"Peace, Easy Taxes, and a Tolerable Administration of Justice": Institutional Influences on SME Innovation in Developing Countries

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Abstract

This thesis explores the effects of "peace, easy taxes, and a tolerable administration of justice" on innovation. These three factors are necessary to protect the property rights in every country, and protecting these rights is one of the fundamental chores for the institutions. However, in developing economies, lack of these institutions or non-functioning institutions can lead to corruption, crime, and tax corruption. The main objective of this thesis is how corruption, crime, and tax corruption are affecting small and medium-sized firms' innovation in developing economies. In order to explore this relationship and analyze the different aspects of it, quantitative econometric analysis is used. The empirical analysis is based on the data from the Enterprise Surveys by the World Bank group, which contains firm-level data regarding business environments from 139 countries. Furthermore, this thesis reports the effect of a variety of factors which influence innovation in developing countries. The results show that corruption and crime in emerging economies are facilitating innovation, while tax corruption is not significantly affecting innovation in small and medium-sized firms.

Chapter 1

1.1. Introduction

Institutions are among the most salient factors affecting economic development in any country. High quality and well-functioning institutions can ease the way of economic growth (Rodrik, Subramanian & Trebbi, 2004). As a matter of fact, Adam Smith has already asserted in the mid 18th century that "Little else is requisite to carry a state to the highest degrees of opulence from the lowest barbarism, but peace, easy taxes, and a tolerable administration of justice" (1755). In modern societies and nation-states, it is a variety of institutions that can develop and implement the three elements of Smith's proposition.

Smith believed that the establishment of a legal justice system is necessary to prevent crime and protect property rights within a peaceful environment. This system should not have to be perfect, but it needs to be tolerable, Smith believed. He provided a detailed explanation about why laws are essential in protecting property rights and how securing property rights can lead the countries to development (O'Driscoll and Hoskins, 2003).

Securing property rights, hence, is the key to economic growth and national wealth (Besley, and Ghatak, 2010). Ensuring these rights requires a tolerable administration of justice which, in turn, needs to have appropriately functioning political and economic institutions. Institutions should work within the frame of laws, the laws that make taxation systems fair and straightforward, prevent crime to create peace and peaceful situation, and to avoid corruption and its growth. However, in developing countries, the juristic system is not usually designed to properly secure property rights, which can easily lead to corruption and crime. Corruption, tax corruption (including evasion), and crime will reduce innovativeness, productivity, growth, and entrepreneurship in countries. This could be a critical obstacle in the way of a country's economic growth (Claessens, and Laeven, 2003).

Furthermore, the relationship between economic development on the one hand, and corruption, tax corruption, and crime on the other hand, has largely been investigated by researchers in the

past and is still under investigation by many in different parts of the world. One strand in literature considers corruption as the "grease in the wheel of economic growth" in highly bureaucratic economies with a bad business climate and not secured property rights. In these economies, the lack of regulatory institutions and the non-functioning rule of law may not be a barrier in the way of growth. Corruption and tax corruption, in this context, can fasten and also facilitate the idea of entrepreneurship. Another strand of research, sees corruption as a "sand in the wheel of growth," regardless of the economic situation. These studies mostly focus on the destructive effects of crime, corruption and tax corruption on economic development (Leys, 1965; Leff, 1964; beck and Mahler, 1967; Huntington 1968; cited in Dreher and Gassebner, 2013).

Corrupt institutions in developing economies have a significant effect on entrepreneurship and innovation, regardless of their sand/grease effect or negative/positive impact. According to Scott (1987) who categorized institutions into three dimensions of Regulatory, Normative, and Cognitive, as different dimensions of institutions that represent different parts of relationships and characteristics of the firms within the economy. The regulatory dimension of institutions is related to the rules and structures within an institution. This organizational aspect of the institutions within a country is responsible for establishing an administration of justice and good business and economic environment for economic activities therein. The regulatory dimension of institutions consists of the government offices and public services represented by the government responsible for offering governmental goods to the public. The normative dimension is about the values, roles, and norms. The cognitive aspect deals with the symbols and identity issues within an institution (Scott, 1995). North (1996:344) defined the regulatory dimension of institutions as "formal constraints which contain rules, laws, constitutions; the normative dimension of the institutions as informal constraints which represent norms of behavior, conventions, and self-imposed codes of conduct; and the cognitive dimension as their enforcement characteristics." These three dimensions of institutions should all work harmoniously in a system to support economic growth.

In developed economies, in studies of innovation, having well designed and functioning regulatory institutions are always taken for granted since they tend to have an established rule of law. Studies in these countries mostly do not focus on primary regulatory institutions because

they already have peace, easy taxes, and a tolerable administration of justice in their systems. Majority of studies in these countries focus on the normative and cognitive aspects of the institutions. On the contrary, in developing countries, the majority of the institutions are suffering from either the lack of appropriate laws or little, if not, no abidance to the rules in institutions. In other words, in developing economies, the regulatory dimension of the institutions is not functioning well enough, which most often leads to more corruption, crime, and tax corruption. Non-competent institutions in these countries will threaten the property rights of the public, entrepreneurs, and generally, every economic unit willing to operate. Therefore, supporting property rights by the regulatory systems and legal institutions in developing countries is one of the essential requirements for economic growth and any kinds of growth, for that matter.

1.2. Statement of the Problem

The literature on small and medium-sized enterprises is mostly dominated by studies on developed countries like the United States, United Kingdom, and Western Europe, which are places that already have established peace, easy taxes and a tolerable administration of justice in their economic contexts. In these countries, the institutional concerns are mainly cognitive and normative, but not regulatory.

Studies in emerging economies, nevertheless, often underline the effect of institutional voids (Khanna and Palepu, 1997). In other words, the lack of regulatory institutions in developing countries creates an institutional void, which can be replaced by either corruption, crime, and tax corruption (Hajer, 2003), or certain kinds of (mostly illegal) social networks. Networks are social connections which emerge and develop during a period of time to substitute the roles played by the regulatory institutions. Research studies, however, indicate that these networks usually are not defined by legal systems; they will therefore, create many obstacles in the path of economic growth of countries. In comparison to well-functioning institutional systems, these networks cannot support economic development (Démurger, 2001).

This study attempts to shed more light on the relationships between securing property rights and innovation. I try to reveal how corruption, tax corruption, and crime can affect innovation and productivity within small and medium-sized firms in developing countries. Moreover, by reviewing previous literature, I will explore the effects of variables like firms' age and size, sector, socio-cultural beliefs, formal training, political instability, and region on the changing nature of corruption and crime.

In order to study and analyze the relationships mentioned earlier, I will utilize the Enterprise Survey data provided by the World Bank group. This data focuses on fundamental factors which shape various aspects of the business environment such as regulations, taxes, corruption, crime, gender, finance, infrastructure, innovation, and performance of different enterprises in developing countries. This data contains information gathered from top managers or owners of different firms in specific sectors within 139 countries. This data will give great insight into how corruption, crime, and tax evasion is affecting innovativeness and productiveness inside companies. In this research, an econometric analysis will be used via quantitative methodology and STATA statistical software.

1.3. Significance of the Problem

Entrepreneurship activities in all countries are considered as a key to economic growth; therefore, countries design their policies in a way to support entrepreneurship because they consider it as a key to economic success and growth (Shane and Venkataraman, 2000). However, high levels of failure in entrepreneurial activities lead to higher levels of failures in achieving the targeted economic growth. Innovation is one of the most significant factors that can ease the way of growth for both entrepreneurs and national economies, at large. The creativity of individuals or organizations can lead to innovation, and innovation brings core-competencies to firms. Innovation also raises the GDP of the country by increasing the amount of output achievable from a given quantity of labor and capital. Raising GDP is also crucial for the government, and that will force policymakers to pay more attention to young technological innovators (Crafts, 1996).

The challenge for success and growth for entrepreneurs is more intense in developing countries, where the laws are not adequately supporting innovation; and bureaucracy, crime, corruption, and taxation systems are all posing as obstacles in the way of innovation.
Alternatively corruption, crime, and tax corruption can have a grease effect in the wheels of economic development in developing countries. In both scenarios, the matter of corruption, crime, and tax corruption play a significant role for policymakers in developing countries. Policymakers should know the details of this relationship to design policies to support the growth process. If corruption, crime, and tax evasion are affecting the innovation within a country, policymakers and governments should try to reduce them and introduce better ways to support innovation. Otherwise, if corruption, crime, and tax corruption are actually easing the way for innovation in corrupt countries, how should the countries fight them and yet, try to not only, not harm the innovation but also boost the level of it in this process (Mauro, 1995).

Furthermore, as far as my review of the literature showed, Smith's proposition about property rights and their significant effect on economic growth was not thoroughly studied in previous literature. This theory went into the shadow of his other more well-known works such as the Wealth of Nations and the Theory of Moral Sentiments and has not been fully appreciated through its full potential. The present study will explore the original theory of Adam Smith and will investigate the significance of the three bases of economic development in developing economies. I will make an attempt to reveal the significant effect of "peace, easy taxes, and a tolerable administration of justice" on the innovativeness of small and medium-sized firms in developing countries and will show how the absence of these three elements affects innovativeness, in particular, entrepreneurship and economic development of these countries.

Furthermore, this research will try to explore and fill the gap in the literature of corruption and innovation in developing countries. By doing so, further researches will have a better understanding of the effects of corruption, crime, and tax corruption on small and medium-sized firms in developing countries. Understanding this effect could improve the quality of the research and will also make the studies of this matter more realistic.

1.4. Definition of the Keywords

One of the most critical keywords in this research is corruption, which needs to be clearly defined in this context. The most well-known and classical definition of corruption is given by Nye (1967): [corruption is] "behavior which deviates from the formal duties of a public role because of private-regarding (close family, personal, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence" (Nye, 1967: 417). In this definition, Nye points out the significant effect of laws and explains the difficulties of applying a proper administration of justice in many countries especially in those countries where personal interest is more important than the rule of law. Jacek Tarkowski gives another definition of corruption (1989, pp. 53-54), that:

"Corruption . . . is an activity motivated by interest, violating the binding rules of distribution, the application of which is within one's responsibility. Rules of distribution refer not only to the letter of the law but also to norms recognized as binding by society and to the system's 'official' norms and operational codes. Also 'corrupt' are those activities regarded by society as illegitimate or seen by the power elite as contradictory to the logic of the system".

Tarkowski uses this broad definition of corruption regardless of it being public or private, legal or illegal. Finally, Philip (2016) defined corruption as the abuse of public rules or resources by personal power and responsibilities for their own benefit. He points out that corruption should not be treated as a personal behavior or a particular action of a single individual but as a social or a systematic problem because the consequences of corruption affects everybody within the society.

Philip's definition is adopted in this study; therefore, corruption is defined as the abuse of power by a governmental official for private benefits. Corruption is an unwritten agreement between two parties, a government official and a private party, according to which the government official will promise to provide a governmental service or good, allocating public funds and grants for contracts, hiring, burying information of tax evasion or any other actions which are against the law, and the individual parties are willing to pay bribes to public officials to act in their favor. According to the nature of corruption which needs secrecy, this action is not easily traceable by other parties (Lui, 1996; Znoj, 2009).

Another keyword which seems to have a more ambiguous meaning in literature is the meaning of crime. Crime can refer to a vast number of terms, but the meaning of crime which this research will focus on is narrowed down to that of robbery, vanishing, and vandalism. Crime has been defined as "an unlawful act punishable by a state or other authority" by the Oxford English dictionary (2009). According to the definition of crime given by common law, robbery is defined as taking a property which does not belong to the person who is committing this action, by force and creating fear. The type of crime which is the primary concern of this research, is the crime which is done by individual offenders, which will cause damage to the property or workplace. This type of crime is the direct indicator of not secured property rights in the country.

Regarding the term of taxation and the corruption in this system, it is crucial to separate tax fraud, tax evasion, and tax avoidance from other kinds of corruption in the taxation system. Tax compliance has been defined as "the willingness of individuals and other taxable entities to act in accordance within the spirit as well as the letter of tax law and administration without the application of enforcement activity." (James, and Alley, 2002). However, when individuals are not willing to pay taxes, they will evade them. There are other types of tax fraud; when the taxation system is corrupt, and individuals are not able to pay taxes in a comfortable and user-friendly way, or corrupt tax officials accept bribes to lower the taxes of entities or not to convict them for their tax felonies or vice versa. Seldon (1979) named a new term called tax 'avoision' to cover the tax frauds related to areas of the tax system where the law is unclear, and tax officials could use this gap in the law to drive bribes from individuals (James and Alley, 2002). The tax corruption or fraud that is the primary focus in this research is the one that is a result of the corruption of the public officials or bad laws, not the ones initiated by private parties. For example, when officials continually ask for auditing firms in order to get bribes, or even when firms are willing to pay the right amount of taxes, but because of the corrupted system, they have to pay bribes to an official to do so. Another example of this type of tax corruption is when private parties are forced to pay bribes to officials to avoid the unpleasant and unfair taxes that are being forced by bad laws. In conclusion, tax corruptions in this research are the types of corruptions or evasions which are being caused by the corruption in the taxation system or tax officials.

Another term that is needed to be defined is innovation. "Innovation has been consistently defined as the adoption of an idea or behavior that is new to the organization" (Bon & Mustafa, 2013). Manual (2005) also defines innovation as:" the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations." The European Commission (CEC) defines innovation as "the renewal and improvements in the product itself or methods of production, process, methods of distribution and supply, services, or new ways of management and organization" (CEC, 1995). The types of innovations that we are looking for are related to service, process, or product innovations and will include both incremental and destructive innovations in small and medium-sized firms. All types of innovation that are being presented by small and medium firms in developing countries are under the coverage of this research. However, according to the nature of our data, we cannot separate different types of innovation to analyze the effect of corruption, crime, and tax corruption on different types of innovation. Therefore, in this research, all kinds of innovation will be examined under one particular category of innovation.

Small and medium-sized firms (SME) are defined as "non-subsidiary, independent firms which employ fewer than a given number of employees" (OECD, 2005). This number varies across countries. The most frequent upper limit designating an SME is 250 employees, as in the European Union. However, some countries set the limit at 200 employees, while the United States considers SMEs to include firms with fewer than 500 employees. However, the most common number of employees used in different literature to consider the firm small and medium size is 250. This research will also consider the firms whose number of employees are less than 250 as small and medium-sized firms.

1.5. Limitations

The limitation of this research is risen from two parts: the constraints driven by the available data; and the ones that I am going to consider to limit the area of the research from getting too profound in order to achieve a genuine understanding of the matter. The most salient limitation is the fact that this research is limited to investigate corruption, crime, and tax corruption in

developing countries, hence, we will not deal with any developed country. Secondly, the data utilized in this research focuses only on the information related to 'corruption, crime, tax corruption,' and their effect on innovation. Other factors related to the business environment will not be investigated. Another limitation is regarding the size of the firms. This research will investigate the data of firms whose number of employees are less than 250.

Another type of limitation is the limitation we considered when defining the keywords and limiting their scope to the issues investigated in this research. First, 'corruption' needed to be restricted because it can comprise of a vast range of actions in different contests. Corruption in this research is limited to only economic corruption. Economic corruption is the type of corruption which is done in the public sector of a country that affects the economic activities within the country (Lessig, 2013; Gardiner, 2017). Another limitation on the meaning of this term is that its scope is limited to that of public corruption. According to the definition given above, corruption is an agreement between a public official with power and authority, and a private party to use the power and authority of the public official to the private party's gains; it has a secrecy in nature, which makes it challenging to be monitored and traced by other officials or administration parties (Johnston, 2005).

The term crime also needed to be restricted to give more structure to the research. The type of the crime which is the focus of this research is the number of robberies, theft, property damages done by theft, vandalism of the property or belongings of the property, terrorism, shoplifting, and trespassing. These types of crimes are the direct results of not secured property rights and lack of peace within a country. Other types of crimes such as swearing, verbal abuse, pranks, arguments, vandalism of the people, sabotage, pushing, physical assaults, psychological trauma, anger-related incidents, rape, arson, and murder are not under investigation of this research. We also limited the meaning and definition of tax corruption to the tax frauds in the taxation system. This kind of corruption can result in bribes in dealing with government regulations, more visits to tax officials or more delays when obtaining governmental licences.

Chapter 2

Literature Review

2.1. Introduction

Institutions have a significant influence on entrepreneurship. Since; they not only provide access to research and a pool of educated labor for entrepreneurs, but they are also a critical source of financial support for these entrepreneurs (Bartholomew, 1997). Entrepreneurship literature, in addition to economic factors, recognizes institutions as one of the two major factors that affect entrepreneurship, which are economic factors and institutions (Aidis, Estrin, and Mickiewicz, 2008).

North (1993) reminds that; "institutions, composed of rules, norms of behaviors, and the way they are enforced, provide an opportunity set in an economy that determines which kind of purposive activity embodies organizations that will come into existence." Later on, Scott (1995) asserted that institutions function within the culture, structure, and routines in a specific jurisdiction system, and the formation of institutions consists of three different dimensions; regulatory, cognitive, and normative. Regulatory institutions are, therefore, one of the main elements in a country's justice system and how it operates to protect property rights. More secure property rights will increase countries' total entrepreneurship activities by improving the entrepreneurial environment.

However, higher levels of entrepreneurship do not necessarily cause growth. Baumol (1996) explored the reasons behind the high rates of failure in entrepreneurship. He also divided entrepreneurship into two groups of productive and unproductive. He admitted that institutions should reduce the percentage of unproductive entrepreneurship and restrict the government's power (Baumol, 1996). According to him, the number of productive entrepreneurships is related to how well institutions perform within a country. Later, Sobel (2008) confirmed Baumol's productive and unproductive theory and the effect of institutions on entrepreneurship and admitted that institutions affect the quality and productivity of entrepreneurship. Institutions can direct entrepreneurs' energy and resources in productive ways and can make significant impacts on entrepreneurship's success rate (Levie & Hunt, 2004).

The debate and the nature of the controversy in entrepreneurship in developing economies is different from those of the developed ones. Developing economies face more and different challenges, and their institutional structures are different. In these countries, factors such as legal systems and contract enforcement, entry regulations and entrepreneurship, and the credibility of monitory policy and economic performance function differently because of their institutional structure (Rodrik, 2008). Weingast (1995) found that in these developing economies, regulatory institutions do not exist, or most cannot perform in their ultimate performance to support entrepreneurship. When these institutions cannot perform in the way they function in developed economies, the country will not enjoy a peaceful context for entrepreneurs, easy taxes and tax systems, and a tolerable administration of justice to support property rights. Lack of the three required elements of Adam Smith's proposition will likely threaten the property rights in developing countries, and hence, will lower the economic development and welfare. Chen and Puttitanun (2005) believe that unsecured property rights will undoubtedly reduce the innovation within firms; the innovation which according to Acs and Armington (2006) is an input-completing capacity on entrepreneurial activity, which in turn is a critical factor of growth. In total, in developing countries, unsecured property rights can reduce the amount of innovation and the quality of entrepreneurship, and this fact can ultimately reduce the speed of growth and lower the economic welfare.

In the following section, I will review the literature on the elements of Adam Smith's theory of growth and their relationship to innovation explored by other researchers. Studying the literature of innovation is also required in order to identify the factors which are affecting innovation. Among the factors mentioned in Smiths' theory, peace will be explored through the literature on crime, easy taxes by reviewing the literature on tax administration, and a tolerable administration of justice will be investigated by studying corruption literature. Since corruption, crime, and tax corruption, are elements of the business environment, there is a need to talk about this matter before moving forward to those elements' literature.

2.2. Innovation

Innovation is one of the most significant factors which can boost economic development by enhancing the firms' performance (Geroski & Machin, 1992, 1993). Indeed, Chris Freeman lectured that 'not to innovate is to die' (Freeman & Soete, 1997). Academic literature on innovation pointed out the significance of distinguishing different types of innovation; not only to understand innovation and its effect on growth and productiveness, but also, to identify the determinants of innovation in different firms (Mohr, 1976; cited in Subramanian & Nilakanta, 1996). Among numerous types of innovation identified and described in the literature, two of the most common types are administrative and technological innovation (Damanpour, 1991). Technological innovations are innovations on products or processes, and administration innovations are more related to organizational structures and administration processes (Knight, 1967; Kimberly & Evanisko, 1981; cited in Damanpour, 2010). Apart from technological and administration innovation, literature has also grouped innovation into two types of radical and incremental (Green, Gavin, & Aiman-Smith, 1995). Tushman and Romanelli (1985) described incremental innovations as changes in the current status and radical innovations as changes "wherein patterns of consistency are fundamentally reordered" (p. 174). Radical innovations mostly consist of innovations on a new product, market, or industry (Meyer, Brooks, & Goes, 1990; cited in Koberg, Detienne, & Heppard, 2003). However, incremental innovations or lower order innovations are usually small changes in existing patterns, procedures, structures, products, or services without changing it entirely.

Factors affecting innovation have been investigated by numerous researches. Literature divides these factors into four different groups, individual factors (Kimberly and Evanisko, 1981; Amabile, 1988; cited in Lin and Ho, 2008), technological factors (Teece, 1996; Chau and Tam, 1997), organizational factors (Kimberly and Evanisko, 1981; Amabile, 1988; cited in Lin and Ho, 2008), and environmental factors (Tornatzky and Fleischer, 1990; cited in Oliveira & Martins, 2011; Damanpour, 1991).

Among environmental factors, studies emphasize the effect of regions on the innovativeness of firms (Almus, 2002; Mendonca et al., 2004). The resource-munificence and regional

competitiveness theories explain that places with higher resources like developed areas are more innovative in comparison to not developed ones (Hackett and Dilts, 2008).

Sector, is also one of the factors that can affect innovation. Brouwer and Kleinknecht (1999) found that certain branches of industries such as high-tech manufacturing sectors require more innovation than other sectors. Some industries such as food, tobacco, and metal industries have lower levels of innovation, which are mostly incremental (Arundel and Kabla, 1998).

The relationship between size, age, and innovation have been long studied. Many studies confirm Schumpeterians' hypothesis which debated that the positive advantage of large firms to smaller ones in innovation are that large firms have more resources available to invest in R&D and they even have better access to skilled workers (Audretsch & Acs, 1991; Bhattacharya and Bloch, 2004). However, Kohn and Scott (1982) argued that having access to more resources doesn't necessarily lead to innovation. They discussed the benefit of being small would lower bureaucracy and increase dynamic structures which could lead to more innovation in these firms. Tether (1998) argued that the value of innovation is relatively higher in larger firms. However, Nelson (1993) cited lots of high-value innovations that were generated in small and medium-size firms. In total, regardless of the type of relationship, all studies mentioned the significant effect of the size of the firm on innovation.

Life-cycle theories discuss the effect of firms' age and innovation based on the fact that firms experience different levels of innovation in different stages of their life-cycle. Davidson and Delmar (1997), found that younger firms are more likely to grow than large firms and this can result in higher innovation levels. Calvo (2006) showed that younger firms are more likely to experience employment growth than older ones but this relationship doesn't stand when they're dealing with the adoption of new technologies and, in total, innovation is not affected by the age of the firm (Acs and Audretsch, 1988; Bhattacharya and Bloch, 2004).

In studies about the effect of firms' characteristics on innovation, another important term mentioned by literature is training. Increasing focus of literature on the importance of developing human capital in organizations, encouraged studies to develop a body of literature about training practices and various performance measures (Tharenou, Saks, & Moore, 2007). Offering training programs by firms will create an opportunity for learning, and a climate of improvement which

will increase knowledge and result in more sophisticated ideas among employees, and this learning environment, can increase the innovativeness of individual employees within the firm and eventually, can generate more innovation for the firm (Lau & Ngo, 2004).

Other internal factors related to human capital, such as the number of skilled workers in the firm and the top managers' experience can also affect innovation. Skilled workers can increase the quality of human capital in firms, and higher quality of human capital can result in higher work-place innovation (Koeller, 1995). The importance of the effect of experience of top managers on innovation has been discussed since early literature (Hayes and Abernathy, 1980; Miller, 1987; Hayes et al., 1988; and Porter, 1990; cited in Daellenbach, McCarthy, & Schoenecker, 1999). When managers are experienced, they can support all divisions of their firms better, and as a result, the firm will have better strategic planning, individual and divisional support from their managers in order to be more innovative (Kelley and Lee, 2010).

Literature also emphasises the effect of external factors on innovation. Damanpour (1991), reported a positive association between external communication and the amount of innovation within the firm. The source of this external communication could be from outside the firm and even from other countries. Resource availability is also another significant factor in firm-level innovation (Cohen and Levinthal, 1990; Damanpour, 1991). Foreign investors can bring knowledge such as technology and financial resources to the firms, and in total, this can lead firms to innovate more. For instance, recently, Turkey has started to attract an increasing amount of foreign direct investment (FDI). This not only increased the available financial resources for companies, but also enhanced the quality of human resources for the firms and both of these factors can encourage firms to be more innovative (Gumusluoğlu, and Ilsev, 2009).

However, attracting foreign direct investment is not possible without having good political relationships and in total, a stable political condition. The effects of political risk and political instability are even more significant, especially in developing economies where foreign direct investment in these economies increased from US$100 billion in 2000 to US$350 billion in 2008 (UNCTAD, 2009). Busenitz et al. (2000) explained that when a country is politically stable, innovation can thrive in that economy. In contrast, when countries are politically unstable, the uncertainty of foreign investors will prevent them from investing in the firms within the country

(Feng, 2005). An excellent structured economic system that boosts innovation requires government legislation that supports an institutional and organizational environment that is conducive to innovation in a modern market economy (Audretsch and Thurik, 2001).

2.3. Uncertainty

This research is aiming to get a better understanding of how the three elements of corruption, crime, and tax corruption are affecting innovation. Since these three items are affecting the business environment of the country, understanding the nature of the business environment could help our research in many ways. In organizational literature, the environment has been categorized into three dimensions; munificence, complexity, and dynamism (Dess and Beard, 1984; cited in Freel, 2005). The munificence dimension shows how firms are independent of the environmental resources as complexity and dynamism show the degree of uncertainty that the firm faces.

In countries where institutions are corrupted, and property rights are not fully protected, this will make firms and entrepreneurs uncertain about the future. This uncertainty will affect the innovativeness within the country (Abernathy & Rosenbloom 1969; cited in Boudreau et al., 2011). Uncertainty shapes innovation and strategies to innovate in many ways (Boudreau, Lacetera, & Lakhani, 2011). Uncertainty is the inability to predict the nature of the effect of a future state of the environment on the organization. Buchko (1994, p. 411) wrote, "Response uncertainty is an inability to predict the likely consequences of a response choice. The third type, state uncertainty, is also referred to as perceived environmental uncertainty" (cited in Freel, 2014).

The uncertainty topic is addressed by different scholars since it's a well-known fact that the managers' opinion about the business environment is more important than how the actual business environment is (Miller, 1988). If managers are considering that the business environment is uncertain, they will be discouraged from investing in innovation, and in total, this uncertainty will affect their activities, decisions, and planes. This uncertainty can be rise from adverse business environments. However, in some cases, where the business environments aren’t

necessarily bad, the managers perception of it is not excellent either. In total, uncertainty arises from the perception of managers about the business environment, not the actual business environment.

This research will investigate the effect of perceived bad business environment on innovation. Corruption, crime, and tax corruption in this research is the idea of these items in the top managers and firm owners. According to debates in the topic of uncertainty, the real business environment is not affecting the firms' innovation itself, but the firms' perception about how corrupt the administration and the taxation system is, will affect their actions, planes, behavior, and characteristics such as innovativeness. Although many can argue that it is the actual business environment which is shaping the managers' perception of the business environment, however, in this research, we are going to focus on the perception of the business environment from managers' point of view. The effect of the actual environment on this perception is not in the interest of this research.

2.4. Corruption

The Public-Sector theory explains that the benefit that special groups of people or officials receive from particular governmental actions, rules or goods can reduce the total well-being of the country by lowering efficiency (Stigler, 1971). If corruption is defined as an agreement between two parties while having benefits for both sides, then the benefits that special groups gain is one of many forms of corruption, because, either preference in the allocation of resources is given to a party (Macrae, 1982, Bardhan, 1997) or power is abused, in one form or another, for personal goals (Rodriguez et al., 2006).

Corruption is a reflection of how effective a country's legal, political, and cultural institutions are working. Carothers (1998) and Nwabuzor (2005), among others, emphasize the significant role of the legal institutions of a country in corruption. In some countries, there are advantageous rules, however, they are not implemented correctly. These un-functioning rules and procedures might lead to corruption. In some other countries, an effective judiciary system does not exist to support the process of growth. Laws and complications, therein, create bureaucratic procedures

which lower the paces of development and growth or even hinders the innovative companies' growth. For instance; when an entrepreneur wants to start a business or launch an innovative idea, these bad rules and barriers will prevent or lower the speed of the process entirely. Unfortunately, in these situations, officials may speed up this process or rewind the destructive laws by acquiring bribes from business owners. Sometimes it's even possible that the corrupt private or public entities or individuals come up with better procedures for a process through corruption than what policymakers suggested through the law (Bailey, 1966; cited in Méon, & Sekkat, 2005).

Some countries may have established sound judiciary systems but can still suffer from corruption because, neither officials nor entrepreneurs and innovators obey the established rules. For example, when a country has excellent resource allocation policies, a few entrepreneurs will still bribe the people in charge to have access to better or more resources. The officials can also accept bribes in situations where they have low incomes or the economy is unstable, and furthermore, when their moral beliefs is not preventing them from getting bribes. In this scenario, the official will provide the permit or resource to the party with the highest bribe amount while that company might not be the most competent one (Djankov et al., 2003).

2.4.1. Empirical Examples of Corruption

A closer look into two data sets, namely A) Word Rule of Law Index (which ranks countries based on their rule of law according to the experiences of general public and in-country experts) and B) the World Transparency International (which ranks countries based on the perceived corruption reported by business owners and experts), we can explore the effects of good or bad judiciary systems on the prevalence or rarity of corruption in different countries. Afghanistan and Venezuela ranked among the worst countries in the World Rule of Law Index. They were also ranked 172nd and 168th country in the corruption index, which means that they have a bad rule of law and are also highly corrupted. However, Turkey and Uganda have a close ranking in the World Rule of Law Index, but Turkey is ranked 78th and Uganda 150th in the corruption index. In these two countries, the quality of the rule of law is similar, but Uganda is twice as corrupted as Turkey because of their bad implementations of the law, not the lack of it. These comparisons

reveal the fact that laws and the judicial system are not the only variables that can affect the country's corruption level.

2.4.2 Causes of Corruption

Researchers have suggested several causes for corruption; from economic isolation, colonial past, internal bureaucracy control, centralized decision making, weak democratic institutions (Lambsdoff, 1999), and to the lack of freedom of the press (Chang and golden, 2004). The level of income and welfare is also associated with corruption (VanRijckegham &Weder, 2002). One study in Uganda, for instance, reported that the percentage of graft received by corrupted officials contains 87% of their salary (Reinikka and Svensson, 2004). The negative relationship between corruption and the level of income is also supported by other resources such as Brown and Cloke (2006), Kunikova and Rose-Ackerman (2005), Lederman, et al. (2005), and Chang and Golden (2004). All these studies concluded that the levels of corruption could be mostly explained by the level of income and economic factors of the nation.

The level and nature of corruption in different countries with a similar economic situation may vary. Sequeira and Djankov (2010) found that in South Africa, there was a strong relationship between corruption and income while this relationship tended to be less intense in other developing countries. A study by Shabbir and Anwar (2008) using comparative analysis from 41 developing countries explained the reason behind this variation. They reported that 64% of variations in different countries corruption levels are explained by economic factors like economic freedom, globalization, level of development, and income. 13% of the variation is explained by non-economic factors such as press freedom, income inequality, religion, and democracy. The remaining 23% is related to the factors that they did not examine. Treisman, (2000) also concludes that factors affecting the level of corruption within a country may consist of several variables such as income, jurisdiction system, bureaucracy, press-freedom, religion, economic development, democracy, freedom, openness to trade, and globalization.

2.4.3. Motivations for Corruption

Discovering and acknowledging the motivations for corruption may be an essential factor to find any solutions to prevent or individually avoid it. Although it may have some cultural biases, it is mostly related to the corrupted person's decision to commit illegal actions. When an official has a desire for doing the right thing or preventing bad things from happening, it could trigger corruption (Rose-Ackerman, 1999). This decision is usually shaped by numerous factors in tandem. According to Acemoglu & Johnson (2005), the role of law and property rights in countries with higher levels of corruption are different and have a significant effect on entrepreneurship. Laws often have an ambiguous impact on corruption. In countries with lower law abiders, the decisions in situations where there does not exist any specific laws, the decisions being made by public officials can bring up more opportunities for corruption. On the other hand, when the role of law is too bold in some situations, this can create such bureaucratic procedures in public systems that can result in different, possibly corrupt consequences. In total, higher levels of regulations can prevent the officials from corruption in some countries, but in other countries, entrepreneurs see these regulations and bureaucracies as an obstacle or hinder in the way of their success; therefore, they turn to corruption (Scott, 1995).

2.4.4. “Grease” or “Sand” Effect

Leff (1964) and Bailey (1966) consider corruption only as a reflection of the countries' bad policies. They find corruption as a positive and beneficial factor for supporting innovation in countries with bad policies (cited in Méon, and Sekkat (2005). Corruption can also boost investments in countries with higher political risk, because it gives private parties more confidence and reassurance that they will be able to get their desired permits, legally or otherwise. Lambsdorff (2003) believes that in these countries, corruption will increase the planning of innovative activities by keeping away different unpleasant side effects or blockages caused by political or economic hardship. Although to avoid the negative impacts of corruption, it would have been ideal if private parties or officials could find a solution or a different way to revise the policies that they perceive as unfavorable, the effect of corruption on innovation is

binaural. The existence of corruption and the absence of the rule of law can both discourage innovators and help them to ease or fasten the process of getting permits.

Spiller (1990), too, asserts that corruption can be considered as a practical action which can enhance the growth rate and total entrepreneurship, especially in developing countries with bad business climates and inefficient laws. Similarly, Qian and Xu (1998) show the severe destructive consequences of rejecting and delaying innovation projects because of bureaucratic systems in some developing countries with higher regulatory systems. In these situations, the corrupted officials may be able to speed up the innovation processes by receiving bribes and skipping the bureaucracy entirely. This activity is called "greasing the wheels" in corruption literature. Dreher and Gassebner (2013) also admitted that according to their research, corruption could have positive effects in highly regulated countries. "Grease the wheels" theory is rooted in the early works of research on corruption (e.g., Leys, 1965; Leff,1964; Beck and Mahler, 1967; Huntington 1968 cited in Dreher, and Gassebner, 2013). Nye (1967, cited in Dreher, and Gassebner, 2013) explains that corruption can help newly entered entrepreneurs to overcome the barrier of higher prior investments needed in some fields by giving much lower amounts to the officials as a bribe. Van Rijckeghem and Weder (2001) also argue that corruption can increase the efficiency of the public sector by increasing the officials' income and making administrative jobs more attractive to more sophisticated candidates. He further argues that when an officer is trying to bypass a non-functional law or slow process, there is a possibility of ending up with a better and more efficient operation. Moreover, Leff (1964, cited in Svensson, 2005) claims that corruption can increase the quality of investment. There is a possibility of better allocation of resources by giving the licenses to companies with higher resources who can bribe more and probably are more qualified and capable.

Of course, there is another strand of research with reliable evidence against corruption, which believes that corruption does not have a wholly positive influence on entrepreneurship and innovation activities. Corruption is arbitrary (Rodriguez et al., 2006), meaning the expenses of corruption are not fixed and not predictable. Estrin, Korosteleva, & Mickiewicz (2013) mentioned that entrepreneurs need to plan for their future based on a non-written argument with a hope that the second party who could be a public official, will do what they agreed to do with no guarantees. This fact will affect the total entrepreneurship negatively by preventing

entrepreneurs from being able to plan for their activities. On the other hand, one argument supporting the "greasing the wheels" theory was that corruption could fasten the slow processes of getting permits, but this is undermined by another fact that officials can delay these processes themselves to acquire more bribes. Another argument in support of the "greasing the wheels" theory was that through corruption, the permits and licenses would be given to the firms with higher money offered and these firms could be the most competent firms. However, Rose-Ackerman (1997) pointed out that this argument is not necessarily correct because firms can pay more bribes just by simply risking more of their assets or by producing lower quality goods. Furthermore, corruption will decrease the expected probability of investment for entrepreneurs, and this will affect their plans regarding new businesses and new entrepreneurship activities and total innovation (Estrin, Korosteleva, & Mickiewicz, 2013). Corruption also harms countries' human capital. In corrupted societies, talented and skilled people are motivated to earn money through corruption, and this will more likely reduce labor efficiency (Murphy, Sheliefer, and Vishny, 1991). Kurer also admits that corrupted public officials can commit more crimes in the process of covering their illegal money; this will also lower the country's total efficiency (1993). Corruption has a different and adverse effect on countries' administration, such as loss of trust in democracy and leaders or even the government (Tanzi and Davoodi, 1997). Corruption can dramatically affect the strategies of entry for entrepreneurs, as well (Rodriguez et al., 2006). Firms which want to enter a new corrupt market will be entering unknown territory with high costs of corruption. This will negatively affect the number of firms entering the market and will reduce their chance of survival because of restricting their financial budget. Corruption can also affect foreign direct investments (FDI) within a country (Al-Sadig, 2009). Foreign investment is usually affected by factors such as quality of institutions, lack of competition, and cultural values (Davoodi, 2000). Since the quality of institutions in host corrupted countries is low, the amount of foreign direct investment in these counties is also small. Lower FDI will also impact the countries innovativeness (Cheung, & Ping, 2004).

2.4.5. Corruption and Innovation

Corruption will reduce investments in innovation because of its higher transaction costs (Teece, 1981). In corrupt countries where the role of law is not significant and could be altered by any official, it is risky for entrepreneurs to rely on legal contractors or institutions based on trust, which is needed to support entrepreneurship and innovation. Furthermore, the nature of corruption itself violates the foundations of trust in officials and institutions (Baker et al., 2005). The three functions of trust are affection, kinship and ethnical identity which are economically inferior since it's highly risky for entrepreneurs to trust contractors based on these three functions, which ultimately will reduce the pool of providers and increase the risk of entrepreneurship and innovation (Alchian and Woodword, 1998). Trust can be non-reciprocal and is based on reputation and other signs of reliability, which are gained through multiple interactions among entrepreneurs and institutions. Entrepreneurs various experiences with institutions show them whether they can trust them to pay bribes or form personal connections in order to get the service that they want. This will conclude that institutional trust is the foundation where the interpersonal trust can grow (Rose-Achermann, 2001).

When institutions are corrupt, and entrepreneurs can't be sure that in the matter of conflicts, if their rights will be protected by the law or not, the only option left is to build a relationship with the officials and count on them based on a one-sided trust; the entrepreneurs should trust officials based on a non-written agreement (Alchian and Woodword, 1998). This partial trust is sufficient to motivate entrepreneurs in non-corrupt countries (because of transparent laws and official recording of every agreement), but not in corrupt ones where the officials are bribed, therefore, they try to cover all transactions and communications with entrepreneurs (Rose-Achermann, 2001). Even when firms want to do incremental innovation in a corrupt country, the lack of trust will reduce the innovation's success rate and may lead to two scenarios: firms avoid incremental innovations altogether or try to build a long-term relationship with corrupt officials. However, because of the nature of secrecy of corruption, private parties cannot trust the officials in any way for long-term activities.

Corruption reduces the private party's resources and their trust in institutions as well. Limited resources will reduce private parties' investments in innovation. Murphy, Sheliefer, and Vishny

(1991) revealed that when firms want to keep their innovative advantage, speed is a key element for innovative firms (cited in Anokhin, and Schulze, 2009). However, in developing countries with a mostly bureaucratic structure, the lengthy processes can lead the firms to lose their advantages. Therefore, they will not be eager to invest in innovation at all. Dutta and Sobel (2016) show that in total, considering the benefits of corruption in "greasing the wheels" theory which can make the entrepreneurship process easier, corruption is bad for all countries, even in lousy business climate countries. Habiyaremye and Raymond (2013) also concluded that corruption has a negative effect on innovation and entrepreneurship. Control of corruption not only will increase the economic welfare, foreign direct investments, and productivity, but will also result in capital growth in GDP and income for all workers by fastening the economic developments (Kaufman, Kraay, & Mastruzzi, 2003). Control of corruption will also increase the United Nations Human Welfare Index Rate (Rose-Ackerman, 2004). It will also reduce inequalities in peoples' income (Carmingnani, 2005).

However, a study using the Global Entrepreneurship Monitor data shows that corruption has a negative effect on entrepreneurship, but when they removed the developed countries from the data, the results changed and showed a positive impact of corruption on entrepreneurship (Aidis, Estrin, & Mickiewicz, 2012). This means that the negative effect of corruption on entrepreneurship and innovation is severe in developed countries, but in developing countries, corruption can help innovation and entrepreneurship. This research concluded the need for further investigation of the relationship between corruption and entrepreneurship. Similarly, another research by Anokhin and Schulze (2009) also highlighted the need for research in the relationship between innovation and corruption.

2.5. Tax Corruption and Innovation

In most developing countries with a bad business climate where non-functional laws can lead to corruption, sometimes, rules in taxation systems could be barriers to innovation and entrepreneurship for companies as well. The Organization for Economic Co-operation and Development (OECD) (1999) however, reported that in order to promote entrepreneurship, countries need to strengthen their tax and financial market policies to build a better business

climate. Governments are responsible for supporting innovation for the public good, and through the establishment of a reliable taxation system, they should try to prevent market failure resulting from under-investment in innovation in order to grow (classically see; Nelson, 1959, Nerlove & Arrow, 1962).

OECD (1999) reported that the economy within a country could be strengthened by promoting the structure of the tax system, entrepreneurial climate, and institutional efficiency, which can enhance growth within a country. Djankov et al., (2010) asserts that tax policies can have a significant role in entrepreneurship growth, because, not only can they affect the decision of the entrepreneur to enter a market, they can also affect the amount of investment and growth rates. The effect of tax policies on entrepreneurship can be looked at in two ways. First logical; tax policies can make entrepreneurs plan with more savings and investments. The second way is related to the consequences of these policies in future entrepreneurship perception and entrepreneurship entry (Gentry and Hubbard, 2000).

Numerous studies have explained how bad tax policies can affect entrepreneurship activities and growth (ex. Robson, 1998; Bruce, 2000; Schurtze, 2000). For instance, Bruce and Mohsin (2006) by analyzing the data from Internal Revenue Services in the United States, showed that high taxes were affecting the lower income corporates more than high-income corporates. However, Blau (1987) believed that higher income tax rates could lead to higher self-employment and entrepreneurship. This asymmetric effect of taxes on entrepreneurship makes the findings in literature ambiguous (Cullen and Gordon, 2002). Domar and Musgrave (1944 cited in Slemrod and Yitzhaki, 2002) argue that high taxes can make risky projects more attractive to some entrepreneurs by sharing the risk with the government. They argue that the choice of an individual to start an entrepreneurial activity depends on the possibilities of losses and gains from the project. They categorized the proportion of losses to gains into three groups. The first group are the entrepreneurs whose loses cannot be offset; in their case, the higher taxes can only worsen the loses. The second group are the ones with a possible offset of the lose. For example, imagine an entrepreneur has an income of $100, and the income tax is 20%, his after-tax income is equal to $80. However, if he takes on a risky project with a worth of $10 and loses, his income is equal to 90$, and his after-tax income is $72. The difference between the two scenarios of taking or not taking the risky project is $8, although the amount of loss in the project was $10.

This $2 lower loss is the share of government in the loss of the entrepreneur, and this fact makes the risky investments more attractive for entrepreneurs with high tax rates. The third group in Domar and Musgrave's categories are the individuals whose gains from projects are more than their losses. In their case, higher taxes can discourage entrepreneurship. As a result, lower personal taxes discourage self-employment and entrepreneurship for risk-taking individuals by discouraging individuals who wanted to save their money from tax by going into new businesses.

The effect of taxes on different types of investments is also substantial. Statistical analysis from 72 countries from the AEI International Tax Database shows that higher statutory taxes have no significant effect on investment within a country, however, they're highly effective on foreign direct investments in the country (Djankov et al. 2010). These investments are also related to investments in innovation. Developing countries with an unfair taxing system will receive less foreign investment, which in turn may lead to lesser innovation and may damage the economic situation of countries (Kaye, 2014).

Evidently, the existence of tax fraud, not only in developing countries, but also in most developed countries in the world cannot be denied and explained by the level of enforcement and tax rates. Elffers (1991) explained that tax fraud could not be entirely explained by the level of enforcement and tax rates. The enforcement of the taxing system can determine the level of risk a person can take to either cheat or not. These kinds of decisions are usually affected by social norms and institutions in a country as well.

For a long time, policymakers tended to reduce tax fraud by setting severe penalties for individuals who cheated. Although taxation is enforced by law, there is a moral and social dimension to the puzzle of tax compliance. This moral and social compliance of people make them pay their taxes on time and correctly, regardless of being audited or having any penalties present in the taxing system. However, Erard and Feinstein (1994) found that without these compliances and with more onerous regulations and enforcement, we observe more evasions in some countries. Shreds of evidence from countries with similar fiscal and taxation system but different tax evasion rates are a perfect example of the role of moral sentiments (Torgler, 2007). Violating these moral and social norms can have different consequences other than external legal

sanctions. They can arouse guilt and remorse, or they can call social relations like gossip and ostracism. The relationship between these social norms and laws is reciprocal. Social norms are a substitute and supplement of laws, and in other words, these laws can affect the social patterns in time (Polinsky and Shavell, 2000).

The number of people's contributions to the taxing system may be related to their perception of the political institutions. If they observed that these institutions are in favor of public interest, they will identify themselves with them and will be more willing to cooperate; not only with the institution, but also with the state (Bird et al., 2006). On the other side of the coin, some institutions lack accountability, and they do not spend tax money in proper ways to help the country to grow (Freidman et al., 2000).

In developing countries, when corruption is systemic among the political elite, administration staff, and governmental officials, institutions become unstable. Unstable institutions will encourage people to participate in normal economic activities, but they will try to avoid taxes by working in the shadow economy because the government and the institutions lack accountability and also, the tax burden is not being spent well in the country (Freidman et al., 2000). Dreher and Schneider (2010) observed that the correlation between the shadow economy and corruption is positive in developing countries.

Concluding, as shown above, my review of the literature shows there are a large number of studies about corruption and tax corruption and their influence on economic growth, however, to the best of my knowledge, the relationship among corruption, crime and tax corruption and innovation has not been thoroughly studied yet. Although Veracierto (2008) looked into the relationship between corruption and innovation by using longitudinal data from 64 countries, he concluded that the relationship between corruption and innovation and entrepreneurship is significant, however, in some cases, very ambiguous and in need of further investigation. Also, another paper investigating the "greasing the wheels" theory, proposed that the relationship between innovation and corruption is profoundly affected by the type of innovation. It was found that product and organizational innovation tend to decrease by higher levels of corruption, but processes and marketing innovations increase by higher corruption (Mahagaonkar, 2008).

2.6. Crime and Innovation

The literature of crime which is of interest in this research, is minimal. As mentioned in Chapter 1, in this research, we consider theft, vandalism, and any harm to the actual property of the firms as a crime. This type of crime is mostly a result of not secured property rights in the country. Makse and Volden (2011) showed that theft could affect innovation in the firm negatively. Robbery happens when there is a "criminal opportunity," and this opportunity can be a result of not secured property rights (Ekblom 2011). High amounts of vandalism and theft can affect the firm's financial assets. Lower financial assets can negatively affect the budget for innovation (Landry, Amara, & Lamari, 2002).

Looking at the body of the literature on the effect of theft and innovation, the lack of adequate literature in this matter reveals a gap in the literature of this type of crime in the business context. This research, by doing a quantitative analysis on the effect of losses, theft, and vandalism on small and medium-sized firms in developing economies, attempts to give a better understanding of this phenomena and fill the gap in the literature.

2.7. Summary

This research attempts to get a better understanding of Adam Smith's theory, the need for securing property rights in order to reach growth. Studying literature of innovation, corruption, crime, and tax corruption gave a better insight into each of these topics. A better understanding of how the literature explains the interaction of these factors will direct this quantitative analysis. I will try to show how peace, easy taxes, and a tolerable administration of justice, or by using opposite terms, corruption, crime, and tax corruption can affect innovation and entrepreneurship in developing countries. Is corruption, crime and tax corruption “grease” or “sand” in the wheel of the economy in developing countries?

Chapter 3

Methodology

As described in Chapter 1, this study aims to demonstrate a better understanding of how peace, easy taxes, and a tolerable administration of justice are affecting innovation in the small and medium-sized firms in developing economies. The purpose of this chapter is to describe the methodology used for conducting data for this quantitative research. Understanding and explaining the methods and the origin of the data will give us a better overview of the meaning of the further analysis of data. This chapter will follow an introduction to methods, research design, stratifications, sample size, instruments, data collection, and summary.

3.1. Introduction to methods

Collecting data about corruption, crime, and tax corruption alongside innovation and entrepreneurship is a difficult job to do. Fortunately, the Enterprise Survey provides suitable data in this respect. The data is firm-level, and focuses on the factors affecting the business environment. The business environment can encourage individuals to entrepreneurial activities, and it can encourage firms to operate efficiently. A pleasant business environment can hasten the process of innovation and encourage firms to work more productive, and ultimately, it can lead to sustainable development (Klapper, Lewin, and Delgado, 2011). By looking at the other side of the coin, bad business environment will lower productivity and innovation, and this will prevent the country from reaching its potential in production, growth, employment, and welfare.

The Enterprise Survey is a firm-level survey gathered from a specific group of people to evaluate the country's business environment. This survey covers a wide range of topics which represent the business environment of the country, such as access to finance, corruption, infrastructure, crime, competition, innovation and technology, and other performance measures. This data contains a vast array of economic data on 135,000 firms from 139 countries around the world.

The World Bank group started gathering this firm-level survey since 1990 in a select few counties. However, this data was not centralized until 2005-6 when the Enterprise Analysis Unit launched in the World Bank group to gather all the data from different countries and added a few questions to make all the data from different countries desirable. All the data, including raw

datasets for countries, datasets for each county in each year, panel datasets, and all relevant survey questions and documents are open to public access.

The Enterprise Surveys conducts a variety of qualitative and quantitative information from firm managers and owners. The population of this survey is chosen in a way to represent all small, medium, and large companies who are active in manufacturing, service, transportation, and construction sectors. Public sector, administrative services, healthcare, and financial services are not included in the population. The questionnaire used to conduct the survey is based on the Global methodology in 2006. The data are grouped by country and region. The regions are Eastern Europe and Central Asia, Latin America and the Caribbean, East Asia and Pacific, South Asia, Africa, the Middle East, and North Africa.

The areas covered throughout the questions are designed in a way to brighten the business environment of the country. These topics are regulation and taxes, corruption, crime, informality, gender, finance, infrastructure, innovation and technology, trade, workforce, firm characteristics, the most significant obstacles, and performance. The infrastructure, informality, gender, trade, workforce, and finance will give this research an excellent overview of the characteristics of the firms in this data. Also, it will help the analysis by controlling the possible variables that can affect significant relationships. The questions in topics such as corruption, regulation and taxes, crime, and the most significant obstacle will provide information regarding this research's primary focus. The performance and innovation and technology sections will provide data on how the business environment is affecting the firms' performance, growth, productivity, employment, process, and product innovation.

This survey follows the Enterprise Surveys Global Methodology. The purpose of this methodology is to achieve two primary goals. Firstly, to benchmark the business environment for the investment of new entrepreneurship of each economy across the world and secondly, to conduct performance analysis and investigate the effect of business environments on the productivity of that entrepreneurship. To achieve these goals, the Enterprise Surveys Global Methodology, designed its sampling method in a specific form. This design's goal is to generate a sample which represents the country's non-agricultural private economy. The sectors which this sample will include are manufacturing, retail, and service. Moreover, this sample should be big

enough to accurately represent the whole country's business environment and make sure that the data are statistically reliable. For achieving this goal, the sample size for each industry should have a level of precision at a minimum of 7.5% and at least 90% confidence intervals about the estimations of population percentages and evaluation of the mean log of sales in each of the industries.

3.2. Sampling Methodology

The sampling methodology used for Enterprise Surveys is stratified random sampling. Stratified random sampling is a method of sampling which divides the population into smaller groups called strata which makes the chosen sample the closest match to the population (Enterprise Surveys, 2017, retrieved from: http://www.enterprisesurveys.org).

3.2.1. Sample size

Sample sizes for the Enterprise Survey are determined by the degree of stratification in each level of the sample. The objective in choosing a sample size is to establish an acceptable degree of precision for estimates for first, within size levels, and second, the different levels in regional strata, and third, for the various sectors of stratification.

The calculation of sample size depends on the variance of each indicator in the sample, and since Enterprise Survey contains more than 150 symbols, this calculation is not going to be simple. However, since the majority of signs are proportions, for example, firms who engage in Y activity, the variance of a portion is bounded. Regarding the maximum variance (0.5), the minimum level of precision is guaranteed, and in this way, the calculation of the sample size will be simplified. For achieving the 7.5% precision on estimates of the log of sales, the minimum sample size required for each country and in each stratum of the sector has to be determined carefully.

The strata for Enterprise Surveys are the firm size and the business sector. These strata are designed to make the sample a closest match to the population. The firm size strata for Enterprise Surveys divides firms into three groups based on their number of employees; small, medium, and large. Small firms are the firms with 5-19 employees, medium firms with 20-99 employees, and large firms with over 100 employees. Companies with less than five employees will be dropped from the survey.

Regarding sector stratification, the manufacturing, retail and service industries with ISIC codes 15-37, 45, 50-52, 55, 60-64, and 72 (ISIC Rev.3.1) are the main business sectors of concerns in this survey. The service category will include companies active in sectors such as construction, retail, wholesale, hotels, restaurants, transport, storage, communications, and IT. The retail category will include companies in wholesale and retail. The manufacturing category will include companies active in manufacturing metals and machinery, electronics, chemical and pharmaceuticals, wood and furniture, non-metallic and plastic materials, and auto and auto components.

The stratification by sector of activity is being measured by the size of the economy which is measured by Gross National Income (GNI) of each county. The table below indicates the classification of the size of the economies and the number of interviews which have to be conducted in each of those economies. This table also shows the number of strata needed in each sector, in each economy. For instance, in very small countries whose GNI is less than $15 billion, for choosing a sample, the data was stratified into two groups; one manufacturing and another which includes firms who are active in retail and service, and with 75 interviews allocated to each of the groups. For small economies, with $15-100 billion GNI, all firms were stratified into three groups; manufacturing, service, and retail. This time the total sample size should be 360 interviews, and each of our three strata should have 120 interviews. In medium-size economies, the four most crucial manufacturing subsectors of the country will each separately become a stratum, and the remaining manufacturing firms will be grouped into another group in the manufacturing sector. Accordingly, in medium-sized countries, manufacturing firms should be grouped into five strata, service firms in one stratum, and retail in other strata. In total, we will have seven different strata in medium size and a total of 1000 interviews; as a result, we should choose around 142 firms from each stratum. Last but not least,

in large economies with a GNI of over $500 billion, six manufacturing sectors should be selected as strata, and the remaining manufacturing sub-sectors will be grouped in the 7th strata. One stratum for service industries and another for retail industries. Large economies should contain 1320 interviews among nine different strata, which means, from each stratum, we should have around 146 interviews. The reason for choosing a different number of strata in manufacturing than in retail and services in different countries, is because of the differences in actual ratios of the population. For instance, in very small economies, usually, the number of manufacturing firms is equal to the sum of the number of firms active in the service and retail sectors (Enterprise Surveys, 2017, retrieved from; http://www.enterprisesurveys.org).

Size of the economy	*GNI* *As of 2008*	*Number of strata in manufacturing industries*	*Number of strata in service industries*	*Number of strata in retail industries*	*Total sample size*
Very small	<$15 billion	1	Together 1		150
Small	$15-100 billion	1	1	1	360
Medium	$100-500 billion	5	1	1	1000
Large	>$500 billion	7	1	1	1320

3.2.2. Data Collection

Ideally, the population and the name, number of employees, and the sector of activity of the firms will be extracted from the country's statistical office. Occasionally the list of firms can be obtained from business associations within the state. All the companies should be registered and have a legal status of privately held Limited Liability Company, Shareholding company, Sole Proprietorship, Limited Partnership, or publicly listed company. The companies which are 100% government owned will be dropped from the survey since this survey tries to represent their own private companies.

Afterward, when the list of firms is obtained, the clustering phase will start. In this phase, the contractors will divide firms into different strata based on sector, geographical region, and size.

Then they will randomly contact the firm within each stratum to identify the possible sample. Next, the interview group contacts the firms to set a meeting with managers of the firms to conduct the survey. Interviewers set a meeting with the top managers of each of the firms. The mode of data collection is face-to-face interviews.

Conducting the data is being done by trained interviewers. Due to the sensitivity of the questions such as bribery and corruption in the public service of the country, private contractors are being hired by the World Bank to acquire data from firms. These private parties should not have any correlations to government, governmental agencies, or institutions associated with the government. Confidentiality of the survey respondents carries a significant role, not only to assure the integrity, confidence, and the accuracy of the quality of the data, but also to encourage the interviewees to participate in the survey.

3.2.3. Instruments

The Enterprise Survey collects data on topics such as; firm characteristics, gender participation, access to finance, annual sales, costs of inputs/labor, workforce composition, bribery, licensing, infrastructure, trade, crime, taxation, corruption, competition, capacity utilization, land and permits, informality, business-government relations, innovation and technology, and performance measures. Over 90% of the questions are designed to give information about the country's business environment, and the remaining questions are regarding the opinion of the managers about the biggest obstacle to their firm's growth and performance.

According to this methodology, Enterprise Survey should be answered by business owners and top managers. Business owners and senior managers are a great source to determine the degree of corruption of a public official. Because of the secret nature of corruption, regular employees probably won't acknowledge the deals their top managers make with a public official. As a result, the best parties who have a vast knowledge of the firm and also are also aware of the unofficial agreements between their firm and public officials, are top managers or business owners of the firm.

This survey has two different versions; manufacturing, which will be used for manufacturing firms and service, which will use for service and retail industries. The manufacturing survey module has some additional questions about the number of production employees. This extra data will give this research the ability to determine the effect of the number of employees and size on different sectors and their impact on innovation.

The interviewers will have a questionnaire manual which gives them specific instruction about the questionnaire. The place of the interview should be in the establishment of the firm, which means the physical location where the business is conducted or where services or industrial operations are performed. Because of the sensitivity of the questions regarding corruption in public officials, the questionnaire will not include any name of the interviewer or the firms' name. All the questions should be read by the interviewer, in the wording and order as they appear on the questionnaire.

3.3. Procedures and Analysis

3.3.1. Access to Data

As it was mentioned in the introduction section, Enterprise Survey is open to public access data. However, the access to data needs contacting the World Bank Group. For this purpose, I wrote a one-page summary of this study and acquired raw data for all developing economies for further analysis. The World Bank Group sent us a file including two documents; raw data and the indicator descriptions.

For the matter of analyzing the data, I will use the STATA software which is a user-friendly software that will make the process of analyses much more straightforward and easier to understand. After exporting the data to STATA, the basic information regarding the data will appear. This data includes data on 136,887 firms in different countries. The total number of variables in this data is 213.

3.3.2. Extract the Relevant Data

By exploring the indicator description of each variable, the most related categories are identified as: Innovation and Technology, Regulation and Taxes, Corruption and Crime. Moreover, according to the literature review on innovation, firm characteristics such as age, sector of activity and size should also be considered as significant variables because of their effect on innovation. Other factors that could also have a crucial effect on innovation such as internal and external resources, are also considered as possible significant variables. In order to get a better understanding of each of the possible variables, Tabulate and Summarize commands are used in STATA. Most of the variables in this data are "yes" or "no" questions. For instance, the variable "bribe"is a question presented as the "percentage of firms expected to give gifts to public officials to get things done". The tabulate command will give me a table as shown below.

percent of firms expected to give gifts to public officials to get thing done	Freq.	Percent	Cum
0	91,412	75.98	75.98
1	28,901	24.02	100.00
Total	120,313	100.00	

Referring to the indicator description in this dataset, "0" is the indicator of "No", and "1" is the indicator of "Yes". According to the table above, in total, 120,312 firms answered to this question, among them, 91,412 or 75.98% of them answered the question "No". These firms don't expect to give gifts to public officials in order to get things done. However, 24.02% of firms in developing economies answered this question "Yes". This simple table gave me a better understanding of the data and each variable.

3.4. Research Design

Identifying the possible variables and the dependent and independent variables will help to create the basic base model of this research as below:

Innovation= f (Age, Sector, Size, R&D, External and Internal resources and region)

Preliminary analysis shows a significant relationship between the elements of property rights and innovation within countries. However, getting a profound understanding of this relationship needs more research and analysis. The effect of other possible significant variables in these relationships such as, firms' size, firms' age, governmental loans, foreign investments, and industry or sector of activity needs to be investigated in further analyses.

The data has two different variables to determine the innovation. One of these variables is about product and service innovation. The question for this variable in the questionnaire is:

"During the last three years, has this establishment introduced new or significantly improved products or services? "

The interviewee can answer yes or no.

Another question about innovation, is about the process innovation with this question:

"During the last three years, has this establishment introduced any new or significantly improved process? These include; methods of manufacturing products or offering services; logistics, delivery, or distribution methods for inputs, products, or services; or supporting activities for processes? "

The interviewee can answer yes or no. Following is the table for these dependent variables:

Table 1.

Dependent variable name	Description
prodservis_inno	Percent of firms that introduced a new product/service
process_inno	Percent of firms that introduced a process innovation

In conclusion, the variables "prodserv_inno" and "process_inno" have been chosen as the outcome of interest or dependent variables in this thesis. The first variable shows if firms have a product or service innovation and the second, shows if firms have a process innovation. Analyzing the number of innovations presented by each firm or the quality or success rate of innovation is not possible due to data limitations. The only questions regarding innovation in our questionnaire, asks firms whether they have an innovation or not, and whether they invest in R&D.

Possible independent variables in each of the main factors which might affect innovation in our main model should be chosen in order to proceed to the next level of analysis, where we choose the significant independent variables in our model. The Enterprise Survey contains data about 139 countries and this data includes all firm sizes. However, this research focuses only on small and medium-sized firms. In order to restrict the firms' sizes, all large firms which have more than 250 employees have been dropped in our population. Sector, region and size variables in the data are categorical. We will need to create dummy variables for categorical variables in order to be able to analyze them. For this purpose, the size variable which now has three categories of very small, small, and medium; two dummy variables of very small and medium defined. Two dummy variables of manufacturing and service have been defined for sector. As mentioned in Chapter 2, another possible significant variable could be geographical region. Enterprise Surveys divide counties into 6 regional groups in order to give researches the ability and ease of doing regional analysis on data. Five dummy variables are defined in order to give us the ability to use region in our logistic regression. However, based on the nature of the dummy variables, the base variable cannot be included in the regression model, but the coefficients of the other dummy variables will reveal the effect of the base category on the dependent variable.

By continuing the basic analysis, and with the help of literature, I chose the possible significant variables which can affect innovation. According to literature review on innovation, age, sector, size, R&D investments and the internal and external resources are the most significant variables which affect innovation. All possible variables have been chosen to analyze the effect of internal resources on innovation, variables such as; top managers years of experience, percent of firm

offering formal training and the number of skilled workers and the percent of firms with female in their top management. Possible significant external factors which can affect innovation are; political insatiability, percent of firms who have a bank loan or a line of credit, the proportion of firms with private foreign ownership in the firm.

The table below shows all these possible variables which can affect innovation.

Table 2.

Category	Description	Variable Name
Age	Age of the firm by years	age
Size	Number of employees 5-20	verysmall
	Number of employees 20-100	small
	Number of employees 100-250	medium
Sector	Manufacturing	manufacturing
	Retail	retail
	Service	service
R&D	Whether firms spend on R&D	RD
Region	Africa	AFR
	East Asia and Pacific	EAP
	Eastern European and Central Asia	ECA
	Latin America and the Caribbean	LAC
	Middle East and North Africa	MNA
	South Asia Region	SAR
Internal Resources	Proportion of skilled workers to unskilled workers	skillworker
	Top manager's experience	mngexperience
	Whether firms offer training to employees	training
External Resources	Whether firms have foreign ownership	FDI
	Days to clear imports from customs	customs
	Political instability	obst11
	Percent of firms with a bank loan	loan

In the next stage, I will run a stepwise logistic regression analysis. Logistic regression, or logit model, is used to model dichotomous outcome variables. My dependent variables are

“prodserv_inno” and “process_inno” which represent whether firms have a process or service or process innovation or not. Both of these two variables are dichotomous. As a result, I will use logistic regression. In the logit model the log odds of the outcome are modeled as a linear combination of the predictor variables. The logistic regression will provide the log likelihood, chi-square and p-value for the model which can show us how our model as a whole fit significantly in comparison to a model with no predictors.

By using the stepwise analysis we will only add the variables which are statistically significant to the model. Adding a variable to the model is determined by the p-value of the variable. Variables with high p-values will most likely increase the log likelihood of the model. P-values greater than 0.05 will be deducted from the model and p-values under this number will be considered as significant variables that are affecting the model.

After the analysis of the base model, and by using stepwise analysis, the significant variables which are affecting innovation were identified. In the next step, I will run another stepwise analysis, but this time the factors of corruption, crime and tax corruption will be included. In order to reach our extended model, the stepwise analysis will add each of the independent variables, and keep the significant ones in order to improve the model.

The list of independent variables in crime, corruption, and tax corruption categories which can affect innovation are listed in Table 3.

Table 3. Independent Variables

Category	Description	Variable Name
Corruption	Percent of firms expected to give gifts to public officials (to get things done)	bribe
	Senior management time spent in dealing with requirements of government regulation (%)	mngtime
	Percent of firms identifying business licensing and permits as major constraint	license_cons
	Percent of firms expected to give gifts to get a construction permit	conspermit
	Percent of firms expected to give gifts to get an import license	importlic
	Percent of firms believing the court system is fair, impartial and uncorrupted	court
	Percent of firms corruption as a major constraint	corr_cons
	Percent of firms expected to give gifts to get an operating license	bribeoperate
	Percent of firms expected to give gifts to secure a government contract	bribegc
Crime	Losses due to theft and vandalism against the firm (% of annual sales)	theft
	Percent of firms experiencing losses due to theft and vandalism	exploss
	Percent of firms identifying crime, theft and disorder as a major constraint	crime_cons
Tax Corruption	Percent of firms expected to give gifts in meetings with tax officials	bribetax
	Percent of firms that were visited or required to meet with tax officials	meettax
	If there were visits, Average number of visits or required meetings with tax officials	nembermeet
	Percent of firms identifying tax administration as major constraint	taxadmin_cons

3.5. Summary

The Enterprise Survey conducts data in developing economies regarding their business environment. The confidentiality of the data and the specific methodology used to collect this data makes this data a reliable and valid source to analyze and investigate the business climate in developing economies. The structured questionnaire and educated interviewers across different countries give data a solid structure and the ability to compare the data from different sized firms working in different sectors in different countries, with different incomes and levels of corruption. This data contains information about innovation, tax regulation, corruption, and crime, which are the main focuses of this study. Moreover, other data such as firms' size, sector, age, internal and external factors which can affect innovation are also included in this data which make it a great source for analyzing the relationship between peace, easy taxes and a tolerable administration of justice.

This research aims to understand how corruption, crime, and tax corruption affects innovation. For doing so, the primary analysis on the base model was provided. Afterwards, each of the possible variables of corruption, crime, and tax corruption were added to the equation and statistical determines were used to figure out whether these three elements have a significant effect on the innovativeness of firms in developing countries.

These analyses revealed the true effect of corruption, crime and tax corruption on innovation and the detailed results will be discussed in the next chapter.

Our goal in this model is to identify the most significant factors of corruption, crime and tax corruption and understand how these factors are affecting innovation.

Chapter 4

Analysis

4.1. Descriptive Analysis

Elementary analysis shows a significant relationship between the amount of corruption and a firm's innovativeness. According to the analysis, in comparison to the firms with lower innovation rates, innovative firms consider corruption as their primary obstacle. According to Table 4., 40.36% of firms who have product or service innovation see corruption as a major constraint. In comparison to firms' who don't have a product or service innovation, 32.89% of them consider corruption as a major constraint. Do these percentages show that more firms who have product and process innovation see corruption as a constraint than firms who don't innovate?

Table 4.

Corruption	Percent of firms who have product or service innovation		Total
	No	Yes	
No	30,517	17,891	48,408
	67.11	59.64%	64.14%
Yes	14,954	12,109	27,063%
	32.89%	40.36%	35.86
Total	45,471	30,000	75,471

Pearson chi2(1) = 439.2708 Pr = 0.000

Table 5 shows that 55% of firms who don't have a product and process innovation, expect to have a meeting with tax officials. In comparison, firms have a product and process innovation, 58.66% of them expect to have a meeting with tax officials. Is this table a sign that corruption in taxation will increase the product or service innovation?

Table 5.

Percent of firms expected to give gifts in meetings with tax officials	Percent of firms who have a product or service innovation		Total
	No	Yes	
No	21,010	12,590	33,600
	45.00%	41.34%	43.55 %
Yes	25,681	17,865	43,546
	55.00%	58.66%	56.45%
Total	46,691	30,455	77,146

Pearson chi2(1) = 48.3902 Pr = 0.000

Table 6. contains the percentages of the distribution of all the independent variables on dependent factors. In this table, the relationship between every single independent variable and each of the dependent variables is shown.

The first variable which shows the highest relationship to innovation, is whether firms were required to meet with tax officials. We already discussed the relationship between this variable and product or service innovation, however, this variable showed a strong relationship with process innovation as well, According to Table 6, 53.60% of firms which don't have process innovation, are required to meet with tax officials, and 60% of firms which have process innovations, have a meeting with tax officials.

Another variable which showed a high percentage of change with dependent variable is whether firms think that the justice system and courts are fair. 46.95% of firms who don't have a product and process innovation think that the judicial system is fair. In comparison, firms who have a product and process innovation, 40.62% of them think that the court system is fair. This relationship is different in process innovation. 43.53% of firms who don't have a process innovation think the courts are firms and 45.09% of firms who have a process innovation consider this system fair.

We already discussed about the third variable, firms who consider corruption as a major constraint and its effect on product or service innovation. However, the relationship between

this variable and process innovation was never discussed. According to Table 6, 33.66% of firms who don't have a process innovation consider corruption as a major obstacle and among the firms who have a process innovation, 40% of them consider corruption as a major obstacle.

The next variable is business licencing. The primary analysis showed that among the firms who don't have a product or service innovation, 34.19% of them don't consider business licencing as a major constraint. However, firms who have a product or service innovation, 42.25% of them consider licencing as a major problem. These numbers changed as for process innovation. 12.51% of firms who have a process innovation consider licensing as a constraint, and 14.86% of the firms who have a process innovation consider licensing as a constraint.

Looking at the next variable in the table, 24.12% of firms who don't have a product or service innovation, expect to give gifts in order to get a construction permit, and 20.92% of those who have a product innovation, expect to give gifts to get a permit. In the process innovation, 20.62% of firms who don't have a process innovation think they need to give gifts to get the construction permit however, among the firms who have a process innovation, 23.42% of them expect to give gifts in order to get a permit.

Furthermore, 19.48% of firms who don't have a product or service innovation expect to give gifts to public officials and among the firms who have a product or service innovation, 22.11% of them think that they need to bribe public officials in order to get things done. Among the firms who don't have a process innovation, 18.01% of them expect to bribe the tax official, however, 24.10% of firms who have a process innovation think they should bribe the tax officials.

Among the firms who don't have a product or service innovation, 17.97% of them consider tax administration as a major obstacle, and 23.73% of firms who have a product or process innovation do consider it a major obstacle.. According to Table 6., 18.94 % of firms who don't have a process innovation see tax administration as a major obstacle, and among the firms who have a process innovation, 22.6% of them consider tax administration to be a major obstacle.

Among firms who don't have a product or service innovation, 16.94% of them expect to give gifts in order to get an operation license, and 17.57% of those who have a product innovation expect to give gifts to get an operating license. In process innovation, 15.81% of firms who don't have a process innovation think they need to give gifts to get an operating license, however, among the firm who have a process innovation, 19.20% of them expect to give gifts in order to get a license.

15.99% of firms who don't have a product or service innovation expect to give gifts to tax officials, and among the firms who have a product or service innovation, 15.34% of them think that they need to bribe the tax officials during the meeting. Among the firms who don't have a process innovation, 13.05% expect to bribe the tax official, however, 12.61% of firms who have a process innovation think they should bribe the tax officials.

Among firms without a product or service innovation, 13.90% of them expect to give gifts in order to get an import license, and 12.20% of those who have a product innovation expect to give gifts to get an import license. In process innovation, 10.61% of firms who don't have a product or service innovation think they need to give gifts to get an import license, however, among the firms who have a process innovation, 14.68% of them expect to give gifts in order to get a license.

Among the firms who don't have a product or service innovation, 13.56% of them consider crime as a major obstacle, and this is true for 17.53 % of firms who have a product or process innovation. 14.58 % of firms who don't have a process innovation take crime as a major obstacle, and among the firms who have a process innovation, 16.41% of them consider crime as a major obstacle.

The last variable in Table 6. is whether firms experience any losses due to theft and vandalism during their last fiscal year. Among firms who don't have a product or service innovation, 12.65% of them experienced losses and among firms who have had a product or service innovation, 21.38% of them experience losses. Regarding process innovation, 13.49% of firms without process innovation experienced losses, and among the firms who have had a process innovation, 20.15% of them experienced losses in the last fiscal year.

In total, primary analysis shows a significant relationship between a firms' innovation and corruption, crime, and tax corruption. These analyses are showing that this relationship is not quite simple and other variables could also have a significant effect on this relationship. These relationships will require more complex multivariate analysis to reveal the true effect of corruption on innovation in small and medium sized firms in developing countries.

Table 6.

		Product and Service Innovation		Process Innovation	
Definition	Answer Variable	No	Yes	No	Yes
Firms Required to Meet with Tax Officials	meettax	55.00 %	58.66 %	53.60 %	60.00 %
Firms Believing the Court System is Fair	court	46.95 %	40.62 %	43.53 %	45.09 %
Firms Identifying corruption as a major constraint	corr_cons	32.89 %	40.36 %	33.66 %	40.00 %
Firms Identifying Business Licences as a major constraint	license_cons	34.19 %	42.25 %	12.51 %	14.86 %
Firms Expected to Give Gifts to get a construction permit	conspermit	24.12 %	20.92 %	20.62 %	23.42 %
Firms Give Gifts to Public Officials	bribe	19.48 %	22.11 %	18.01 %	24.10 %
Firms Identifying Tax Administration as a major constraint	taxadmin_cons	17.97 %	23.73 %	18.94 %	22.60 %
Firms Expected to Give Gifts to Get an Operation Licence	bribeoperate	16.94 %	17.57 %	15.81 %	19.20 %
Firms Expected to Give Gifts to Tax Officials	bribetax	15.99 %	15.34 %	13.51 %	17.61 %
Firms Expected to Give Gifts to get an Import Licence	importl	13.90 %	12.20 %	10.61 %	14.68 %
Firms Identifying Crime as a Major Constraint	crime_cons	13.56 %	17.53 %	14.58 %	16.41 %
Firms Experiencing Losses	exploss	12.65 %	21.38 %	13.49 %	20.15 %

4.2. Main Analysis

4.2.1 Product or Service Innovation

4.2.1.1. Base Model

Column 1 of Table 7 shows the result of the analysis of the base model. In this model we did a stepwise estimate of all the variables mentioned in Table 2. The stepwise estimate dropped the insignificant independent variables from the model and only kept the variables which will give the best fit for the model. The dependent variable for this column is product or service innovation.

Interestingly, among the dependent variables in Table 2, firms' age, and size are not statistically significant in process and service innovation. Although, the literature on the effect of size and age of the firms and innovation is vast, the analyses in my research doesn't support any relationship between age or size and product and service innovation.

Another insignificant factor on product and process innovation is the number of days firms need to clear their imports from customs is not significant in their product and service innovation.

According to literature, political instability could also affect innovation within a country, however, the analysis isn't showing any significant relationship between this factor and product, service, and process innovation. Accordingly, this variable was dropped by the analysis.

Table 7. Analysis

		Product and Service Innovation				Process Innovation			
		column 1		column 2		column 3		column 4	
		Base model		Extended model		Base model		Extended model	
Variable Definition	variable Name	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value
Firms' age	age					0.998	0.001	0.995	0.000
Africa	AFR	1.829	0.000	1.784	0.000	1.101	0.029	1.085	0.040
East Asia and Pacific	EAP	0.551	0.000	0.555	0.000	0.473	0.000	0.466	0.000
Eastern European and Central Asia	ECA	0.815	0.000	0.784	0.000	0.317	0.000	0.282	0.000
Latin America and the Caribbean	LAC	1.791	0.000	1.681	0.000	0.561	0.000	0.524	0.000
Middle East and North Africa	MNA	0.669	0.000	0.637	0.000	0.310	0.000	0.277	0.000
R&D	RD	4.668	0.000	4.640	0.000	4.945	0.000	4.813	0.000
Employee Training	training	1.771	0.000	1.758	0.000	1.846	0.000	1.734	0.000
Managers Experience in Years	mngexperience	1.004	0.000	1.003	0.011				
Foreign Ownership	FDI	1.002	0.000	1.001	0.024	1.003	0.000	1.002	0.005
Firms with a Bank Loan	loan	1.004	0.000	1.003	0.000	1.004	0.000	1.004	0.000
Firms Experiencing Losses	exploss			1.003	0.000			1.002	0.000
Firms Required to Meet with Tax Officials	meettax			1.0005	0.000			1.002	0.000
Firms Identifying corruption as a major constraint	corr_obst			1.178	0.000			1.141	0.000
Firms Give Gifts to Public Officials	bribe			1.168	0.000			1.247	0.000
Firms Believing the Court System is Fair	court			0.907	0.000				
Firms Identifying Crime as a Major Constraint	crime_cons			1.216	0.000				

The regions show a significant effect on product or service innovation. The region variable was a categorical variable with six different categories. I generated five different dummy variables of Eastern Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), East Asia and Pacific (EAP), Africa (AFR), the Middle East and North Africa (MNA). South Asia (SAR), the sixth category was chosen as the base category. According to Table7. on average, firms in the region of Africa, have 1.8-times greater odds of having product or service innovation than firms in South Asia, when all the other variables are the same. Firms in East Asia and Pacific region have 0.55-times odds of having a product or service innovation than South Asian firms on average, when all other variables are the same. On average, Eastern European and Central Asia firms have 0.815-times odds of having product or service compared to firms in South Asia, when all other variables are the same. Accordingly, Latin America and the Caribbean firm, have 1.791-times greater odds of having a product or service innovation than firms in South Asia on average, with other variables unchanged. The last category in regions is firms in Middle East and North Africa region. The firms in this region have 0.669 the odds of having a product or service innovation than firms in South Asia, on average while the other variables remain unchanged.

The R&D variable showed a high relationship with product or service innovation. According to Table 7. firms who spend on R&D have, on average, 4.7-times greater odds of having a product or service innovation compared to firms who don't spend on R&D, while the other variables are the same.

Furthermore, the training variable showed a strong relationship with the product or service innovation as well. When all other variables are unchanged, on average, the odds of having a product or service innovation in firms who offer training for their employees is 1.771-times more than firms who don't offer training.

The experience of top management also showed a significant effect. A one-year increase in the experience of the top management, increases the odds of having a product or service innovation by 1.004-times.

Having a foreign direct investor in the firm also has a significant effect on product or service innovation. According to Table 7., on average, the odds of having a product or service innovation in firms who have a foreign direct investor is 1.002-times the firms who don't have an FDI.

In the analyses of the financial resources available to firms, firms with a bank loan, on average, have 1.004-times the odds of firms without any loans in having a product or service innovation, when all other variables are unchanged.

In conclusion, the factors affecting product or service innovation are: age, region, R&D, training of the employees, management experience, FDI and bank loans.

4.2.1.2. Extended Model

The second column (column 2) of Table 7 indicates the model after adding corruption, crime, and tax corruption to the base model. The analysis method is again, stepwise estimates. Stepwise estimates, will add each variable to the model and will drop the insignificant variables which are not improving the model.

A variable that showed change in its significance, both in the base and extended model, is FDI. Foreign direct investment in the firm was significant in the base model with a p-value of less than 0.000, however, this p-value raised up to 0.024. This number is still in the significance range, meaning that FDI is still significant, however, the significance of this variable got weaker. In the extended model, firms who have foreign direct investment them have on average 1.001-times odds of having a product or service innovation in comparison to firms who don't have FDI.

Variables regarding licensing; "conspermit", "importlic", or "operatlic" didn't show a significant effect on product or service innovation as well. These variables indicated whether firms expected to give gifts in order to get a construction permit, import license or operating license.

Furthermore, the theft variable also didn't show any significant relationship with product or service innovation. This variable showed the proportion of losses due to theft and vandalism to annual sales, and interestingly, this proportion does not have a significant effect on firms' product or service innovation.

One of the insignificant variables which was dropped from the base model is "bribetax", which showed whether firms expected to pay bribes in meeting with tax officials. According to analysis, this variable is not significant in the firms' product or service innovation. Another insignificant variable regarding taxes, is whether firms identify tax administration as a constraint. The number of meetings between top managers of firms and tax officials, also didn't illustrate a significant relationship with product or service innovation.

Among the variables of tax corruption, interestingly, only one variable has a significant effect on product or process innovation. The "meettax" variable, which shows firms that were visited or required to meet with tax officials, has, on average, 1.0005-times greater odds of having product or service innovation.

Two of the variables of crime showed a significant effect on product or service innovation. According to Table 7. Column 2, the firms experiencing losses due to theft and vandalism, on average have 1.003-times odds of having product and process innovation. Also, firms who consider crime, theft, and vandalism as a major constraint on the way to growth on average have 1.216-times odds of having product or service innovation in comparison to firms who don't consider crime, theft, and vandalism as a major constraint.

The bribe variable indicates whether firms expected to give gifts to public officials to get things done. This variable also showed a positive relationship with innovation. Firms who expected to give gifts to public officials have 1.168-times odds of having a product or service innovation. Moreover, firms who consider corruption as a major constraint (corr_cons variable) on average have 1.178-times odds of having a product or service innovation in comparison to firms who don't.

Another variable which indicates firms who believe the court system is fair and impartial showed also a significance effect on innovation. According to Table 7 column 2, firms who

believe the court system is fair and impartial on average have 0.907-times the odds of having a product or service innovation in comparison to firms who think the court system is unfair. Among the variables of corruption, crime, and tax corruption, this variable is the only variable which have a negative effect on product or service innovation.

4.2.2. Process Innovation

4.2.2.1. Base Module

Column 3 of Table 7 shows the result of the analysis of the base model for process innovation. In this model we did a stepwise estimate of all the variables mentioned in Table 2. The stepwise estimate dropped the insignificant independent variables from the model and only kept the variables which will give the best fit for the model. The dependent variable for this column is process innovation.

Unlike product or service innovation, firms' age in process innovation have a significant effect. A single year increase in the firm's age changes the odds of firm's having a process innovation by 0.998-times when all other variables are the same. In other words, firms' age has a negative effect on process innovation.

Regions also played a significant role in process innovation. African firms on average, have 1.101-times the odds of having a process innovation than firms in South Asian, when all other variables remain the same. In the East Asia and Pacific region, firms have 0.4733-times the odds of having a process innovation than firms in South Asia on average, when all other variables remain unchanged. On average, firms which are in Eastern European and Central Asia have 0.317-times the odds of having a process innovation than firms in South Asia. Latin American and the Caribbean firms have 0.561-times the odds of firms in South Asia to have process innovation on average, while the other variables remain the same. On average, Middle Eastern and North African firms have 0.310-times the odds of having a process innovation than firms in South Asia.

The R&D variable also showed a strong effect on process innovation. The firms who spend on R&D have 4.945-times the odds of having process innovation in comparison to firms who don't spend on R&D, on average.

Top managements' years of experience was a significant factor on product or service innovation. However, interestingly, this variable is not statistically significant on process innovation.

Foreign direct investment also had a significant effect on process innovation. On average, firms which have a foreign direct investment have 1.003-times the odds of having a process innovation than firms who don't have FDI.

Financial resources also show their significant effect on process innovation. On average, firms who have a bank loan or a line of credit are 1.004-times more likely to have a process innovation than firms who don't have a loan.

4.2.2.2. Extended Model

The second column (column 4) of Table 7 indicates the model after adding corruption, crime, and tax corruption to the base model. The analysis method is stepwise logistic regression. Stepwise estimates will add each variable to the model and drop the insignificant variables which are not improving the model.

One of the significant variables is FDI. In the extended model, firms who have foreign investment in them, on average, have 1.003-times the odds of having process innovation than firms who don't have FDI.

One of the insignificant variables which was dropped from the base model, is "bribetax", which showed whether firms expected to pay bribes in meeting with tax officials. Another insignificant variable, is related to taxes and whether firms identify tax administration as a constraint. The number of meetings between top managers of the firm and tax officials, also didn't illustrate a significant relationship with process innovation.

Furthermore, regarding the crime variables the "theft" variable also didn't show any significant relationship with process innovation. This variable represented the proportion of losses due to theft and vandalism to annual sales, and interestingly, this proportion is not significant on firms' process innovation. Variables regarding licensing; 'conspermit', 'importlic', and 'operatlic' also didn't show a significant effect on process innovation.

Managers experience in years, which was statistically significant in product or service innovation, does not have a significant effect on process innovation and was therefore dropped by stepwise analysis.

One of the variables of crime showed a significant effect on process innovation. Firms experiencing losses due to theft and vandalism, on average, have 1.002-times the odds of having process innovation compared to firms who don't experience any losses. Unlike the product or service innovation, in process innovation, the fact that firms consider crime, theft, and vandalism as a major constraint had no statistically significant effect on process innovation.

The only variable on tax corruption that showed a significant effect on process innovation is 'meettax'. on average, firms which required to meet with tax officials, have 1.002-times the odds of having process innovation than firms who don't meet with tax officials.

Factors regarding corruption show a strong and significant relationship with process innovation. For example, firms who identify corruption as a major obstacle, on average, have 1.141-times greater odds of having process innovation than firms who don't consider corruption as a constraint. Lastly, on average, firms who expected to give gifts to public officials, have 1.247-times greater odds of having a process innovation compared to the firms who don't expect to give gifts to public officials.

4.4. Goodness-of-Fit Test

After designing the extended model, one important measure is to evaluate how well this model predicts the outcome of interest compared to the base model. Among the two

goodness-of-fit models; Pearson statistics and residual deviance, I will choose the residual deviance test which is more common in logistic regression with log likelihoods present.

For doing this test, for product or service innovation, we will need the log likelihood of both the base model and the extended model. The difference of the log likelihoods of these two models is chi-square distributed which will be used to compare with the critical chi-square value. The degrees of freedom for finding the critical chi-square value, is the difference between the number of variables of the base model and the extended model (Allison, 2014).

The log likelihood for base model of product or service innovation is -40851.477 and the log likelihood of the extended model for product and process innovation with corruption, crime, and tax corruption is -32149.64. The difference between these two log likelihoods is chi-square distributed which is equal to 8701.837. The degree of freedom for finding the critical chi-square is 6 (since six variables have been added to the base model). By looking at the critical values of the chi-square distribution, the different probabilities of exceeding the critical value with six degrees of freedom are shown in Table 8. Our chi-square value was 8701.837 which is higher than all the critical values in these three levels. Which indicates that our extended model significantly improved the base model and the final model is improving the base model in predicting the outcome.

Table 8.

	probability of exceeding the critical value		
d	0.05	0.01	0.001
6	12.592	16.812	22.458

The log likelihood for the base model of process innovation is -41102.425 and the log likelihood of the extended model for process innovation is -34643.955. The difference between these two log likelihoods is chi-square distributed and is equal to 6458.47. The degree of freedom for finding the critical chi-square values is 4, since the number of

variables of the base model of process innovation was ten and the number of variables of the extended model of process innovation was fourteen. By looking at the critical values of the chi-square distribution, the different probabilities of exceeding the critical value with four degrees of freedom can be found in Table 9. Our chi-square distributed value was 6458.47, which is higher than all the critical values in these three levels. Which indicates that our extended model significantly improved the base model and is doing a better job at explaining our outcome of interest, or process innovation.

Table 9.

	probability of exceeding the critical value		
d	0.05	0.01	0.001
6	9.488	13.277	18.467

4.5. Correlations

Correlations refer to an association, connection, or any form of relationship, link or correspondence between variables. In statistical terms, correlation is a method of assessing a possible two-way linear association between two variables. Correlations are calculated by correlation coefficients which show the degree of linear association between two variables. This number could vary between -1 to +1. The correlation coefficients of zero between two variables indicates no relationship between those two. The negative values of this coefficient show a negative correlation between two variables and positive values show a positive effect. As the correlation coefficient between two variables get closer to ±1, the correlation between those two variables becomes stronger (Hinkle, Wiersma , & Jurs, 2003). The most common acceptable strong correlation coefficient value in academic literature are values over 0.8, and values less than 0.5, are considered as a weak correlation between variables (Myers & Myers, 1990). Since the correlation coefficients between all of our variables are less than 0.5, as seen in Table 10., we can conclude that the correlations between our variables are not affecting our models.

Table 10. Correlation Matrix

	age	verysm~l	small	RD	AFR	EAP	ECA	LAC	MNA	skillw~r	training	mngexp~e	loan	FDI	exploss	corr_o~t	bribe	crime_~s	meettax	mngtime	theft	court	mngtime	licens~s	importl	operat~c	import~c	bribegc	taxadm~s	customs	loan	politi~e
age	1.00																															
verysmall	-0.16	1.00																														
small	-0.03	-0.40	1.00																													
RD	0.16	-0.20	-0.10	1.00																												
AFR	0.05	0.09	0.10	-0.05	1.00																											
EAP	-0.15	0.17	-0.03	-0.15	-0.11	1.00																										
ECA	-0.03	-0.08	-0.02	-0.16	-0.10	-0.05	1.00																									
LAC	0.08	-0.05	0.01	0.25	-0.56	-0.28	-0.26	1.00																								
MNA	-0.08	-0.05	0.00	-0.10	-0.14	-0.07	-0.06	-0.35	1.00																							
skillworker	0.08	-0.30	-0.37	0.09	-0.10	-0.01	0.21	-0.14	0.21	1.00																						
training	0.13	-0.17	-0.09	0.33	-0.13	-0.08	-0.03	0.27	-0.24	0.03	1.00																					
mngexperie~	0.40	-0.13	0.08	0.01	-0.06	-0.08	-0.03	0.07	0.05	0.10	-0.05	1.00																				
loan	-0.04	-0.04	-0.06	0.10	-0.19	0.00	-0.12	0.26	-0.13	-0.11	0.18	0.04	1.00																			
FDI	-0.10	-0.03	-0.07	0.01	-0.01	0.01	-0.07	0.11	-0.05	0.03	0.01	-0.17	-0.07	1.00																		
exploss	0.03	-0.01	-0.01	0.12	-0.02	0.08	-0.11	0.16	-0.21	-0.03	0.15	0.01	0.16	0.12	1.00																	
corr_obst	0.00	0.00	0.09	-0.02	-0.17	-0.05	-0.06	0.25	-0.03	-0.10	0.05	0.12	0.08	0.08	0.06	1.00																
bribe	-0.12	0.11	-0.10	-0.11	0.07	0.24	0.00	-0.16	0.02	0.05	-0.03	-0.14	-0.09	0.12	0.07	0.22	1.00															
crime_cons	-0.02	0.02	-0.08	0.06	0.00	-0.03	-0.01	0.15	-0.12	-0.01	0.02	-0.10	0.07	0.12	0.25	0.21	0.17	1.00														
meettax	-0.05	-0.02	-0.03	0.01	0.15	0.05	0.13	-0.27	0.10	0.11	-0.03	-0.14	-0.14	-0.02	0.03	0.01	0.09	0.02	1.00													
mngtime	0.01	0.01	-0.05	0.00	-0.15	-0.11	-0.07	0.34	-0.19	-0.11	0.12	0.04	0.13	0.06	0.15	0.26	0.05	0.25	0.00	1.00												
theft	-0.08	0.04	0.10	0.06	0.17	0.06	-0.01	-0.06	-0.11	-0.08	0.12	-0.05	0.05	0.07	0.51	0.02	0.10	0.15	0.07	0.06	1.00											
court	0.04	-0.02	-0.03	-0.04	0.16	0.01	0.13	-0.33	0.10	0.10	-0.06	0.02	-0.17	-0.08	-0.13	-0.32	-0.09	-0.26	0.16	-0.22	-0.08	1.00										
mngtime	0.01	0.01	-0.05	0.00	-0.15	-0.11	-0.07	0.34	-0.19	-0.11	0.12	0.04	0.13	0.06	0.15	0.26	0.05	0.25	0.00	1.00	0.06	-0.22	1.00									
license_cons	-0.15	0.04	0.02	-0.05	-0.01	-0.04	-0.02	0.03	0.03	-0.02	-0.01	0.01	0.02	-0.08	0.10	0.23	0.13	0.34	0.06	0.08	0.15	-0.23	0.08	1.00								
importl	-0.03	-0.01	0.00	-0.09	0.03	0.26	0.05	-0.24	0.08	0.05	-0.12	0.02	-0.06	0.06	-0.05	0.08	0.36	0.02	-0.05	-0.04	0.04	-0.04	-0.04	0.07	1.00							
operatlic	-0.05	-0.01	-0.03	0.05	-0.17	-0.05	-0.07	0.27	-0.12	-0.08	0.04	0.06	-0.04	0.02	0.06	0.07	-0.05	0.14	-0.01	0.06	-0.01	-0.17	0.06	0.29	-0.04	1.00						
importlic	0.06	-0.05	0.00	0.10	-0.11	-0.03	-0.06	0.20	-0.12	-0.01	0.03	0.19	0.12	-0.01	0.18	0.17	0.15	0.09	0.01	0.22	0.11	-0.15	0.22	0.15	0.09	0.15	1.00					
bribegc	-0.16	0.12	-0.02	0.02	0.12	0.14	-0.03	-0.11	-0.06	-0.07	0.00	-0.16	0.03	0.04	0.08	0.12	0.63	0.11	-0.10	0.02	0.13	-0.09	0.02	0.07	0.30	-0.08	0.00	1.00				
taxadmin_c~	-0.09	0.11	-0.08	0.10	0.12	0.11	0.04	-0.11	-0.04	0.00	-0.17	0.05	0.08	0.01	0.14	0.21	0.15	0.34	0.10	0.09	0.13	-0.05	0.09	0.40	0.10	-0.02	0.17	0.12	1.00			
customs	0.08	-0.03	-0.09	0.15	-0.01	-0.08	-0.10	0.19	-0.10	0.07	0.14	-0.06	0.10	-0.01	-0.06	0.12	-0.08	0.02	-0.05	0.08	-0.10	-0.20	0.08	0.04	-0.09	-0.01	0.05	-0.04	0.03	1.00		
loan	-0.04	-0.04	-0.06	0.10	-0.19	0.00	-0.12	0.26	-0.13	-0.11	0.18	0.04	1.00	-0.07	0.16	0.08	-0.09	0.07	-0.14	0.13	0.05	-0.17	0.13	0.02	-0.06	-0.04	0.12	0.03	0.08	0.10	1.00	
politicins~e	0.11	0.09	-0.15	0.04	0.01	-0.02	0.12	-0.06	0.05	-0.07	-0.01	0.05	-0.03	0.11	-0.02	-0.04	-0.08	-0.03	0.02	-0.05	0.06	0.05	-0.05	-0.13	0.03	-0.06	-0.03	-0.05	-0.07	0.00	-0.03	1.00

4.6. Multicollinearity Test

The variance inflation factor (VIF) ratios will be used to test multicollinearity of the independent variables. VIF is the ratio of variance in a model with multiple variables, divided by the variance of a model with one variable alone (Fox, 1984; cited in Schroeder et al., 1990). It quantifies the degree of multicollinearity in regression and logistic regression models. A value of 1 in VIF means that the predictor is not correlated with other variables. However, higher values show greater correlation among the variables. Values of more than 4 or 5 are sometimes regarded as being moderate to high, with values of 10 or more being regarded as very high (Neter et al., 1996; Mansfield and Helms, 1982).

Table11 shows the VIF values for each of the variables. Since all the VIFs are less than 5, the variables in this model do not have a multicollinearity problem.

Table 11. VIFs

Variable	*VIF*
age	1.41
verysmall	1.95
small	2.25
RD	1.54
AFR	7.36
EAP	4.53
ECA	3.57
LAC	2.81
MNA	3.91
skillworker	1.99
training	1.6
mngexperie~e	1.43
loan	3.05
FDI	1.31
exploss	1.77
corr_obst	1.6
bribe	2.81
crime_cons	1.47
meettax	1.31
mngtime	1.33
theft	1.64
court	1.42
mngtime	1.48
license_cons	3.7
importl	1.5
operatlic	1.39
importlic	1.48
bribegc	3.07
taxadmin_cons	1.73
customs	1.42
loan	3.15

Chapter 5

Discussion and Conclusion

5.1. Overview

This research examined the effect of corruption, crime, and tax corruption on small and medium-sized firms' innovation in developing countries. It presented evidence regarding the business environment factors and their effect on innovation with a particular emphasis on corruption.

In the light of the results presented in chapter four, a general summary and discussion of the findings and their contributions to the field will be presented in the following sections. Then, the effect of corruption, crime, and tax corruption on innovation will be discussed in separate sections. Next the implications of the study will be briefly dealt with and, at the end, the limitations of the study and suggestions for further research will be presented.

5.1.2. Findings regarding innovation in developing countries (general summary and discussion of the findings)

To discuss the business environment and its effect on innovation, this research started its analysis with the factors affecting innovation. Literature divided these factors into six groups; age, size, sector, R&D, internal, and external resources. However, analysis in this research did not show a significant effect of some of these factors on innovation. For instance, age, sector, and size, which were three of the main focuses of literature regarding their effect on entrepreneurship, did not show a statistically significant impact on innovation. Other factors included in internal and external resources mentioned in the literature, such as political instability, the number of skilled workers and delays in customs were not significantly effective on innovation in SME innovation in developing countries, either. However, factors such as R&D expenses, training of the employees, bank loans, and foreign ownership in firms showed a significant effect on innovation.

One of the interesting results of the analysis was about the age of the firm. Age of the firm did not show a significant relationship with product and service innovation while this factor was significant in predicting the process innovation. The relationship between age and process innovation was negative, which indicates that younger firms have more opportunity of having a process innovation than older firms. This fact can be a result of the older firms' more complicated structure; and bureaucracy can be as an obstacle in their way of process innovation. Therefore, more dynamic structures of the younger firms are supporting the process innovation.

In contrast with firms' age, the top manager's experience showed a significant effect on the product and service innovation and no vital relationship with process innovation. This could be an implication of the nature of these two innovations. Product and service innovations are more important in most companies for the experienced managers because they know how major innovations can bring advantages for their firms. As the managers are more experienced, they try to focus on the new products and services. Another reason for this result can be the fact that most of the process innovations are incremental, and managers are not involved in these incremental innovations, and their experience cannot change any part of this innovation.

Another variable which was significant for innovation was found to be geographical regions. Regions in total showed a significant effect on innovation. The impact was positive in some regions and negative in others depending on their region. However, since region can also affect the amount of corruption, crime, and tax corruption, it was necessary to check the correlation coefficients between these factors to figure out if this strong relationship of regions with innovation interacted with corruption, crime, and tax corruption or not. These coefficients showed that regions affected the elements of corruption, crime, and tax corruption. However, these relationships were not significant to affect our research results. As a result, the location of the firm is significant in its' innovativeness.

In the next three sections, we will discuss the effects of corruption, crime, and tax corruption on innovation individually.

5.2. Key Findings to the Research Questions

5.2.1. The Effect of Corruption on Innovation

Among the nine factors of corruption represented in chapter three, seven of them did not show a significant effect on innovation. One of these insignificant factors was management time spent on dealing with requirements of governmental regulations. This factor was not effective on innovation, although the previous literature supported the idea that higher regulations and bureaucracy would waste management's time which could be used in more efforts to support innovation in the firm. We assume that in our study the manager's time spent on dealing with these regulations was partially used to neutralize the negative effects of these regulations on innovation, and as a result, this variable itself did not show a significant effect in this regard.

Another category of variables which did not show a significant relationship with innovation was variables regarding licensing. The variables in this category were whether firms believe that they have to pay bribes to secure a governmental contract, import license, construction permit, and operating license. According to the literature, the fact that firms expect to pay bribes to get licenses can limit their available resources to invest in innovation. Moreover, these kinds of expenses or bribes can discourage innovators by increasing the costs associated with licensing or increasing the risk associated with bribes. However, our analysis did not show any significant negative or even positive effect of this variable on innovation. Accordingly, since managers already expect to pay bribes to secure a governmental contract, import license, construction permit, and operating license, these activities did not affect their product, process, or service innovation in small and medium-sized firms in developing countries. Moreover, the perception of the firms about the licensing did not show a significant relationship with innovation either.

One of the factors of corruption, which showed a significant relationship with innovation was the number of the firms that expected to give gifts to government officials to get things done. Interestingly this relationship was positive, which means when firms expect to give bribe to public officials, tend to have more innovations in their companies. We can conclude that in developing economies with bad business environments, corruption and bribing can support innovation by making firms to seek more innovative capabilities and speedy approaches. This variable supported the "grease the wheels" theory.

However, one of the corruption variables showed a negative association with innovation factors. The perception of firms about whether courts and justice systems were fair had a negative effect on product and service innovation and not statistically significant effect on process innovation in developing countries. When the firms perceived the system of courts to be fair, they tended not to have a product or service innovation. this could be because of the fact that is their product or service is being stolen by other competitors firms and courts cannot prevent this fact by protecting firms property rights, innovative firms will be discouraged from introducing new products or services. However, process innovation is internal and every firm can have process innovation and not letting the competitors know about this innovation. as a result the firm will never need any courts because the process innovation will not be stolen from the company.

Another impressive result from the analysis was the positive relationship between considering corruption as a constraint by the firms and innovation. This relationship could be due the fact that when firms consider corruption as a constraint, they tend to be more prepared to innovate. One of the major things that can encourage innovation is facing with problems and obstacles by the firms' managers and employees. Firms in developing countries with lousy business climate and corruption are facing more problems in dealing with corrupt government officials and regulations. When small and medium-sized firms are encountering these heavy regulations and bureaucracies, they can come up with more innovative ideas in order to avoid possible problems arising from corruption. This fact actually can boost the total SME innovation. The statistical analysis supported this relationship, which in turn supports the "grease the wheels" theory.

5.2.2. The Effect of Crime on Innovation

In the evaluation of the effect of crime on SME innovation in developing countries, we chose three different variables. One of the interesting issues to explore in the crime category was to see if the firms identify crime as a constraint to innovation or not. This variable showed a significant positive effect on product or service innovation and no statistically significant effect on process innovation. This perception of firms had a substantial effect on product or

service innovation because, when firms consider crime as a constraint, they plan to improve their main product or service in order to keep their advantages despite the existence of crime. On the other side, the existence of crime did not affect their process innovation because process innovation is internal to the firm and, therefore, improving processes or process innovations did not have firm-external traces, while affecting their final products or services. Regarding this matter, another argument could be the fact that when firms perceive crime as a constraint, they will try to improve or protect their main business which is presenting better products or services, while processes may not be the primary concern for most of the firms.

Whether firms 'experience losses due to theft and vandalism' showed a significant effect on both product or service and process innovation. According to the literature, firms who experience losses due to theft or vandalism will have lower available resources to appropriate sufficient budget for innovation (Landry, Amara, & Lamari, 2002). Moreover, experiencing losses can discourage innovators with the fear of the possibility of theft or vandalism of their innovations. However, according to our statistical analysis, this relationship was positive and the firms who experienced losses were more willing to have a process, service, and product innovation. This result can be a sign for the fact that small and medium-sized firms in developing economies who experience theft or vandalism tend to do more innovative actions in order to lower their losses or recover from their losses due to theft and vandalism. The amount of these losses was not significantly affecting innovation. The variable which represented the amount of these losses out of firms' sales did not show a significant relationship with innovation.

5.2.3. The Effect of Tax Corruption on Innovation

Among tax corruption factors, the only factor which showed a significant effect on innovation was 'the number of the firms required to meet with tax officials. This relationship was also positive, which means that firms who required to meet with tax officials tended to have more innovation. When firms know that they have to meet with tax officials, they also know that, in their negotiations, they may be able to change the official's opinion about the amount of taxes they have to pay and they maybe, be able to lower their taxes. Lower or

adjusted taxes can encourage firms to have more innovations. Looking at the other side of the coin, this positive relationship could more likely be an indicator of the fact that maybe tax officials are asking to meet with firms who have innovations, since innovative firms tend to grow faster than other firms.

One of the insignificant variables of tax corruption was ‘whether firms believe that they have to bribe tax officials during their meeting’. The number of required meetings with tax officials also did not show a significant effect on innovation. These variables indicate that the tax regulations and corruption in tax administration in developing countries are not affecting the SME innovation. Moreover, the perception of firms about the corrupt tax administration, also, was not significantly affecting the innovation in these countries.

5.3. Implications of the Study: For Theory

This research aimed to develop and run a quantitative analysis of Adam Smith's theory of protected property rights and economic growth in developing countries. The three factors of this theory showed an astonishing relationship with SME innovation in these countries. The elements of crime and corruption did show a significant effect on innovation, and the elements of tax corruption did not have a strong relationship with SME innovations in these countries.

Moreover, literature on the effect of corruption, crime, and tax corruption lack a descriptive quantitative analysis of the effect of these three factors on innovation in these countries. This research shed light on the compound effect of these factors on innovation in developing countries. The literature on the effect of corruption, crime, and tax corruption was ambiguous and unclear about whether these factors had a "grease" or a "sand" effect in the wheels of economic growth. Our findings in this research showed that the elements of crime and corruption were actually easing the way of innovation, while tax corruption mostly did not show a significant effect on SME innovation in developing countries. In general this research supported the "grease the wheels" theory in the effect of corruption and crime on innovation in developing counties.

Furthermore, the literature on crime (as theft and vandalism) was limited, and this research gave important insight into how crime is actually affecting the innovation in these countries.

5.4. Implications of the Study: For Practice

The results of this research shed light on the effect of corruption, crime, and tax corruption on SME innovation in developing countries. These results can help governments and policymakers in these countries to understand which elements of these factors are actually affecting the innovativeness of SME firms in their country and since the results supported the "grease the wheels" theory. However, supporting the “greasing the wheels” theory doesn’t mean that since corruption is helping innovation, the governments should not fight it. As it discussed in the second chapter, corruption has numerous bad effects on business environment which may not be perceived in short term results but in long term it will affect the entrepreneurs and innovators negatively. In conclusion, due to the negative effects of corruption and crime in macro level economies despite the positive short time micro effect of it, governments and policy makers will required suitable alternatives to fight corruption and crime and yet not lowering the innovation. Such alternatives will include a strong justice system (including secure property rights) and effective law enforcement

5.5. Further Research and Limitations

This research used the Enterprise Surveys data by the World Bank group. Although this data gave a great insight into the elements of corruption, crime, and tax corruption, it lacks giving more specific details about innovation. The questions regarding innovation in this data was only asking firms whether they have a process, product, or service innovation. More detailed data regarding the amount or number of innovations, or the types of innovation could draw a more specific picture of how the elements of property rights within these countries can affect the innovativeness of SME firms. Herein, some of the variables which are not significant in whether firms have any product, service, or process innovation, may be significant in the quality or quantity of the innovation. Future researches can investigate the effect of

corruption, crime, and tax corruption on the quality of innovation and add more details regarding this relationship.

Another area of research could compare objective measures of crime and corruption with perceptual measures. For example, Transparency International's Corruption Index which ranks countries based on their corruption level. This index will add actual and objective measures of corruption to this research in which the data was demonstrating the perception of corruption in different countries not the actual amount of corruption.

Furthermore, future research can focus on exploring gender and other minority effects. In this research it is possible that some variables such as gender affected the results. For instance, minority groups or women could perceive higher levels of crime and corruption and that this, in turn, can effect firm level behaviours.

Exploring spatial effects could also be a great are for future research. In the Enterprise Survey 139 countries gouped together as the developing countries. However, not all those countries are equally developing and they are culturally heterogeneous. This is likely to have downplayed the effects in the current analyses and would be an interesting area of future research.

Another area for future research could investigate on the dynamic effects. The data is panel data collected in 2017. Future research could investigate on how the levels of corruption in different countries is changing and how this change is affecting innovation.

Bibliography

Abernathy, W. J., & Rosenbloom, R. S. (1969). Parallel strategies in development projects. *Management Science*, *15*(10), B-486.

Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *Journal of political Economy*, *113*(5), 949-995.

Acs, Z. J., & Armington, C. (2006). *Entrepreneurship, geography, and American economic growth*. Cambridge University Press.

Acs, Z. J., & Audretsch, D. B. (1988). Innovation in large and small firms: an empirical analysis. *The American economic review*, 678-690.

Aidis, R., Estrin, S., & Mickiewicz, T. (2008). Institutions and entrepreneurship development in Russia: A comparative perspective. *Journal of Business Venturing*, *23*(6), 656-672.

Aidis, R., Estrin, S., & Mickiewicz, T. M. (2012). Size matters: entrepreneurial entry and government. *Small Business Economics*, *39*(1), 119-139.

Al-Sadig, A. (2009). The effects of corruption on FDI inflows. *Cato J.*, *29*, 267.

Alchian AA, Woodward S. 1988. The firm is dead: long live the firm. *Journal of Economic*

Allison, P. D. (2014, March). Measures of fit for logistic regression. *In Proceedings of the SAS Global Forum 2014 Conference (pp. 1-13).*

Almus, M. (2002). What characterizes a fast-growing firm?. *Applied Economics*, *34*(12), 1497-1508.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in organizational behavior*, *10*(1), 123-167.

Anokhin, S., & Schulze, W. S. (2009). Entrepreneurship, innovation, and corruption. *Journal of business venturing*, *24*(5), 465-476.

Arundel, A., & Kabla, I. (1998). What percentage of innovations are patented? Empirical estimates for European firms. *Research policy*, *27*(2), 127-141.

Audretsch, D. B., & Acs, Z. J. (1991). Innovation and size at the firm level. *Southern Economic Journal*, 739-744.

Audretsch, D. B., & Thurik, A. R. (2001). What's new about the new economy? Sources of growth in the managed and entrepreneurial economies. *Industrial and corporate change*, *10*(1), 267-315.

Agrast, M. D., Botero, J. C., Ponce, A., Pratt, C. S., & World Justice Project. (2008). *Rule of law index*. Washington, D.C: World Justice Project.

Bailey, D.H. (1966). The effects of corruption in a developing nation. Western Politica Quarterly 19: 719-732. Reprint in A.J. Heidenheimer, M. Johnston and V.T. LeVine (Eds.), Political corruption: A handbook, 934-952 (1989). Oxford: Trans

Bardhan, P. (1997). Corruption and development: a review of issues. *Journal of economic literature*, *35*(3), 1320-1346.

Bartholomew, S. (1997). National systems of biotechnology innovation: complex interdependence in the global system. *Journal of international business studies*, *28*(2), 241-266.

Baumol, W. J. (1996). Entrepreneurship: Productive, unproductive, and destructive. *Journal of business venturing*, *11*(1), 3-22.

Beck, P. J., & Mahler, M. W. (1986). A comparison of bribery and bidding in thin markets. *Economics Letters*, *20*(1), 1–5.

Besley, T., & Ghatak, M. (2010). Property rights and economic development. In *Handbook of development economics* (Vol. 5, pp. 4525-4595). Elsevier.

Bhattacharya, M., & Bloch, H. (2004). Determinants of innovation. *Small Business Economics*, *22*(2), 155-162.

Bird, R., J. Martinez-Vazquez and B. Torgler (2006). Societal Institutions and Tax Effort in Developing Countries, in: J. Alm, J. Martinez-Vazquez and M. Rider (eds.), *The Challenges of Tax Reform in the Global Economy*. New York: Springer, pp. 283-338.

Blau, D. M. (1987). A time-series analysis of self-employment in the United States. *Journal of political economy*, *95*(3), 445-467.

Bon, A. T., & Mustafa, E. M. (2013). Impact of total quality management on innovation in service organizations: Literature review and new conceptual framework. *Procedia Engineering*, *53*, 516-529.

Boudreau, K. J., Lacetera, N., & Lakhani, K. R. (2011). Incentives and problem uncertainty in innovation contests: An empirical analysis. *Management science*, *57*(5), 843-863.

Boudreau, K. J., Lacetera, N., & Lakhani, K. R. (2011). Incentives and problem uncertainty in innovation contests: An empirical analysis. *Management science*, *57*(5), 843-863.

Brouwer, E., & Kleinknecht, A. (1999). Innovative output, and a firm's propensity to patent.: An exploration of CIS micro data. *Research policy*, *28*(6), 615-624.

Brown, E. and Cloke, J. (2006), "The critical business of corruption", critical perspectives on international business, Vol. 2 No. 4, pp. 275-98.

Bruce, D. (2000). Effects of the United States tax system on transitions into self-employment. *Labour economics*, *7*(5), 545-574.

Bruce, D., & Mohsin, M. (2006). Tax policy and entrepreneurship: New time series evidence. *Small business economics*, *26*(5), 409-425.

Buchko, A. A. (1994). Conceptualization and measurement of environmental uncertainty: An assessment of the Miles and Snow perceived environmental uncertainty scale. *Academy of Management Journal*, *37*(2), 410-425.

Busenitz, L. W., Gomez, C., & Spencer, J. W. (2000). Country institutional profiles: Unlocking entrepreneurial phenomena. *Academy of Management journal*, *43*(5), 994-1003.

Calvo, G. A. (2006). *Monetary policy challenges in emerging markets: Sudden stop, liability dollarization, and lender of last resort* (No. w12788). National Bureau of Economic Research.

Carmignani, F. (2005). Efficiency of institutions, political stability and income dynamics. *Public Economics*, *503007*.

Carothers, T. (1998). The rule of law revival. *Foreign Aff.*, *77*, 95.

CEC 1996 Annual Convention. (1995). *TEACHING Exceptional Children*, *28*(1), 84–85. https://doi.org/10.1177/004005999502800124

Chang, E., & Golden, M. (2004). Does Corruption Pay? The Survival of Politician Charged with Malfeasance in the Postwar Italian Chamber of Deputies. *Unpublished paper, Michigan State University and the University of California at Los Angeles*.

Chau, P. Y., & Tam, K. Y. (1997). Factors affecting the adoption of open systems: an exploratory study. *MIS quarterly*, 1-24.

Chen, Y., & Puttitanun, T. (2005). Intellectual property rights and innovation in developing countries. *Journal of development economics*, *78*(2), 474-493.

Cheung, K. Y., & Ping, L. (2004). Spillover effects of FDI on innovation in China: Evidence from the provincial data. *China economic review*, *15*(1), 25-44.

Claessens, S., & Laeven, L. (2003). Financial development, property rights, and growth. *The Journal of Finance*, *58*(6), 2401-2436.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, *35*(1), 128-152.

Crafts, N. (1996). Deindustrialisation and economic growth. *The Economic Journal*, *106*(434), 172-183.

Daellenbach, U. S., McCarthy, A. M., & Schoenecker, T. S. (1999). Commitment to innovation: The impact of top management team characteristics. *R&d Management*, *29*(3), 199-208.

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of management journal*, *34*(3), 555-590.

Damanpour, F. (2010). An integration of research findings of effects of firm size and market competition on product and process innovations. *British Journal of Management*, *21*(4), 996-1010.

Davidsson, P., & Delmar, F. (1997). High-growth firms: characteristics, job contribution and method observations.

Davoodi, M. H. R. (2000). *Corruption, growth, and public finances*. International Monetary Fund.

Démurger, S. (2001). Infrastructure development and economic growth: an explanation for regional disparities in China?. *Journal of Comparative economics*, *29*(1), 95-117.

Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative science quarterly*, 52-73.

Djankov, S., Ganser, T., McLiesh, C., Ramalho, R., & Shleifer, A. (2010). The effect of corporate taxes on investment and entrepreneurship. *American Economic Journal: Macroeconomics*, *2*(3), 31-64.

Djankov, S., Glaeser, E., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2003). The new comparative economics. *Journal of comparative economics*, *31*(4), 595-619.

Domar, E. D., & Musgrave, R. A. (1944). Proportional income taxation and risk-taking. *The Quarterly Journal of Economics*, *58*(3), 388-422.

Dreher, A., & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice*, *155*(3-4), 413-432.

Dreher, A., & Schneider, F. (2010). Corruption and the shadow economy: an empirical analysis. *Public Choice*, *144*(1-2), 215-238.

Dutta, N., & Sobel, R. (2016). Does corruption ever help entrepreneurship?. *Small Business Economics*, *47*(1), 179-199.

Ekblom, P. (2011). Happy returns: Ideas brought back from situational crime prevention's exploration of design against crime.

Elffers, H. (1991). *Income Tax Evasion: Theory and Measurment*. Kluwer.

Erard, B., & Feinstein, J. (1994). *The role of moral sentiments and audit perceptions in tax compliance* (No. 94-03). Carleton University, Department of Economics.

Estrin, S., Korosteleva, J., & Mickiewicz, T. (2013). Which institutions encourage entrepreneurial growth aspirations?. *Journal of business venturing*, *28*(4), 564-580.

Feng, D. A. I. (2005). Positive Research on the Relationship between FDI and Development of China's Service Industry [J]. *International Trade Journal*, *3*, 014.

Fox, J. (1984), *Linear Statistical Models and Related Methods, With Ap- plications to Social Research,* New York: John Wiley.

Freel, M. S. (2005). Perceived environmental uncertainty and innovation in small firms. *Small Business Economics*, *25*(1), 49-64.

Freeman, C., & Soete, L. (1997). Development and the diffusion of technology. *The Economics of Industrial Innovation*, 351-365.

Friedman, E., Johnson, S., Kaufmann, D., & Zoido-Lobaton, P. (2000). Dodging the grabbing hand: the determinants of unofficial activity in 69 countries. *Journal of public economics*, *76*(3), 459-493.

Gentry, W. M., & Hubbard, R. G. (2000). Tax policy and entrepreneurial entry. *American Economic Review*, *90*(2), 283-287.

Geroski, P., & Machin, S. (1992). Do innovating firms outperform non-innovators?. *Business Strategy Review*, *3*(2), 79-90.

Geroski, P., Machin, S., & Van Reenen, J. (1993). The profitability of innovating firms. *The RAND Journal of Economics*, 198-211.

Gordon, R. H., & Cullen, J. B. (2002). *Taxes and entrepreneurial activity: Theory and evidence for the US* (No. w9015). National Bureau of Economic Research.

Green, S. G., Gavin, M. B., & Aiman-Smith, L. (1995). Assessing a multidimensional measure of radical technological innovation. *IEEE transactions on engineering management*, *42*(3), 203-214.

Gumusluoğlu, L., & Ilsev, A. (2009). Transformational leadership and organizational innovation: The roles of internal and external support for innovation. *Journal of Product Innovation Management*, *26*(3), 264-277.

Habiyaremye, A., & Raymond, W. (2013). Transnational corruption and innovation in transition economies.

Hackett, S. M., & Dilts, D. M. (2008). Inside the black box of business incubation: Study B—scale assessment, model refinement, and incubation outcomes. *The Journal of Technology Transfer*, *33*(5), 439-471.

Hajer, M. (2003). A frame in the fields: policymaking and the reinvention of politics. In *Deliberative policy analysis: Understanding governance in the network society* (Vol. 24, pp. 88-110). Cambridge: Cambridge University Press.

Hayes, R. and Abernathy, W. (1980) Managing our way to economic decline. Harvard Business Review, 57, 4, 11±25.

Hayes, R., Wheelwright, S. and Clark, K. (1988) Dynamic Manufacturing: Creating the Learning Organization. New

Hinkle DE, Wiersma W, Jurs SG (2003). Applied Statistics for the Behavioral Sciences 5th ed. Boston: Houghton Mifflin J. International Business Studies 37, 733–746.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (2003). Multiple-comparison procedures. *Applied Statistic for the Behavioral Sciences*, 370-399.

Huntington, S. P. (1968). *Political order in changing societies*. New Haven: Yale University Press.
Kaufman, D., & Wei, S.-J. (2000). *Does 'grease money' speed up the wheels of commerce?* (IMF Working Paper 00/64)

James, S., & Alley, C. (2002). Tax compliance, self-assessment and tax administration.

Johnston, M. (2005). *Syndromes of corruption: wealth, power, and democracy*. Cambridge University Press.

Kaufman, D., Kraay, A., & Mastruzzi III, M. (2003). Governance Matters III: Governance Indicators for 1996–2002. World Bank Policy Research Working Paper No. 3106.

Kaye, T. A. (2014). Taxation and Development Incentives in the United States. *The American Journal of Comparative Law*, *62*(suppl_1), 617-641.

Kelley, D., & Lee, H. (2010). Managing innovation champions: The impact of project characteristics on the direct manager role. *Journal of Product Innovation Management*, *27*(7), 1007-1019.

Khanna, T., & Palepu, K. (1997). Why focused strategies may be wrong for emerging markets. *Harvard business review*, *75*(4), 41-43.

Kimberly, J. R. and M. Evanisko (1981). 'Organizational innovation: the influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations', Academy of Management Journal, 24, pp. 679–713.

Klapper, L., Lewin, A., & Delgado, J. M. Q. (2011). The impact of the business environment on the business creation process. In *Entrepreneurship and Economic Development* (pp. 108-123). Palgrave Macmillan, London.

Knight, K. E. (1967). 'A descriptive model of the intra-firm innovation process', Journal of Business, 40, pp. 478–496.

Koberg, C. S., Detienne, D. R., & Heppard, K. A. (2003). An empirical test of environmental, organizational, and process factors affecting incremental and radical innovation. *The Journal of High Technology Management Research*, *14*(1), 21-45.

Koeller, C. T. (1995). Innovation, market structure and firm size: a simultaneous equations model. *Managerial and Decision Economics*, *16*(3), 259-269.

Kohn, M., & Scott, J. T. (1982). Scale economics in research and development: the Schumpeterian hypothesis. *The Journal of Industrial Economics*, 239-249.

Kunicova, J., & Rose-Ackerman, S. (2005). Electoral rules and constitutional structures as constraints on corruption. *British Journal of Political Science*, *35*(4), 573-606.

Kurer, O. (1993). Clientelism, corruption, and the allocation of resources. *Public Choice*, *77*(2), 259-273.

Lambsdorff, J. G. (1999). Corruption in empirical research: A review. *Transparency International, processed*, *6*.

Lambsdorff, J. G. (2003). How corruption affects productivity. *Kyklos*, *56*(4), 457-474.

Landry, R., Amara, N., & Lamari, M. (2002). Does social capital determine innovation? To what extent?. *Technological forecasting and social change*, *69*(7), 681-701.

Lau, C. M., & Ngo, H. Y. (2004). The HR system, organizational culture, and product innovation. *International business review*, *13*(6), 685-703.

Lederman, D., Loayza, N. V., & Soares, R. R. (2005). Accountability and corruption: Political institutions matter. *Economics & politics*, *17*(1), 1-35.

Leff, N. H. (1964). Economic development through bureaucratic corruption. *American behavioral scientist*, *8*(3), 8-14.

Lessig, L. (2013). “Institutional corruption” defined. *The Journal of Law, Medicine & Ethics*, *41*(3), 553-555.

Levie, J., & Hunt, S. (2004). Culture, institutions and new business activity: Evidence from global entrepreneurship monitor. *Frontiers of entrepreneurship research*, 519-33.

Leys, C. (1965). What is the Problem about Corruption? *The Journal of Modern African Studies*, *3*(2), 215-230.

Lin, C. Y., & Ho, Y. H. (2008). An empirical study on logistics service providers' intention to adopt green innovations. *Journal of technology management & innovation*, *3*(1), 17-26.

Lui, F. T. (1996). Three aspects of corruption. *Contemporary Economic Policy*, *14*(3), 26-29.

Macrae, J. (1982). Underdevelopment and the economics of corruption: A game theory approach. *World Development*, *10*(8), 677-687.

Mahagaonkar, P. (2008). *Corruption and innovation: a grease or sand relationship?* (No. 2008, 017). Jena economic research papers.

Makse, T., & Volden, C. (2011). The role of policy attributes in the diffusion of innovations. *The Journal of Politics*, *73*(1), 108-124.

Mansfield, E. R., & Helms, B. P. (1982). Detecting multicollinearity. *The American Statistician*, *36*(3a), 158-160.

Manual, O. (2005). Guidelines for collecting and interpreting innovation data.

Mauro, P. (1995). Corruption and growth. *The quarterly journal of economics*, *110*(3), 681-712.

Means, G. (2017). *The modern corporation and private property*. Routledge.

Mendonça, S., Pereira, T. S., & Godinho, M. M. (2004). Trademarks as an indicator of innovation and industrial change. *Research Policy*, *33*(9), 1385-1404.

Méon, P. G., & Sekkat, K. (2005). Does corruption grease or sand the wheels of growth?. *Public choice*, *122*(1-2), 69-97.

Meyer, A. D., Brooks, G. R., & Goes, J. B. (1990). Environmental jolts and industry revolutions: Organizational responses to discontinuous change. *Strategic Management Journal*, 93-110.

Miller, D. (1987) The structural and environmental correlates of business strategy. *Strategic Management Journal*, 8, 1, 55±76.

Miller, D. (1988). Relating Porter's business strategies to environment and structure: Analysis and performance implications. *Academy of management Journal*, *31*(2), 280-308.

Mohr, L. B. (1976). Conceptual Issues in the Study of Innovation George W. Downs, Jr. and. *Administrative science quarterly*, *21*(4), 700-714.

Murphy, K. M., Shleifer, A., & Vishny, R. W. (1991). The allocation of talent: Implications for growth. *The quarterly journal of economics*, *106*(2), 503-530.

Myers, R. H., & Myers, R. H. (1990). *Classical and modern regression with applications* (Vol. 2). Belmont, CA: Duxbury press.

Nelson, R. R. (1959). The simple economics of basic scientific research. *Journal of political economy*, *67*(3), 297-306.

Nelson, R. R. (Ed.). (1993). *National innovation systems: a comparative analysis*. Oxford University Press on Demand.

Nerlove, M., & Arrow, K. J. (1962). Extended advertising policy under dynamic conditions. *Economica*, 129-142.

Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. (1996). *Applied linear statistical models* (Vol. 4, p. 318). Chicago: Irwin.

North, D. C. (1993). Institutions and credible commitment. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, 11-23.

North, D. C. (1996, June). Institutions, organizations and market competition. In *keynote address to the Sixth Conference of the International Joseph Schumpeter Society, Stockholm* (pp. 2-5).

Nwabuzor, A. (2005). Corruption and development: new initiatives in economic openness and strengthened rule of law. *Journal of business ethics*, *59*(1-2), 121-138.

Nye, J. S. (1967). Corruption and political development: A cost-benefit analysis. *American political science review*, *61*(2), 417-427.

O'Driscoll Jr, G. P., & Hoskins, L. (2003). Property Rights. *Policy analysis*, *482*, 1-17.

OECD, (2005). OECD SME and Entrepreneurship Outlook: 2005, OECD Paris, page 17.

OECD, (1999). Policy Brief: Fostering Scientific and Technological Progress.

Oxford English Dictionary, (2009), Oxford University Press, retrieved from; http://www.oed.com/viewdictionaryentry/Entry/11125

Oliveira, T., & artins, M. F. (2011). Literature review of information technology adoption models at firm level. *Electronic Journal of Information Systems Evaluation*, *14*(1), 110.

Philp, M. (2016). Corruption Definition and Measurement. In *Measuring corruption* (pp. 61-72). Routledge.

Polinsky, A. M., & Shavell, S. (2000). The economic theory of public enforcement of law. *Journal of economic literature*, *38*(1), 45-76.

Porter, M. (1990) Have we lost faith in competition? Across the Board, September, 37±46.

Qian, Y., & Xu, C. (1998). Innovation and bureaucracy under soft and hard budget constraints. *The Review of Economic Studies*, *65*(1), 151-164.

Reinikka, R., & Svensson, J. (2004). Local capture: evidence from a central government transfer program in Uganda. *The quarterly journal of economics*, *119*(2), 679-705.

Robson, M. T. (1998). The rise in self-employment amongst UK males. *Small Business Economics, 10*, 199–212.

Rodriguez, P., Siegel, D.S., Hillman, A., Eden, L., (2006). Three lenses on the multinational enterprise: politics, corruption, and corporate social responsibility.

Rodrik, D. (2008). Second-best institutions. *American economic review*, *98*(2), 100-104.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of economic growth*, *9*(2), 131-165.

Rose-Acherman, S. 2001. "Trust, Honesty and Corruption: Reflection on the State-Building

Rose-Ackerman, S. (1997). The political economy of corruption. *Corruption and the global economy*, *31*, 60.

Rose-Ackerman, S. (1999). Political corruption and democracy. *Conn. J. Int'l L.*, *14*, 363.

Schroeder, M. A., Lander, J., & Levine-Silverman, S. (1990). Diagnosing and dealing with multicollinearity. *Western Journal of Nursing Research*, *12*(2), 175-187.

Schuetze, H. J. (2000). Taxes, economic conditions and recent trends in male self-employment: a Canada–US comparison. *Labour Economics*, *7*(5), 507-544.

Scott, W. R. (1987). The adolescence of institutional theory. *Administrative science quarterly*, 493-511.

Scott, W. R. (1987). The adolescence of institutional theory. *Administrative science quarterly*, 493-511.

Scott, W. Richard (1995). *Institutions and Organizations.* Thousand Oaks, CA: Sage.

Seldon, A. **(**1979)– Tax Avoision: The Economic, Legal and Moral Inter-Relationships between Avoidance and Evasion, *Institute of Economic Affairs*, London, 1979

Sequeira, S., & Djankov, S. (2010). An empirical study of corruption in ports.

Shabbir, G., & Anwar, M. (2008). *Determinants of cor- ruption in developing countries*. Retrieved from http: //www.pubchoicesoc.org/papers_2008/shabbir_anwar .pdf

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, *25*(1), 217-226.

Slemrod, J., & Yitzhaki, S. (2002). Tax avoidance, evasion, and administration. In *Handbook of public economics* (Vol. 3, pp. 1423-1470). Elsevier.

Sobel, R. S. (2008). Testing Baumol: Institutional quality and the productivity of entrepreneurship. *Journal of Business Venturing*, *23*(6), 641-655

Spiller, P. T. (1990). Politicians, Interest Groups, and Regulators: A Multiple-Principals Agency Theory of Regulation, or" Let Them Be Bribed". *The Journal of Law and Economics*, *33*(1), 65-101.

Stigler, G. J. (1971). The theory of economic regulation. *The Bell journal of economics and management science*, 3-21.

Subramanian, A., & Nilakanta, S. (1996). Organizational innovativeness: exploring the relationship between organizational determinants of innovation, types of innovations, and measures of organizational performance. *Omega*, *24*(6), 631-647.

Svensson, J. (2005). Eight questions about corruption. *Journal of economic perspectives*, *19*(3), 19-42.

Tanzi, V., & Davoodi, H. (1998). Corruption, public investment, and growth. In *The welfare state, public investment, and growth* (pp. 41-60). Springer, Tokyo.

Tarkowski, J. (1989). Old and New Patterns of Corruption in Poland and the USSR. *Telos*, *1989*(80), 51-62.

Teece, D. J. (1981). The market for know-how and the efficient international transfer of technology. *The Annals of the American Academy of Political and Social Science*, *458*(1), 81-96.

Teece, D. J. (1996). Firm organization, industrial structure, and technological innovation. *Journal of economic behavior & organization*, *31*(2), 193-224.

Tether, B. S. (1998). Small and large firms: sources of unequal innovations?. *Research Policy*, *27*(7), 725-745.

Tharenou, P., Saks, A. M., & Moore, C. (2007). A review and critique of research on training and organizational-level outcomes. *Human Resource Management Review*, *17*(3), 251-273.

Torgler, B. (2007). *Tax compliance and tax morale: A theoretical and empirical analysis*. Edward Elgar Publishing.

Tornatzky, L., & Fleischer, M. (1990). The process of technology innovation. *Lexington, MA: Lexington Books*.

Transparency International e.V. "2020 Strategy". *Retrieved from transparency.org.*

Treisman, D. (2000). The causes of corruption: a cross-national study. *Journal of public economics*, *76*(3), 399-457.

Tushman, M. L., & Romanelli, E. (1985). Organizational evolution: A metamorphosis model of convergence and reorientation. *Research in organizational behavior*.

UNCTAD (2009). *The Role of International Investment Agreements in Attracting Foreign Direct Investment to Developing Countries.* New York: United Nations.

Van Rijckeghem, C., & Weder, B. (2001). Sources of contagion: is it finance or trade?. *Journal of international Economics*, *54*(2), 293-308.

Van Rijckeghem, Caroline and Beatrice Weder, 2001 (2002). "Bureaucratic Corruption and the Root of Temptation: Do Wages in the Civil Service Affect Corruption, and by How Much?" *Journal of Development Economics*, Vol. 65, 307-331. Reprinted in G.T. Abed and S. Gupta (2002), 59-88.

Veracierto, M. (2008). Corruption and innovation. *Economic Perspectives*, *32*(1).

Weingast, B. R. (1995). The economic role of political institutions: Market-preserving federalism and economic development. *JL Econ. & Org.*, *11*, 1.

Process." *European Journal of Sociology*, 42: 526-570.

Znoj, H. (2009). Social structure and mobility in historical perspective. Sungai Tenang in highland Jambi.