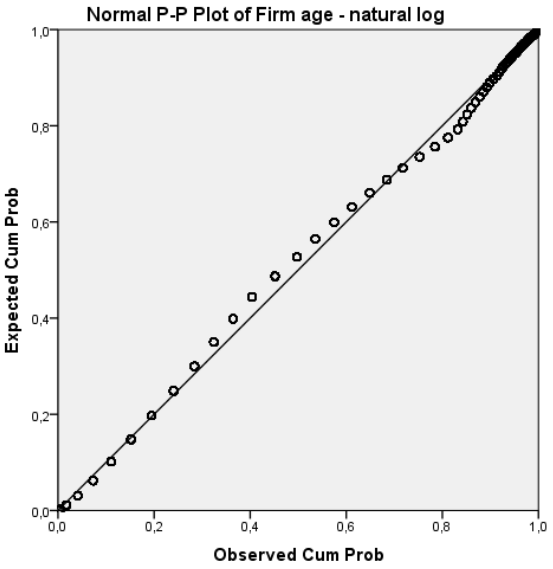




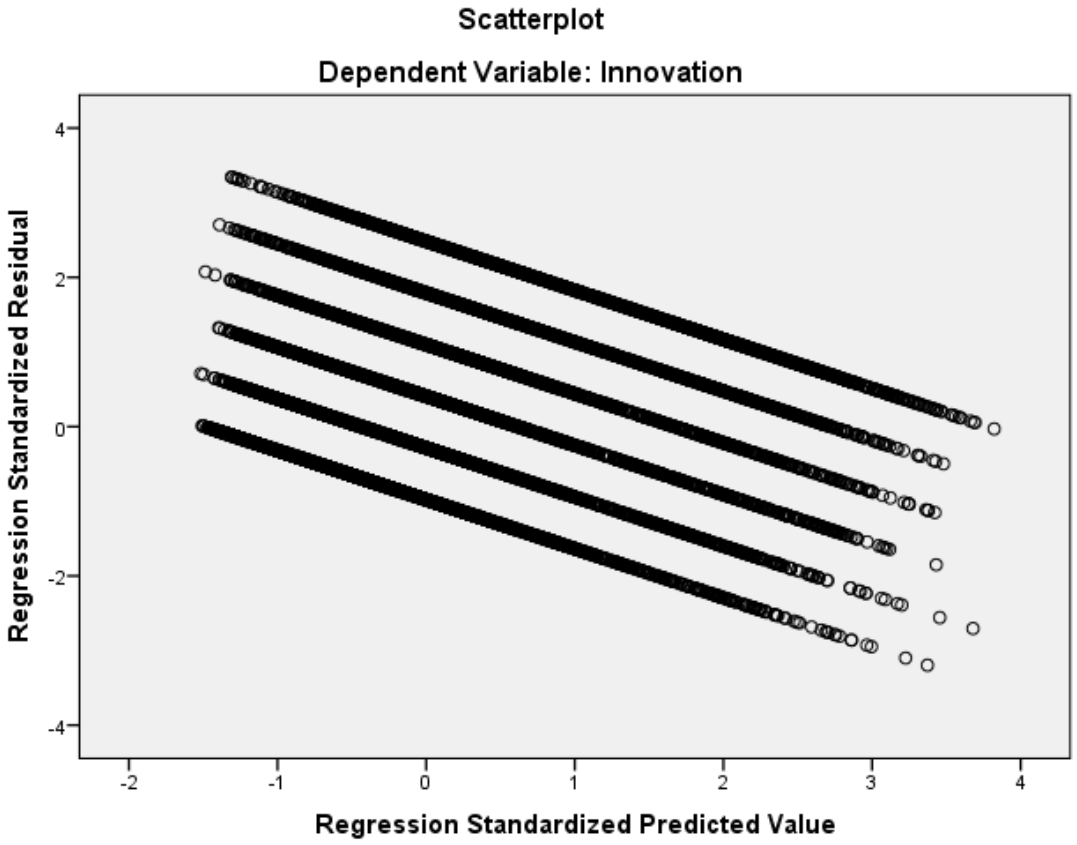

Degree of internationalisation - natural log
Mean = ,58
Std. Dev. = 1,349
N = 27.058
Frequency
Degree of internationalisation - natural log


Normal P-P Plot of Degree of internationalisation - natural log
Expected Cum Prob
Observed Cum Prob


Firm age - natural log
Mean = 2,66
Std. Dev. = ,684
N = 27.487
Frequency
Firm age - natural log


Normal P-P Plot of Firm age - natural log
Expected Cum Prob
Observed Cum Prob

Appendix L: Assumptions



Model Summary

Model	R	R Square	Adjusted R Square	R Square Change	Durbin-Watson
1	.549	.302	.301	.302	1.629

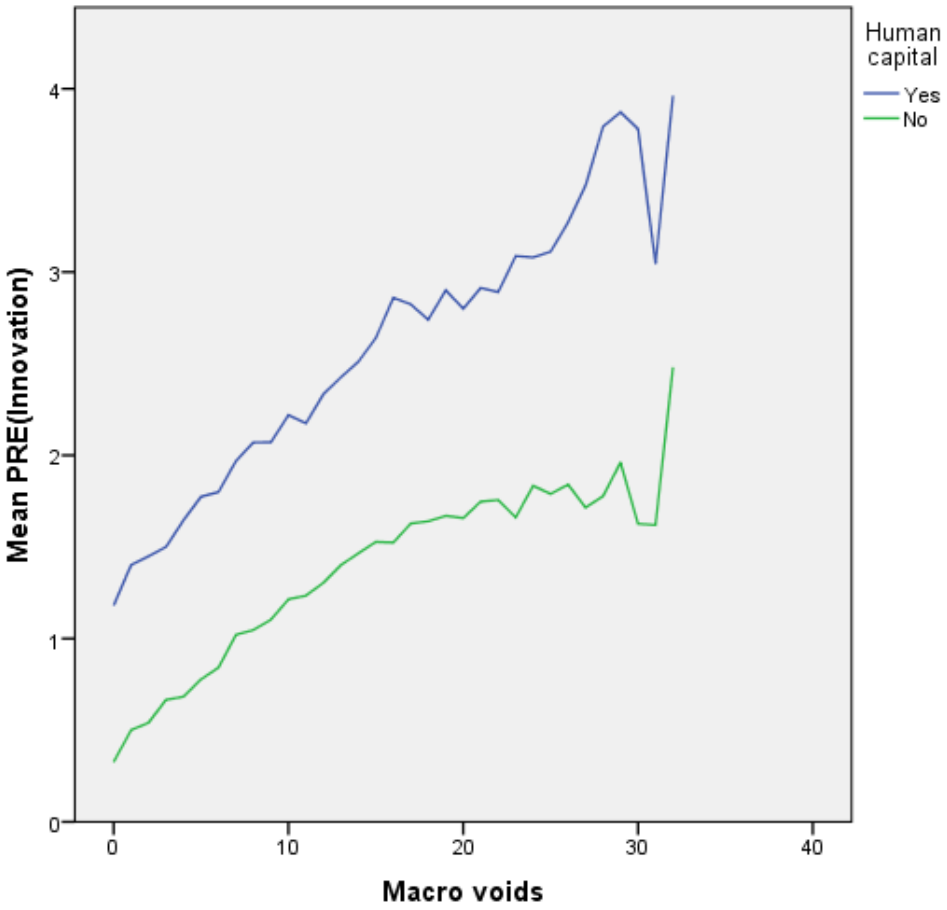
Appendix M: Results

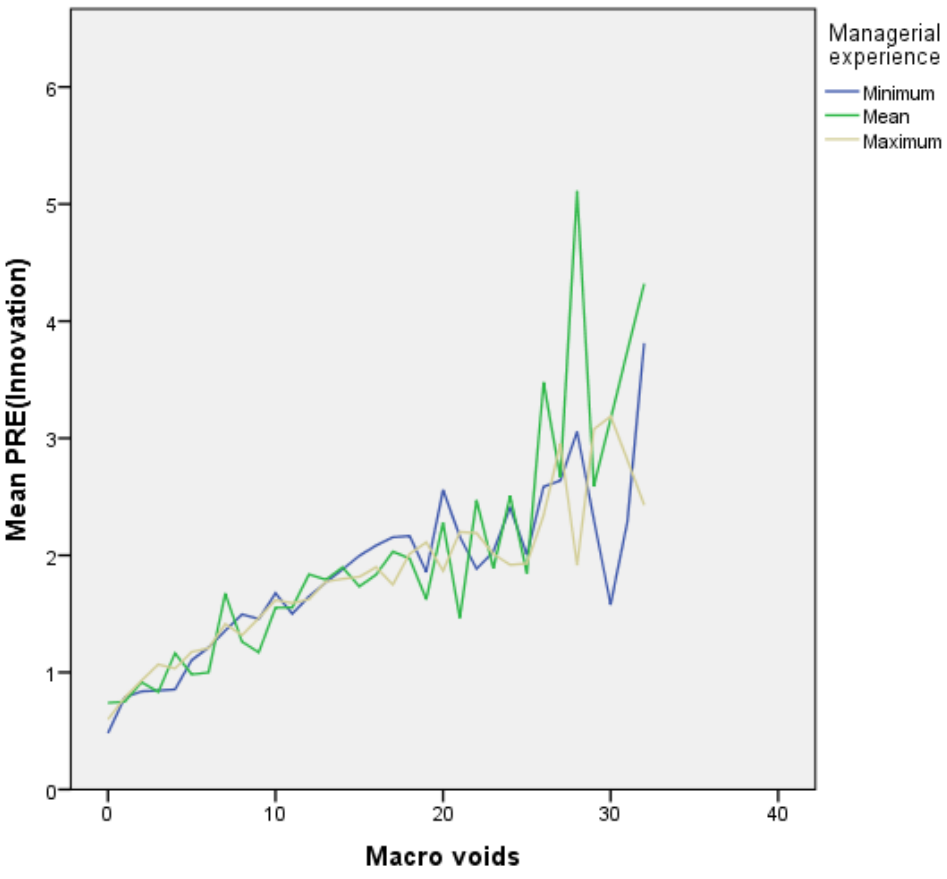
Model Summary

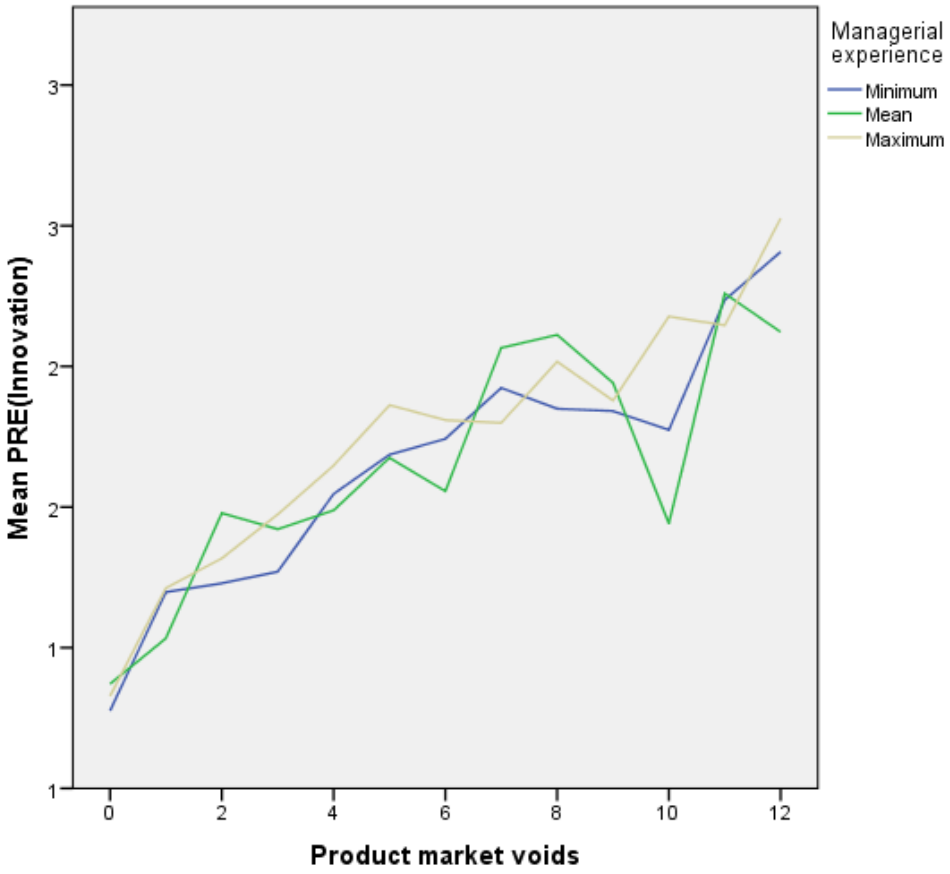
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.602	.362	.353	1.39002	.362	39.515	276	19197	.000	
2	.614	.377	.368	1.37402	.015	225.984	2	19195	.000	
3	.637	.405	.397	1.34246	.028	305.290	3	19192	.000	
4	.638	.406	.398	1.34131	.001	6.472	6	19186	.000	1.832

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21072.272	276	76.349	39.515	.000
	Residual	37091.825	19197	1.932		
	Total	58164.097	19473			
2	Regression	21925.551	278	78.869	41.776	.000
	Residual	36238.546	19195	1.888		
	Total	58164.097	19473			
3	Regression	23576.136	281	83.901	46.554	.000
	Residual	34587.961	19192	1.802		
	Total	58164.097	19473			
4	Regression	23645.995	287	82.390	45.794	.000
	Residual	34518.102	19186	1.799		
	Total	58164.097	19473			


Human capital
Yes
No
Mean PRE(Innovation)
0
1
2
3
4
0
10
20
30
40
Macro voids


Managerial experience
Minimum
Mean
Maximum
Mean PRE(Innovation)
0
1
2
3
4
5
6
0
10
20
30
40
Macro voids


Managerial experience
Minimum
Mean
Maximum
Mean PRE(Innovation)
3
3
2
2
1
1
0
2
4
6
8
10
12
Product market voids