

**CORRUPTION, INNOVATION AND FIRM PERFORMANCE:
GLOBAL EMPIRICAL ANALYSIS**

By

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SESSION 2015-2018

**THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS IN
PARTIAL FULFILLMENT OF REQUIREMENTS FOR THE DEGREE OF
Ph.D. IN ECONOMICS.**

DEPARTMENT OF ECONOMICS

The Islamia University of Bahawalpur

In The Name of Allah, the Most
Merciful and the Most
Beneficent

DECLARATION

I, Syed Muhammad Imran S/O Syed Muhammad Shah, a student of Ph.D. Economics, Department of Economics, The Islamia University of Bahawalpur hereby declare that the research work entitled **Corruption, Innovation and Firm Performance: Global Empirical Analysis** is done by me. I also certify that nothing has been incorporated in this research work without acknowledgment and that to the best of my knowledge and belief it does not contain any material previously published or written by any other person or any material previously submitted for a degree in any university where due reference is not made in the text.

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It is hereby certified that work presented by Syed Muhammad Imran in the thesis entitled **Corruption, Innovation and Firm Performance: Global Empirical Analysis** is based on the results of a research study conducted by the candidate under my supervision. No portion of this work has formerly been offered for a higher degree in this university or any other institute of learning, and to best of the author's knowledge, no material has been used in this thesis which is not his own work, except where due acknowledgment has been made. He has fulfilled all the requirements and is qualified to submit this thesis in partial fulfillment for the degree of Doctor of Philosophy in Economics at The Islamia University of Bahawalpur.

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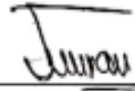


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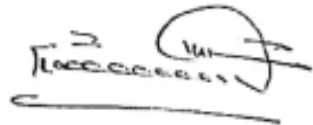
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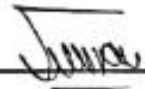
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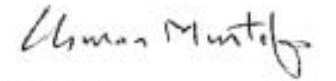
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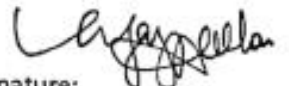
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TO

My Parents

Acknowledgment

All and every praise be to Allah Almighty, who guides us from darkness to light and helps us in difficulty. I am greatly thankful to my Allah Almighty and his last prophet Hazrat Muhammad (PBUH), whose blessings and grace enabled me to complete this study. I thank God for being healthy and motivated to work.

First of all, I express my profound gratitude to my supervisor Prof. Dr. Rana Ejaz Ali Khan, for guiding, supporting and motivating me during the doctoral studies. He really deserves a special appreciation for being more than a supervisor to me; supporting and advising me since my master's studies, continuously sharing his knowledge and encouraging me to work and pursue success. His comments and suggestions were always beneficial to shape my rudimentary ideas into a scientifically written manuscript. He guided me at each stage of my research, and I always found him ready while I need his help.

I am highly indebted to the support and concern of Dr. Zulfiqar Hyder (Economist, Research Department, State Bank of Pakistan, Karachi), Dr. Muhammad Kashif Ali Shah (Assistant Professor, Department of Statistics, Government College University, Lahore), Syed Aamir Ali Bokhari (Joint Director, Statistics and Data Warehouse Department, State Bank of Pakistan, Karachi).

I am equally thankful to Dr. Hafeez ur Rehman (Department of Economics, The Islamia University of Bahawalpur) for his support in research work and also in various administrative matters. I am pleased to express my thanks to all my Ph.D class fellows especially, Dr. Mariam Abbas Soharwardi. I am also thankful to Dr. Khalil Mudasir (Assistant Professor, Department of

Economics, Govt Sadiq Egerton College, Bahawalpur) and Mr. Syed Mumtaz Ali Kazmi for moral support.

I owe so much appreciation to Mr. Abid Hussain for their continuous and friendly support for helping me in achieving this mile's stone. I will always be thankful to all my colleagues and friends, who made my work easier and my life happier.

I am forever obliged to my family. To my mother who sacrificed everything for myself, who left this world before this final outcome of my academic career which was possible because of her aspirations and struggle, and I am very thankful to my father for prayers and financial support and for their endless support at every moment of my life. Special thanks to my both sisters Munazza Kashif and Sangeela Aamir for their concern and prayers. Words cannot express how much grateful I am to my wife, Anam, whose encouragements made my PhD work easier. She gave me full opportunity to focus on my research. My lovely daughters, Zainab and Wafa, provided me inspiration and energy by their smiles that helped me to complete my research work.

Syed Muhammad Imran

December 08, 2020

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ABBREVIATIONS

AIM	Asian Institute of Management
BEEPS	Business environment and enterprise performance survey
BUREAU	Bureaucratic Problems
CORRP	Corruption
CRIME	Crimes
DOMFIR	Domestic firm
EXAUDIT	External Audit
EXPORT	Exporting Firms
FAGE	Age of firm
FORFIRM	Foreign Firms
FSIZE	Firm size
INNOV	Product Innovation
LCON	License Constraint
LSALE	Real Sale
PLCOMP	Public Listed Company
MANEXP	Manager Experience
OLS	Ordinary Least Square
R&D	Research and Development
REGFIRM	Registered firm
SME	Small and Medium Enterprises
SWORK	Skilled Worker
TAX	Taxation
WBES	World Bank Enterprise Survey

ABSTRACT

Corruption is a worldwide phenomenon. Both developed and developing countries are facing this problem. It may be the politician who illegally uses his power to obtain undue favor by bending the law, or it may be in the form of informal payment to the local officer to “get things done.” It could be embezzlement by a public official or it could be a multinational organization that offers bribes to avail contract. It affects the country economically, politically and socially. It impedes growth, reduces investment, distorts government expenditures, increases inequality and poverty, decreases public trust in institutions and strengthens the size of the informal economy. Hence, what the consequences of corruption is primarily an empirical question. In this thesis, we firstly identified the factors that are responsible for firm level corruption and then we investigate the micro-level impact of corruption on firm performance and innovation in 147 economies using the data-set of World Bank’s Enterprise Survey. We have performed an empirical analysis of 147 countries in aggregate, as well as income and region-wise, disaggregated groups to quantify the impact of corruption on firm performance and firm level innovation. We have applied Ordinary Least Squares to find the impact of corruption on firm performance. Logistic regression model is applied on determinants of corruption and the impact of corruption on firm level innovation. Control variables such as bureaucratic problem, firm age, firm size, ownership of the firm, manager experience, external audit, and exports are used to cater to the problem of endogeneity. The results indicate that bureaucratic problem, taxation, and crimes increases the likelihood of corruption, while external audit, exports decrease the likelihood of corruption in aggregate as well as disaggregated analysis of income and regional groups. In the aggregate analysis, corruption increases firm performance, and in the income group, it increases firm performance in the case of low income economies. However, it increases firm performance in the case of High

Income economies. In regional groups, it has positive effect in Asia & Pacific, Europe & Central Asia, Middle East & North America and in South Asia and negative effects in Latin America & Caribbean, OECD and Sub-Saharan Africa. Results for firm level innovation indicate that in the case of high income and upper middle income countries, Asia & Pacific and OECD the corruption works as sand the wheel and in case of lower middle countries, Europe & Central Asia, Latin America & Caribbean and in South Asia, it works as grease the wheel. It is clear from the results that bureaucratic hurdle is the key factor for corruption. To reduce the probability of corruption and to increase firm performance, there is a greater need for good governance. Bureaucratic problem could be reduced through simplifying the procedure for obtaining license and permit and by allowing the firm to start its operation through less documentation and less interaction with public officials. The malfunctioning of public officials could be reduced by increasing the quality of the institution. The government should propagate information that corruption is the social and economic norm and encourage honest officials and firms by reward.

Keywords: Corruption, Innovation, Firm performance, Bureaucratic problem, Rent Seeking, External Audit

JEL: D73, O31, L25, D73, M42

Chapter 1

Introduction

Corruption and growth relationship has been broadly considered wonder in literature. The developmental experts consider corruption as one of the most widely recognized impediments to economic growth. In developing countries, corruption is quite a common problem. In macroeconomics, many economists and researchers have regressed the impact of corruption on growth by focusing on the misgovernance indicator. Evidences supported that corruption and growth are inversely associated with each other (Keefer & Knack, 1997; Li, Xu, & Zou, 2000; Mauro, 1995; Shleifer & Vishny, 1993)¹. The existing literature on corruption also supports the positive impact on economic development as it greases the wheels of business, which is very bewildering (Egger & Winner, 2005; Leff, 1964; Li et al., 2000; Lui, 1985)². The spread of corruption may vary significantly cross the nations. Nations with a greater degree of financial openness experience the ill effects of corruption as a deterrent of monetary development. The negative relationship nearly vanishes in nations that are less financially integrated. Mendoza, Lim, and Lopez (2015) found the positive impact of corruption for less developed economies; however, it ends up destructive to development when the economy is working at a higher level. Understanding corruption is not a simple task. An even more daunting assignment is to discover a remedy for corruption. However, Fisman & Svensson (2007) legitimately contend that macroeconomic analysis of corruption is a deficient method. By depending on total

¹ Corruption can impede growth and investment (Aidt, 2009; Brown et al., 2015; Butler, Fauver, & Mortal, 2009; Liu & Mikesell, 2014; Rose-Ackerman, 2004).

² Several recent papers have found evidence consistent with this argument. See (Fisman & Miguel, 2007; Persson et al., 2003).

macroeconomic measurements, it retains researchers of analyzing potential varieties of corruption in a nation nor does it permit to distinguish factors that influence the economy at micro-level like firm performance, production, exports, expansion and efficiency.

1.1 Firm level Corruption

The empirical literature on corruption in economics has seen a boom in the past decade³. The current literature has three attributes in common; it relies on cross-countries investigations; it illuminates information on corruption originated from perception indices and clarifies corruption as a part of nations' policy-institutional atmosphere⁴. These attributes are interlinked. The cross-cultural usage of data obviously lends itself to examine macro-determinants and consequences of corruption and the usage of perception data makes it possible to study a massive cross-section of nations. The literature has mentioned the critical drawbacks of aggregate determinants of corruption. Specifically, the usage of perception indices increases concern about understanding biases. Secondly, aggregate data tells little about the association between an individual agent and informal payments and most of all conceptually macro determinants can perhaps not satisfactorily explain the within-country version. Notably, businesses and different agents confronting similar policies and institutions could still wind up paying various levels in bribes. Bribery involves an illegitimate trade between government officials and other celebrities. It is beneficial for authorities to participate in bribery since they get financial incentives to compensate because of their relatively low income. Businesses, however, base their choice to take part in bribery on a benefit-cost analysis when considering the benefits and pitfalls. There

³ Sess for determinants the study of Ales and Di Tella (1999) on corruption. Also see, Persson, Tabellini, and Trebbi (2003), Treisman (2000), see Mauro (1995) and Wei and Kaufmann (1999) for consequences of corruption. See also Johnson, Kaufmann, McMillan, and Woodruff (2000).

⁴ For firm level impact of corruption see, Kaufmann, Montoriol-Garriga, and Recanatini (2008), Hellman, Jones, and Kaufmann (2003) used firm level data for 20 countries. Di Tella and Schargrotsky (2003) use micro level data to test the impact on wages. See also Becker and Stigler (1974).

are three major benefits for firms to bribe government officials. The first bribery has a beneficial impact on business productivity because of a decrease in bureaucratic impediments as a consequence of preferential treatment. Second, Méon and Weill (2010) assert that corruption may increase aggregate efficiency when a company is coping with weak institutions. Government institutions have control over the fund and raw material. It induces the firms for bribery because they depend on these very important assets. Third, companies believe they gain entry to manipulating markets, winning contracts and positive treatment. So, they bribe government officials. By paying bribes, companies aim to obtain a bigger market share that rewards their earnings. The hypothesis of “grease the wheel” suggests that corruption has a positive impact on firm performance. Several studies of (Fisman & Svensson, 2007; Méon & Sekkat, 2005; Zelekha & Sharabi, 2012) used Enterprise Survey data of the World Bank for different countries to examine the issue of corruption at the firm level. According to Lui (1985) and Leff (1964), corruption increases productivity and efficiency. Countries with weaker institutions have more inefficient government officials due to a lack of incentives. In such a situation, informal payments and gifts provide incentives to bureaucracy to speed up work and the decision-making processes (Lui, 1985). Low paid government officials consider bribes as perk (Spicer, Dunfee, & Bailey, 2004). Beck and Maher (1986) argue that bureaucracy awards projects and license to those firms that offer relatively more bribes. So, corruption and bureaucracy both are positively associated with firm growth and efficiency.

On the other hand, corruption harms firm performance. According to Rose-Ackerman (2004) corruption negatively affects efficiency, growth and investment. Corrupt bureaucrats delay the registration process (Myrdal, 1968). Firm level studies also concluded that corruption reduces investment and suppresses output (Fisman and Svensson, 2007; Asiedu and Freeman, 2009), decreases

public investment (Tanzi & Davoodi, 1998), productivity and transfer of technology (Salinas-Jiménez & Salinas-Jiménez, 2007). The current study will see the impact of corruption on firm performance and innovation for global economies as aggregate and the disaggregated by income and region.

Table 1.1: Current Status of Corruption in World Economies⁵

Top 10 Most Corrupt Nations			Top 10 Least Corrupt Nations		
Country	Region	Score	Country	Region	Score
Somalia	Sub-Saharan Africa	10	Denmark	Western Europe & European Union	88
Syria	Middle East & Africa	13	New Zealand	Asia Pacific	87
South Sudan	Sub-Saharan Africa	13	Switzerland	Western Europe & European Union	85
Yemen	Middle East & Africa	14	Sweden	Western Europe & European Union	85
Korea, North	Asia Pacific	14	Singapore	Asia Pacific	85
Sudan	Sub-Saharan Africa	16	Finland	Western Europe & European Union	85
Guinea Bissau	Sub-Saharan Africa	16	Norway	Western Europe & European Union	84
Equatorial Guinea	Sub-Saharan Africa	16	Netherlands	Western Europe & European Union	82
Afghanistan	Asia Pacific	16	Luxembourg	Western Europe & European Union	81
Libya	Middle East & North	17	Canada	Americas	81

Source: Transparency International (2018).

⁵ Transparency International uses a scale from 0 to 100. 100 is least corrupt and 0 is highly corrupt. More than 2/3 of countries score below 50. The average country score is 43. Western Europe & European Union has highest scoring region with a score of 66. Sub-Saharan Africa is the lowest scoring region with a score of 32.

Table 1.2: Firms' Informal Payment to Public Official as Percentage of Total Sale

Income Group		Regional Group	
Economies	Percentage	Economies	Percentage
High Income	10.44	Asia and Pacific	31.85
Upper Middle Income	12.82	Europe and Central Asia	13.67
Lower Middle Income	20.80	Latin America and Caribbean	8.08
Low Income	26.13	Middle East and North Africa	16.33
		OECD	7.60
		South Asian	17.94
		Sub-Saharan Africa	21.63

Source: World Enterprise Survey (2013)

Table 1.2 shows the average amount of bribery paid by firms in different income and regional groups. The firms in high income nations paid 10.44 percent of its total annual sales as bribery. The firms in upper middle nations, lower middle nations and low income nations paid 12.82, 20.80 and 26.13 percent of its total annual sales as bribery respectively. Table 1.2 describes that as the level of income decreased percentage of bribes payments increases. So it is concluded that high income nations pay less bribes and low income pays high bribes. Similarly the firms in OECD nations pay less bribes. The reason for low bribes in this region is that it includes all the high income nations. The firms in Asia and Pacific and Sub-Saharan Africa jointly pay 53.48 percent of their total sales as bribes. The firms in these two regions pay almost more than fifty percent of their sales as bribes. The reason for high level of bribery is that firms in these regions belong to either low income or lower middle income nation.

1.2 Innovation

Innovation expresses the process of change or the transformation of knowledge, ideas, and inventions into commercially viable goods, services, or processes. It has evolved throughout history through its analysis in the economics literature implicitly argued that innovation drives growth (Santos, Basso, Kimura, & Kayo, 2014). The more explicit analysis of innovation, its

definition, and the economic role were provided by (Schumpeter, 1939). Overall, innovation is considered to be a driver of economic growth, firm performance and exporting activities. As such, it has become an attractive field of research. The process of innovation may be as old as humanity as it represents the dynamic and systematic advancement of products, processes and organizational work methods of all kinds. In the specific context of firm innovation, the literature on innovation widely accepts the work of Schumpeter (1934) as the pioneering contribution in the field. Firms engage in innovation in order to increase their productivity, competitiveness, and market share which ultimately increases their profits (Love & Roper, 2015).

Various theories on innovation and firm performance have evolved since the time of Schumpeter (1934). Love and Roper (2015) following the technology gap theory, investigated the relationship between innovation and export of the firm. They suggested that there is a strong positive association between the two variables. They further added that innovating exporters are better performers⁶ in general. Lo Turco and Maggioni (2015) argued that innovation is highly important in preserving a firm's competitive position in export markets. Using Tobit and Probit models, Wakelin (1998) and Sterlacchini (1999) found that exporting firms in the UK and Italy, respectively, are more likely to innovate as compared to non-exporting firms, while they suggest a weak effect of export on innovation. Wakelin measured innovation⁷ output by the number of innovation types, whereas Sterlacchini (1999) used proxy indicators of innovation such as the newly introduced goods and services and share of pre-production development expenditure in turnover. Following the approach of Wakelin (1998), Sterlacchini (1999) and Love and Roper

⁶ Earlier studies, investigating a univariate relationship of innovation and exporting activities, of Hirsch and Bijaoui (1985) for Israel, and Kumar and Siddharthan (1994) for India suggested a positive and significant impact of firms' export intensity on R&D intensity.

⁷ In a more recent study, Bertarelli and Lodi (2015) measured innovation through four different ways, product, process, organizational and marketing).

(2015) suggested that both the propensity to export and export intensity for a sample of plants in the UK and Germany has a positive effect on product innovation. They found a significant effect of export on product innovation for Germany only. Other authors also found the same (Cassiman, Golovko, & Martínez-Ros, 2010; Leonidou, Katsikeas, Palihawadana, & Spyropoulou, 2007; Monreal-Pérez, Aragón-Sánchez, & Sánchez-Marín, 2012; Wagner, 2007).

Table 1.3: Current Status of Innovation⁸ in World Economies

Top 10 Most Innovative Nations			Top 10 Least Innovative Nation		
Country	Income Group	Score	Country	Income Group	Score
Switzerland	High Income	67.24	Yemen	Low Income	14.49
Sweden	High Income	63.65	Burundi	Low Income	17.65
United States of America	High Income	61.73	Niger	Low Income	18.13
Netherlands	High Income	61.44	Togo	Low Income	18.54
United Kingdom	High Income	61.30	Guinea	Low Income	19.50
Finland	High Income	59.83	Zambia	Lower Middle Income	20.36
Denmark	High Income	58.44	Benin	Low Income	20.42
Singapore	High Income	58.37	Zimbabwe	Low Income	22.30
Germany	High Income	58.19	Madagascar	Low Income	22.38
Israel	High Income	57.43	Nicaragua	Lower Middle Income	22.55

Source: Global Innovation Index (2019).

1.3 Firm Performance

The firm performance is an intricate term that might consist of unique shadows of significance provided that it pertains to organizational performance, working of the company, and results of its operations. Ordinarily, the firm performance implies the organizational operation, including the production of services and products, working of unique units of the company, functionality and productivity of its workers. At precisely the same time, the business performance could be

⁸ Global Innovation Index uses a scale from 0 to 100. 0 is least innovative nations and 100 is highly innovative nation.

looked at in a wider context for a part of the business growth of the company. What is intended here is a simple fact that the company development mirrors the business's performance and permits to evaluate the degree to which the organizational performance is successful. Now, it is crucial to emphasize how firm performance is essentially measured concerning the efficiency of their business's operations. In reality, the more successfully the company's operations are finished the more optimistic the firm performance is; alternatively, the very low efficiency of business operations and workers' performance usually means inadequate firm performance. Within this regard, workers' performance features an essential component of the business's performance.

Also, it is very important to consider that firm performance is a significant factor for analysts and investors. What is intended here is a simple fact that the firm performance indicates if the company is well worth investing or not. For example, investors are prepared to spend in businesses with optimistic marketing and advertising operation, whereas inferior advertising and marketing performance suggests the issues companies have in their small business development. Because of this, investors prevent investing in firms with bad performance as they are unsure of the yield on investments and due to high risks associated with these investments.

A measure of firm performance might not only is based upon the efficiency of the business but also in the marketplace where it works. In the financial sector, it is also called monetary stability or fiscal wellbeing. There are various financial measures that may be utilized to be able to assess the operation of an organization. Based on the business where the company functions, a few financial ratios are more meaningful than many others. For example, in the manufacturing sector, overall sales, return on assets and stock turnover might be crucial to examine. Faruq, Webb, and

Yi (2013) believed that the investments⁹ and efficacy are the measures of company performance. Firm sales growth might be appropriate in gauging business performance.

1.4 Research Question

Corruption is not a new subject, but it has become a central issue across the world. It is thought to be a substantial source of corrosive consequences that interrupts the stability of societies, interrupts democratic and ethical principles, also hampers economic growth (Mauro, 1995). Virtually all nations believe corruption a criminal action, and lots of international organizations have tried to restrict corruption (Spicer, Dunfee, and Bailey, 2004). Many nations have started anti-corruption campaigns to get rid of corruption. According to Transparency International (2015), corruption is deemed uncontrolled in over 70 nations. The World Bank report that corruption costs \$1 trillion annually (Kaufmann, 2005). Economists considers corruption the result of the absence of transparent institution and inadequate quality of public services (Treisman, 2000; Wu, 2009) Though the empirical literature about corruption and economic performance at the national level has been comparatively well established and based upon the ethical decision-making theories and principal-agent models that describe bribery from the point of view of the agent receiving the bribe (i.e., the demand side of bribery) and grand corruption (i.e., corruption which involves a considerable sum of money and high-level officials), the association between bribery and performance at the firm level, that based on agents paying bribes and petty corruption (i.e., corruption involving small quantities of cash to lower-level officials), is under addressed. This type of firm level perspective could be rewarding, as it permits for new questions linked to the antecedents and consequences of corruption at the firm

⁹ Gyimah-Brempong (2002) for African American and Latin American companies considers investments in fixed assets as measure of firm performance. See also study of O'Toole & Tarp (2014).

level. Despite considerable progress on the research on corruption, it is not yet completely understood what are the determinants and consequences of corruption for different income groups and in different region of the world. The intention of this thesis is to complement present corruption research and improve understanding of the determinants and effects of firm level corruption in aggregate as well as to provide the income and region wise disaggregated analysis of the global economies. The principal research questions which current study addresses are: What are the determinants of firm level corruption? What is the impact of corruption on firm performance and on the firm level innovation?

1.4 Objective of the Study

Followings are the main objectives of this study

1. To estimate the determinants of corruption at firm level in a panel of global economies, global income groups, and global regional groups.
2. To estimate the impact of corruption on firm performance in a panel of global economies, global income groups, and global regional groups.
3. To estimate the impact of corruption and on firm level innovation in a panel of global economies, global income groups, and global regional groups.

1.5 Hypothesis

Hypothesis No. 1

There is no relationship between corruption and firm-specific characteristics.

Hypothesis No. 2

Corruption works as sand the wheel for firm performance.

Hypothesis No. 3

Corruption works as sand the wheel for firm level innovation.

1.6 Scope of the Study

Almost all the nations globally reported a remarkable growth rate in the last half-century. The annual growth rate in countries like South Korea, Taiwan, China, Malaysia, and Vietnam is on average 8 percent (Lau & Park, 2003; Wu, 2009). On the other hand, Transparency International rated many Asian nations having the greatest rates of corruption (Wu, 2009). This may be denoted a paradox as it has widely considered that corruption inhibits economic development and reduces investment (Burki & Perry, 1998; Mauro, 1995), distorts competition (Hamra, 2000), raises income inequality (Li et al., 2000), and reduces foreign trade and human capital (Friedman, Johnson, Kaufmann, & Zoido-Lobaton, 2000). Many Asian nations have gone through anti-bribery campaigns and signed global anti-corruption agreements. Nonetheless, regardless of the strong efforts of the governments to restrict corruption, the incidence of corruption continues to exist (Friedman et al., 2000). Not only developing and emerging economies, but developed nations are also facing more or less the same consequences of corruption. The current study will avail the opportunity to examine the key factors of bribery at the firm level for a panel of global economies. The income and regional groups of the economies will also be analyzed for the same purpose. Although the determinants of corruption vary for individual economies, but it is out of the scope of the current study. On the same lines the impact of corruption on firm performance and innovation will be analyzed. While the effect of corruption on productivity, exports, and capacity utilization is out of the scope of the study.

1.7 Significance of the Study

This study can contribute to academic and practical areas of the topic for various reasons. It shed light on the factors that contribute to corruption and the consequences of firm level corruption.

The finding of this study may provide an overall discussion on the factor of corruption at the firm level and its impact on firm performance and innovation. On the basis of the results the proposal for policy formulation will be framed. This work will also provides the researcher with an extensive foundation to start further research with different data sets and various economies. It will further propose remedial policies for different income and regional groups of the nations to combat corruption.

1.8 Organization of the Study

Chapter one provides an introduction to the corruption at the firm level, innovation and firms' performance. It also discusses the objectives and hypotheses of the study. Chapter two explores the literature on determinants of corruption, on the relationship between corruption and firm performance and the impact of corruption on firm level innovation. Chapter three provides a theoretical framework that consists of definition and type of corruption, macro and micro-level determinants of corruption, the effect of corruption on firm performance and innovation. Chapter four provides information regarding data and methodology. This chapter provides a functional relationship for the determinants of firm level corruption, the effect of corruption on firm performance and innovation. Chapter five provide the results and discussion on the determinants of firm level corruption in a panel of global economies, a disaggregated panel by income and regions. Chapter six provides the results and discussion on the effect of corruption on firm performance in a panel of global economies, as well as disaggregated results of income and regional groups of economies. Chapter 7 provides the results and discussion on the effect of corruption on firm level innovation in a panel of global economies as well as disaggregated results of income and regional groups of economies. Chapter 8 provides conclusion and policy recommendation.

Chapter 2

Literature Review

The main focus of the current study is to identify the factors responsible for firm level corruption, and to see the effect of corruption on firm performance and innovation. As the study has three parts, this chapter explores the existing literature on determinants of firm level corruption, the effect of corruption on firm performance and the effect of corruption on innovation. The national and international literature is reviewed here.

2.1 Determinants of Firm level Corruption

The literature has identified a large number of determinants of corruption at the firm level. They include managers' relationships with the public official (Collins, Uhlenbruck, and Rodriguez, 2009). Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002) argued that countries with stricter regulations of entry tend to be associated with higher corruption. They concluded that the strict regulations of entry produce a "double benefit" for incumbent firms via increased revenues and lower competition.

Sanyal (2005) estimated the determinants of corruption using perception base data from transparency international. Taking and giving bribes in most nations is quite common practice. Since government officials control the supply of valuable benefits as well as the imposition of cost, so the private people and companies that need favorable treatment could be eager to cover them. Bribery occurs when prohibited obligations are made into the representatives of the state to obtain benefits. The study identified that taxes, regulation and custom duties are significant economic factors that influence bribery. The cultural and social factor is also responsible for corruption.

Wu (2009) explored the determinants of bribery in Asian firms. The study employed ordered Probit and interval regression models. They found that bureaucracy, taxes, and the judiciary has a significant impact on bribes. The results indicated that most Asian firms are involved in corrupt practices. Corruption is institutionalized, and firms are willingly paying the informal payments to get the goods and services in reward of bribe payments. It is due to supply-side anti-corruption policies in Asian countries. The study suggested that there should be demand and supply-side anti-corruption policies. The government, individuals, and community all have to play their role in reducing corruption.

Collins, Uhlenbruck, and Rodriguez (2009) investigated the causes of firm level corruption in India. In this paper, survey data has been used, that was collected through a semi-structured interview. The sample size of this paper was 341. They employed OLS and factor analysis for model estimation. The results showed that managers were engaged in corrupt practices with public officials to get benefits and being competitive. Managers' relationship with public officials, ignoring the laws regarding corruption, membership in political parties and support for political activities are major determinants of corruption in India. The study suggested that these factors should be controlled to eliminate corruption.

Dong and Torgler (2013) estimated the determinants of corruption in China. They used Chinese province-level data from 1998 to 2007. They employed the fixed effect model instrumental variable technique and pooled OLS for the estimation. The study found that social diversity, regulation, and an abundance of resources promote corruption, while fiscal decentralization reduces corruption. They found the positive correlation between economic growth and corruption which is due to the transition stage of the market and economy.

Pelizzo, Araral, Pak, and Xun (2016) investigated the causes of bribery in Sub Saharan Africa. The study used the dataset from the World Enterprise Survey, which included the fourth wave of dataset 2009-2013. An Enterprise Survey provides detailed information about firms. This study employed the Probit regression model to estimate the relationship between firm bribe payment and other factors of bribery. The study concluded that bribe payments depend on the characteristics of firms. Second, the size of the firm was an important determinant of bribe payment. Thirdly, bribery by African firms was more sensitive to contextual factors than firm characteristics. The study suggested that the determinants of corruption were different in different regions. There should be different anti-corruption measures for different regions.

Bai, Jayachandran, Malesky, and Olken (2017) estimated that whether firm growth reduced corruption in Vietnam and China. They utilized the firm level data, Vietnam PCI survey, and the annual Enterprise Survey collected by the GSO, and they also utilize the data from the China Statistical labor yearbook. They employed the ordinary least square (OLS) to estimate the effect of firm growth on corruption. The results of the study showed that industry-level growth reduces bribery. The reduction in bribery is for a larger firm. The results also provided an understanding of the determinants of corruption in developing countries. Overall economic growth reduced corruption.

Farooq and Shehata (2018) investigated the effect of firms' external audit on corruption. The study consisted of a total sample of 50000 firms in 126 countries obtained through the World Bank Enterprise Survey from 2006 to 2014. The study employed the ordinary least square to estimates the causes of corruption. The results of the study showed that the firm with the external audit is less corrupt than the firms without external financial audit. This study provided

important policy measures for developing nations. The study suggested that annual external audits for firms should be mandatory to reduce corruption.

Cariolle (2018) investigated the consequence of corruption from a growth perspective. The study employed the World Bank Enterprise Survey of 34358 firms from 71 countries by employing the logistic regression model and ordinary least square. The results of the study showed that state regulation has strong effects on corruption; higher tax revenues are negatively associated with corruption. State intervention partly affected trade openness. The study suggested that the importance of government intervention should be increased to reduce the bribery in developing and transition countries.

Mbate (2018) developed the framework regarding the determinants of bribe payments when bureaucrats interact with the public. This study employed logistic regression models and the linear probability model on the data from the Afro- barometer survey conducted in 2011 and 2012. The result of the study showed that the burden of bribery falls on the poor. The poor pay informal payments more than the rich that increases the poverty bribery trap. The reason for this is that because rich have the option from the private sector to seek the service. The results also indicated that social institutions reduced corruption and political organization increased corruption. The study suggested that anti-corruption reforms with poverty reduction reforms through empowering the poor and increasing the income of the poor can reduce the phenomenon of corruption.

Zare Mehrjerdi and Saghaian (2019) estimated the determinants of corruption in developing nations. They utilized the WBES, which consists of 130000 enterprises in 135 developing and transition countries. The study employed the ordinary least squares regression model. The results of the study indicated that the quality of the legal system is the major determinants of corruption.

Access to finance and sales growth reduced corruption. Firm size also reduced the likelihood of corruption.

2.2 Corruption and Firms' Performance: Sand the Wheel

Much of the recent literature suggested that corruption is inefficient and acts more like “sand in the wheels.” In his seminal study, Mauro (1995) finds that corruption is negatively associated with investment and per capita GDP growth. Some of the other studies (Keefer & Knack, 1997; Shleifer & Vishny, 1993) corroborated these findings. Corruption is also associated with lower foreign investment (Gray, Hellman, & Ryterman, 2004; Wei & Kaufmann, 1999). Tanzi and Davoodi (1998) showed that even when corruption is associated with higher public spending, the spending occurs for low-productivity projects at the expense of high productivity projects. Galang (2012) investigated that corruption has a “corrosive” impact on the global economy. Corruption adds uncertainty and risk which reduces firm performance (Galang, 2012; Shleifer & Vishny, 1993). Baumol (1990) found that the poor quality of an institution divert resources from productive to unproductive activities.

Habib and Zurawicki (2002) suggested that corruption as an important hurdle for investment. Corruption is inversely related to FDI, and firms typically do not support the idea of entering into a corrupt environment. They also found that the negative effect is strongest when the distance between the corruption of the host country and the foreign firm is large.

Fisman and Svensson (2007) explored the relationship between bribe payment, taxes, and firm growth throughout 1995-1997. They used the data set from the Ugandan Industrial Enterprise

Survey by the World Bank. The data was collected from 243 firms. The results of the study showed that tax rate and corruption were negatively correlated with firm growth. The increase in tax rate reduced the firm annual growth rate. The 1 % increase in bribes payment reduced the 3.3 percent reduction in firm annual growth rate¹⁰. The study concluded that the negative relationship between the bribe rate and firm growth was much more harmful than the tax rate. The study suggested that community and other organizations should focus on reducing corruption.

Zhou and Peng (2011) explored the relationship between corruption and firm growth on a worldwide basis. They utilized the data set from the WBES by the World Bank. The sample consists of 2686 firms from 48 countries. They used the Hierarchical Linear Model (HLM) for model estimation. They also used the generalized two-stage least squares (G2SLS). The results of the study showed that corruption harmed firm growth in the case of a small firm, but not on large firms. The study also found that market failure, weak institution framework, and policy uncertainty increase the firm's corruption.

Rand and Tarp (2012) investigated the relationship between the potential bribe determinants and the chance of providing informal payments. They used the data of two SMEs survey consisted of 1659 SMEs in 10 provinces of Vietnam in 2005 and 2007. They employed the pooled probit and fixed-effect models. The results showed that corruption among SMEs in Vietnam is very closely correlated with firm level differences in sunk cost and the ability to pay. Secondly, bribe payments were high for tax evasion and to get the benefit for government contracts. Thirdly, the

¹⁰ Baumol (1990) pointed out, when firms face corrupt environments, they may engage in unproductive behavior. Serra (2006) found that firms which operate in corrupt political districts lobby more in order to minimize the harm caused by corruption.

payment of the bribe decreased government regulation¹¹. The study suggested that anti-corruption government action should be taken, increase political commitment to implement law and order situation, and media focus on punishment against bribes payment.

Brown, Smith, White, and Zutter (2015) suggested that corruption might also lead to entrenchment at the corporate level and imposed substantial agency costs upon the firm's shareholders. They found that firms with strong governance were particularly vulnerable to corruption. In their views, a corrupt political environment is an evidence of poor quality institutions.

De Rosa, Gooroochurn, and Görg (2015) evaluated the effects of corruption on productivity and they also discussed the causal effect of corruption. They utilized the data set of WBES. For estimation purposes, they used the one-step augmented production function, instrumental variable approach, and OLS techniques. The results showed that corruption has negative consequences on firm performance. The corruption also has a negative impact on economic growth. The study suggested that to reduce corruption, targeted wages should increase for government officials. Institutional reforms should be also necessary for corruption remedy.

Sharma and Mitra (2015) tested the impact of bribe payment on firms' performance for Indian enterprises by using World Bank Enterprise survey data. They considered 37 Indian cities across 22 industries to investigate the impact of corruption and governance on firms' performance. They tested grease the wheel hypothesis by considering two sets of variables that included government-related indicators such as bureaucratic complexity, different policy obstacles related to custom and trade regulations, tax administration, labor regulations and firm-specific

¹¹ It has been associated with weak governments (Shleifer & Vishny, 1993) and slower macro-economic growth (Aidt, 2003; Mauro, 1995). Moreover, it adds uncertainty and risk for companies that enter corrupt environments (Galang, 2012; Shleifer & Vishny, 1993).

characteristics such as firm size, innovation, international exposure, and competition, firm ownership, and age. They used ordinary least square to measure firms' performance and concluded that corruption reduces profitability, technical efficiency, and labor productivity while it increases export performance. Firm-specific variables turn to be statistically insignificant in case of firms' profitability.

Beltrán (2016) investigated the relationship between corruption and employment in firms. The study utilized the firm level surveys of the private sector. The sample of the study consists of 14200 firms from 28 countries of Latin America and the Caribbean. The study employed the ordinary least squares to pooled firm level data. The main variable was the total annual sales paid in bribes. The results of the study showed that corruption and employment are negatively correlated. Corruption reduced employment in firms.

Goedhuys, Mohnen, and Taha (2016) estimated the nexuses between corruption and growth. They tested the hypothesis of "grease the wheel" using firm level survey data of Egypt and Tunisia. The total number of firms included in the sample was 3489, out of which 592 from Tunisia and 2897 firms from Egypt. They used Logistic regression and ordinary least square (OLS) techniques for estimation. The results of the study showed that there is no significant effect of corruption on innovation. Corruption has a direct negative impact on firm growth. The study suggested that policymakers should take serious measures against corruption by eliminating the different institutional hurdles and barrier which cause corruption.

Colonnelli and Prem (2017) investigated the impact of corruption on resource allocation, firm performance and local economy in Brazil. They used data from the Brazilian formal sector. They employed the non-parametric and parametric event study models for estimation. The results of

the study showed that corruption retards firm performance¹². Furthermore, the study provided the implication for various firm level theories of corruption. Corruption and favoritism impose a higher cost on the connected firm. They suggested that anti-corruption initiatives must be taken to avoid the unfavorable effect of corruption.

Bbaale and Okumu (2018) investigated the link between corruption and firm level productivity. They utilized the World Enterprise Survey (WES) data set by the World Bank by employing the instrumental variable approach, augmented Cobb-Douglas production function and ordinary least square to test the impact of corruption on firm level productivity. The results of the study showed that corruption negatively impacts firm productivity. The study suggested that the government should propagate the information that corruption is not productivity-enhancing.

2.3 Corruption and Firms' Performance: Grease the Wheel

Grease the wheel hypothesis is supported by a larger number of studies at firm level (Blagojević & Damijan, 2013; Leff, 1964; Mendoza et al., 2015; Sahakyan & Stiegert, 2012; Wang & You, 2012). Leff (1964) suggested that corruption can actually circumvent regulations, by introducing policies that would otherwise been unavailable. This line of argument is based on the notion of “speed money” or bribes, which may allow some to navigate through bureaucratic red tape¹³ quickly. Sahakyan and Stiegert (2012) evaluated the effects of corruption on firm performance in America. They used the data of ABS survey which consists of 400 enterprises. They used the bivariate Probit regression model for the estimation purpose. The study concluded that less

¹² Corrupt environments often raise transaction costs since they are often associated with the employment of brokers, middlemen and local partners in order to complete deals (Lambsdorff, 2002). Corruption can therefore raise the barrier to entry and exit in markets (Habib & Zurawicki, 2002; Rose-Ackerman, 2004).

¹³ corruption may allow easy navigation through bureaucratic red tape via bribes, which may allow some to more easily navigate through bureaucracy (Leff, 1964).

competitive and large firms take benefit from corruption. In the case of competitive and small firms corruption has a negative impact on firm performance. They suggested that social investment may assist the government to reduce corruption.

Wang and You (2012) investigated the effects of corruption on firm growth in China and also discussed the relationship between financial development and firm growth. They used the data from the Investment Climate Survey by the National Bureau of Statistics of China. The data was collected from 12400 firms and 31 industries in 30 provinces of China. The firm growth was measured through sales income, profits, employment, and investment. Results indicated that access to finance as well as corruption has a positive impact on firm growth due to imperfection in the Chinese capital market. The positive relationship between corruption and firm growth was due to the transitional stage and due to the small size of firms. The study explained that the positive relationship between corruption and firm growth will be temporary. For long term and sustainable growth of the firm, there is a need for institutional reforms.

Blagojević and Damijan (2013) investigated the effect of business environment and corruption on firm performance. They utilized the data set of the Business Environment and Enterprise Performance Survey for the years 2002, 2005 and 2009, for Central and Eastern Europe. They employed the standard growth accounting model and fixed effect estimators. The results showed that larger firms offer more bribes and get more reward. Weak and unstable business environments had inverse impact on firm. The study suggested the transparent and strong business environment and institutional structure that reduce corrupt practices. The study also suggested that anti-corruption policies and government regulations may help to reduce firms' corrupt practices.

Ayaydın and Hayaloglu (2014) estimated the effect of corruption on firm in Turkey.¹⁴ They employed the data set of manufacturing firms from public disclosure platform and Istanbul stock exchange. They employed static panel techniques like random effect models. The results showed that corruption plays a significant role in firm growth. Corruption increases firm growth due to market failure.

Jiang and Nie (2014) explored the relationship between corruption and firm performance through firm level panel data analysis. They used the data set of Chinese industrial enterprise from 1999-2007, which covered the all state-owned and non-state-owned enterprises. They used the fixed effect models to find the effect of corruption on firm performance. They concluded that corruption does not affect all firms uniformly. Corruption was positively associated with the profit of private firms as well as it was negatively associated with the profit of publicly owned firms. They suggested that there was a need for government regulation to reduce corruption.

Mendoza, Lim, and Lopez (2015) empirically analyzed that corruption had adverse impact on the firm. The total 2040 small, medium and SMEs were included in the survey. Simple ordinary least square (OLS) was used to estimate the parameters. The results showed that there was a positive association between corruption and sale growth. Bribing the public official grease, the wheel of commerce in the Philippines. The study suggested the use of anti-corruption measures and proper government regulation for the control of corruption.

Hanousek and Kochanova (2016) explored the relationship between bureaucratic corruption and firm performance in Central and Eastern European countries. They utilized the data set from the

¹⁴ Egger and Winner (2005) showed positive impact of corruption on FDI and supported the “greased wheel” hypothesis of corruption.

Business Environment and Enterprise Performance Survey of the World Bank. They used three waves of data 2002, 2005 and 2008. They employed the typical growth equation for the model estimation. The growth rate was taken as the dependent variable. The results showed that bribery reduces firm performance. The results also showed that the firms are more productive in production and growth which are non-bribing, and some bribing firms get preferential treatment from government officials.

Williams and Kedir (2016) evaluated the effects of corruption on firm performance in African countries. They used the data from the World Bank Enterprise Survey for 40 African countries. They used a pooled OLS regression model for estimation. The results showed that corruption promotes the annual sale, employment, and productivity. They found that gift and informal payments increase firm performance. This was due to market failure and institutional weakness. Overall, corruption was harmful to the country and economic growth. It should be eliminated by anti-corruption measures.

Williams, Martinez-Perez, and Kedir (2016) investigated the negative impact of bribery on firm performance. They utilized the data set of World Bank Enterprise Survey on 106805 firms of 132 developing nations. They employed the panel regression for estimating the effect of corruption on firm performance in developing countries. The results showed that corruption increases firm performance in developing nations. Because they believed that gifts and bribe payments to government officials increased the firm annual sales of the firms. The study concluded that bribery promotes firm sales was due to institutional deficiencies. They suggested that measures should be taken to eliminate these procedural hurdles that cause corruption.

Demenet, Ho, and Morcillo (2017) investigated the impact of corruption keeping in view the institutional aspect. They used the survey data of Vietnam manufacturing SMEs. The survey was

conducted in 2015 consisting of 2647 enterprises in 10 out of the provinces of Vietnam. The estimation technique was OLS and the results showed that corruption was beneficial for the growth of firms due to the weak institutional framework and corruption found to be positively correlated with large firm size. They concluded that bribery works as “grease the wheel.”

2.4 Corruption and Firms’ Innovation

A number of studies have attempted to see the impact of corruption on firms’ innovation (Anokhin & Schulze, 2009a; Boermans, 2013; Golla, 2010). Salomon and Shaver (2005) found that Spanish exporters increased their patent applications and product innovation after exporting, but this was more pronounced with lags of two years after exporting¹⁵. The results indicated that corruption had a significant positive influence on the innovativeness of the firms (Boermans, 2013). Anokhin and Schulze (2009) investigated the impact of political-economic corruption on entrepreneurs and innovation. They used the data set from multiple sources; World Bank's World Development Indicators (WDI), Global Entrepreneurship Monitor (GEM), World Governance Indicators (WGI) of 64 nations to test the relationship between corruption and innovation and entrepreneurial ability. They applied the Data Envelopment Analysis (DEA) for data analysis. The results indicated that there was a positive association between corruption and innovation and entrepreneurial activity. The study suggested the institutional reforms to combat corruption.

Golla (2010) investigated the relationship between corruption and innovation in emerging economies of post-communist EU member states. The study used the data from Transparency International and European Innovation Scoreboard. The results explained that there is a strong

¹⁵ Similarly, Damijan, Kostevc, and Polanec (2010) suggested that exporting does not encourage firms in transition economies to become first time innovators. In contrast, Baldwin and Gu (2004) found no impact of exporting on innovation for Canadian firms.

relationship between corruption innovation. Corruption had a significant and negative impact on innovation in new member states. However, in the Mediterranean states, there is a high level of corruption which caused a reduction in innovation. The study suggested that policies may be adopted to combat corruption and improve innovation.

Baldwin and Gu (2004) investigated the effect of corruption on firm level innovation. The study found the correlation between innovation and investment in research and development of firms. The study used the two waves of data set derived from World Bank BEEP for 27 Eastern European and Central Asian countries. The data consisted of 6667 firms in 2002 and 9655 firms in 2005 surveys. The study employed the Logit and Tobit models for estimation. The results found that the bribe payments improve the innovation and there was a positive correlation between corruption and firm level innovation, which proved the hypothesis that corruption greases the wheels of innovation.

Boermans (2013) investigated the export destination effect which found that firms exporting to countries outside Africa become more capital intensive than exporters within the African region as a less developed economy¹⁶. Also, Van Beveren and Vandebussche (2010) for Belgium and Lamotte and Colovic (2013) for transition economies found an insignificant relationship between exporting activities of the firm on the likelihood of engaging in innovation.

Gashi (2014) found the causality of innovation and discovered that innovating SMEs in transition economies firms having introduced at least one type of innovation are associated with higher export intensity compared to non-innovators. Similarly, Lewandowska, Szymura-Tyc, and Gołębowski (2016) suggested that the firms conducting both product and process innovation

¹⁶ Similarly, Jaffe (1986) found that Japanese exporters to North America and Europe are more innovative than exporters to Asia as a less developed market.

experience higher export intensity of new products. Although the reviewed studies acknowledged the issue of endogeneity, they generally investigated a univariate relationship between innovation and export performance, with some of the defining innovation as a lagged variable¹⁷.

Krastanova (2014) evaluated the association between informal payments on the firm level innovation in Bulgaria. There were fewer innovations in Bulgaria according to the European Union. The study utilized the panel data set for 2009 and 2013 from the Business Environment and Enterprise Performance Survey. The study employed the Probit regression model to test the relationship between bribery and innovation. The study found that informal payments or bribery increased firm level innovation. The results promoted the hypothesis of greasing the wheels of innovation. This study suggested based on results that corruption is not the major obstacle. The government should reduce the red tapes, explain proper innovation policy and improve the monitoring criteria.

Smith, Thomas, and Antoniou (2014) investigated the association between innovation, multinational firms, and institutions. They checked the impact of different types of multinational firms on innovation in Russia. They utilized the data collected by the Federal State Statics Bureau of the Russian Federation. They used the two subsamples; multinational firms from developed countries and from emerging nations. They used the sample size of 2958 firms from emerging economies and 5,615 from developed countries. The results showed that corruption promotes innovation due to a weak institution. In developed markets, the results showed the negative relationship between corruption and innovation.

¹⁷ Özçelik and Taymaz (2004) also suggested that R&D activities are significant drivers of international competitiveness of Turkish manufacturing firms. In contrast, Lefebvre, Lefebvre, and Bourgault (1998) and Becchetti and Rossi (2000) indicated an insignificant effect of R&D intensity for Canada and for Italy, respectively.

Ellis, Smith, and White (2015) examined the effect of corruption on private corporate sector innovation in the United States of America. They derived the data from the US Department of justice on local political corruption for the years 1977 to 2009. They employed the ordinary least squares, instrumental variable regression, fixed effect, and logit models for the estimation of variables. The results showed that local corruption was negatively associated with the quality, quantity, and innovation of the firms. The results suggested that informal payment and another cost of corruption reduce the innovation and efficiency of innovation.

Nguyen, Doan, Nguyen, and Tran-Nam (2016) investigated the impact of petty corruption on innovation. They used the data from SMEs survey in Vietnam from 2005-2011. They employed a logistic regression model and the instrumental variable model for the estimation of different variables. There were two theoretical models; greasing the wheels and sand the wheels. The study found that informal payments promote all types of innovation¹⁸.

Sdiri and Ayadi (2016) analyzed the impact of bribes on product innovation and process innovation in Tunisia. They utilized the single wave of WBES data conducted in 2013. They used the corruption obstacle as a dependent variable. The sample size of the study was consists of 592 Tunisian firms. They used the ordered discrete choice models. They employed an ordered logit regression model. The results indicated that innovation and corruption obstacles are negatively correlated. They evaluated that obstacle to corruption and competition is negatively associated. They suggested that the creation of information and communication technologies (ICT) induce the rise of a new anti-corruption network.

¹⁸ Van Beveren and Vandebussche (2010) suggested a positive association of intensity of trade for Belgian exporting firms on product innovation.

Heredia, Flores, Geldes, and Heredia (2017) explored the impact of corruption on firm level innovation in emerging economies. The study analyzed the impact of the quality of governance and labor market rigidities on innovation. They utilized the data set from the World Bank Enterprise Survey. The sample consists of 3296 firms from Pacific Alliance countries. They developed the theoretical model which was tested by employing the Structural Equation Modeling. The results showed that corruption (informal competition) has a negative effect on the innovation performance of firms that showed that informal competition reduces innovation.

Habiyaremye and Raymond (2018) examined the corrupt practices of foreign firms on the innovational activities of local firms. They used the data from the Business Environment and Enterprise Survey. The sample size in the study was 12000 firms of thirty countries of Central and Western Asia and Eastern Europe. They employed the Pairwise correlation and Simultaneous-equations discrete choice model. The results indicated that grand corruption promotes research and development activities whereas petty corruption of international firms faster the innovation in the local market. The involvement of local firms in petty corruption is detrimental to innovation and incremental innovation. The study suggested that the hypothesis of grease the wheels in this study are not valid for major innovation.

Xia, Tan, and Bai (2018) found the new version of firm level corruption. The study explored the relationship between female top-level management and corruption on firm level technological innovation by using the sample of SMEs in China. In this study, corruption was measured by informal payments. They used the data set from the World Enterprise Survey by the World Bank. The representative sample of this study is 2700 business firms in 15 cities of China. They employed the ordinary least squares and logistic regression models for the estimation of variables. The results found that top female managers were less innovative than male managers.

After controlling firm characteristics, corruption has a positive impact on innovation, but this impact was very weak in those firms where females were top executives. The results also found that the female manager is less corrupt in private SMCs. The collective results showed that innovation depends upon corruption. The study suggested that bribery at a firm level should be combated.

2.5 Research Gap

This work will contribute to the area of corruption, innovation, and firm performance. The followings are the gaps to be filled by the study.

1. Aggregate determinants of corruption by using the Corruption Perception Index cannot explain the variation in corruption within the country. Macro determinants cannot significantly assess the effect on individual agents because of the aggregate nature of data. This study will find the firm level determinants of corruption in 147 economies.
2. Regardless of enormous firm level studies on corruption, to the best of our knowledge, none of the studies has investigated the impact of corruption on firm performance in a large number of economies. This study provides disaggregated analysis based on World Bank Income wise classification (high income, lower-income, upper middle income and lower middle income) and regional wise classification (East Asia and Pacific, Eastern Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, OECD, South-Asian and Sub-Saharan Africa)
3. Innovation was considered as the backbone for enterprises in this world of competition. Despite the vast literature on firm level innovation, only a few studies have investigated the impact of corruption on innovation only for individual economies. Our study covers global

economies. So, this study will contribute to the area of firm level innovation by empirically testing the impact of corruption on the innovation of the firms.

Chapter 3

Theoretical Framework

This chapter sheds light on the definition of corruption and describes various theories of corruption. As the main focus of the current study is on firm level analysis of corruption, this chapter also explores the existing literature related to the main variable used in this study.

3.1 Definition of Corruption

Among the issues in analyzing corruption, it is pertinent to procure a succinct definition of corruption (Jain, 2001). A definition is significant since, among other items, it finally decides how corruption can be measured (Lancaster & Montinola, 1997; Philp, 1997). The term "corruption" is used to mean unique things in different state contexts (Bardhan, 1997). The term corruption can be defined as an individual demonstration of an unlawful payment on the endemic breakdown of an entire political framework. The definitions utilized in the numerous investigations about corruption vary from "the abuse of public power" and "moral demolition" to stricter lawful definitions like "a demonstration of bribery concerning a local official and an exchange of wealth." It is important that the notion of corruption should be explained prior to development of any corruption model.

The definition of corruption adopted by the World Bank (1997) narrates that "Corruption is the abuse of public power for private benefit". According to ICRG (2009) "Corruption is such as bribery, embezzlement of government funds, nepotism, illegal appropriation of public resources, excessive patronage, job reservations, favor-for-favors, secret party funding and suspiciously close ties between politics and business".

3.2 What is Firm level Corruption

The question "What is corruption?" is frequently raised in the literature. The definitions of corruption created by the World Bank and Transparency International are frequently used, they define it as "the abuse of public power for private gain." Degenerate exchanges happen in the interface of the overall population and the private business (Rose-Ackerman, 2004), whereby public goods have been misguidedly moved into individual settlements (Luo & Han, 2009). From the previous definition, abuse or misuse generally entails applying a legal standard or a breach of legal standards (Kaufmann, 1997). Public power means the power of the individuals' representatives to authorities. Corruption happens when officials utilize the capability to further their interests at the expense of the common good (Jain, 2001). Public Power from one perspective is mishandled for individual advantage once an official takes a bribe. It is additionally mishandled for private increase when officials effectively offer fixes to high-level administrators to bypass public policies for advantages. Even with no bribe trade, public power could be abused for private gain through different forms of corruption, such as embezzlement of state resources, patronage, nepotism, along with the diversion of state earnings. The above definition of corruption could widely capture, as an instance, bribery, embezzlement, fraud, nepotism, extortion. These notions are used interchangeably, but corruption is most frequently used by the World Bank (Jain, 2001).

From the definition of the World Bank, bribery is described as "the offer or solicitation, promise or gift of undue pecuniary or other advantages whether made directly or through intermediaries, to (foreign) officials or a third party to influence the actions of a public official or the officials' duties." This definition, therefore, catches several attributes. Firstly, giving or offering bribery that encompasses both the supply side (the provider) and the demand side (the receiver).

Secondly, something of value, services or future promise. Lastly, influencing the activities of a public official that goes against the law. From the above definition, bribes could be known as payment made to induce a government officer to act against the law (James, 2002).

Therefore, bribe transactions can be performed by different actors for various functions. Firms give bribes with the aim of influencing a government's choice to select which companies will be permitted to provide products, services, or get a government contract. Moreover, companies may pay officials to decrease the quantity of tax or other penalties, to receive issuance of a permit, to accelerate bureaucratic flaws, or to alter the results of legal processes. Luo and Han (2009) imply bribes refer to the extent to which the company engages in a variety of payments to public officials to "get things done" with respect to public or government services like customs, taxation, permits, regulations. Bribery is bilateral that involves someone in the government, a bribe recipient, and someone from the private sector, a bribe payer (Cuervo-Cazurra, 2006; Treisman, 2000). This thesis is based on the bribe payer, which is usually a firm or an organization that offers bribes to a public official to get things done.

3.3 Theories of Corruption

Literature provides different theories of corruption. These are rent-seeking and public choice theories.

3.3.1 Rent-Seeking Theory

There is a variety of theories that spell corruption¹⁹. One persuasive notion that is broadly regarded as the key explanatory theory of this occurrence of corruption is the rent-seeking

¹⁹ See for the impact of corruption See for the impact of corruption (Djankov et al., 2002; Hellman et al., 2003; Persson et al., 2003; Treisman, 2000).

theory. This theory prevents corruption because of a particular rent-seeking activity and perspectives bribery for a mean that is supplied by firms to government officers to acquire preferential treatments (Rose-Ackerman, 2004). Government intervention mainly causes bribery (Buchanan, 1980; Manion, 2004). Emerging markets that have elevated degrees of governmental intervention concerning permits and quotas suffer a lot from corruption. This deficiency indicates there is potential that rent-seeking activity like bribery does occur. Moreover, most usually, firms tend to discover bribery will be the only means to do good for their business simply because they gain prevalence from government officials. Ngo (2008) concludes that rent-seeking is now believed to become probably the most usual way to obtain corruption in these times in China because firms bribe in exchange for rents like an economic advantage in the shape of subsidies or tariff coverage. Ngo (2008) further asserts that a huge most rent-seeking activities bear right on the predominance of bribery in China. Firms are thought of as rational actors, especially if it has to do with the choice to take part in bribery. As the neo-classical economic theory implies, rational actors base their conclusions in just a benefit-cost frame Michaels & Miethe (1989). The firm chose to pay for a government officer once it benefits their business performance to such a degree that with no recourse, the business will probably get left behind on distinguished resources. Gao (2010) provides evidence that there is a constructive relationship between a business's perceived benefit and its attitude towards bribery. He asserts that given the cost of bribery, businesses tend to pay bribes increases once the perceived benefit rises.

3.3.2 Public Choice Theory

Besides the rent-seeking notion, scholars agree on just two other rival concepts which encircle the interaction between bribery and business performance. The primary theory ensures the quite prominent ethical theorization, meaning bribery has an adverse ripple effect on business

performance because of rent-seeking, misallocation of funds, and ineffective investments²⁰. Myrdal (1968) asserts that corrupt government officials may purposefully completely postpone licenses etc., that will otherwise not happen to extract a bribe. Such payment to public officials increased the overall cost of business that affects business performance. Fisman and Svensson (2007) conducted research and discovered a one percentage point growth in bribes is related to a decrease in business expansion by three percentage points. The study of Djankov et al. (2002) also provided the same results. Within their analysis, they asserted that elevated degrees of bribery end in high cost for organizations like trade costs and so restricts business operation. Because of this, firms who operate within this inadequate environment feel pressured with this stern tax. Bribery reduces firm growth and financial resources (Mauro, 1995; Wei, 2000).

3.3.3 Why Official Demand Bribes

Literature additionally provides various explanations concerning the reasons why government officials demand bribes. Relative low wages for public officers are claimed to be an underlying source of corruption in developing nations. The income of the employees in the private organization far above from the income of public officials, that gap of income differential between public and private employees induced public official to demand informal payment.

3.3.4 Why Firm Offer Bribes

Bribery calls for an illegitimate trade between government officers and firm. Within this work, the emphasis will be really on the connection between government officers and firms that supply the bribes. It is thus crucial to understand the role and reasons for government officials to take

²⁰ For negative effect of corruption (Doh, Rodriguez, Uhlenbruck, Collins, & Eden, 2003; Donadelli & Persha, 2014; Faruq et al., 2013; Frye & Shleifer, 1997; Gray et al., 2004; Keefer & Knack, 1997; Mauro, 1995; Rodrik, Subramanian, & Trebbi, 2004; Wieneke & Gries, 2011).

bribes and also to realize that firms are a part of the situation too. It is very therapeutic for authorities to participate in bribery since they receive fiscal incentives for compensation. Firms, however, base their decision to take part in bribery after a cost-benefit analysis.

There are four major advantages of firms for bribing government officers. The initial advantage identifies this powerful relationship to help to reduce bureaucratic problem. Bribery has a beneficial impact on business productivity as a result of the preferential procedure. Secondly, corruption could increase aggregate efficacy when a business is coping with weak institutions. Specifically, the weak institutions are just one of the principal reasons why authorities assert control over resources. This suggests that firms operating in such markets are very determined by authorities on account of their dependence on those resources. Third, businesses consider that they get easy access to markets, winning contracts and positive treatment if they bribe government officials. By paying bribes, firms make an effort to obtain a bigger market share that benefits their earnings.

3.4 Types of Corruption

3.4.1 Administrative or Petty Corruption

It is offering incentives to either civil servants and the political elite or administrators and the individuals for acquiring different administrations including the accomplishment of regulations. Petty corruption involves smaller sums and junior officials.

3.4.2 Political or Grand Corruption

Grand corruption is connected with a lot of money and high-level officials, where organizations or the administrative elite attempt to influence the plan of enactment, guidelines, orders, or other government approaches furthering their potential benefit (Hellman, Jones, & Kaufmann, 2003).

3.4.3 Necessary Corruption

It comprises bribes to acquire lawfully qualified support. In this type of corruption, individual or firm themselves offer bribes or give various gifts or informal payments to a public official to obtain legally entitled services to avoid procedural hurdles or before time.

3.4.4 Actual Corruption

It contains bribes to acquire illegally qualified support. Companies pay a bribe to decrease tax payments (Argandoña, 2005). Bribery and facilitation obligations have minor but nevertheless significant differences. It may also be in the form of charity or contributions, gifts, or donations to political parties.

3.5 The Determinants of Corruption

The first objective of our study is to identify the factors that are responsible for corruption. In order to meet this objective and to identify the research gap, it is essential to discuss the factors that cause corruption. Our main focus and interest are to unfold firm level determinant of corruption. So, we will generally present country-level determinants while we briefly discuss the firm level determinants of corruption.

3.6 Macro level Determinants of Corruption

Macroeconomic determinants include economic factors, Political factors, institutional and bureaucratic factors and religious Factors.

3.6.1 Economic Factors

Macro level determinants include national income, Economic freedom, international trade, human capital, and population size. These indicators are also known as economic factors that

refer to a huge array of variable, one of which are national income, economic liberty, and global trade. Economic factors also include demographic factors like human capital and other features like population size. National Income is a regular variable used to describe corruption (Ali & Isse, 2002)²¹. There is widespread consent in the literature about the presence of an adverse correlation between corruption and national income²², usually measured by per capita gross domestic product (Braun & Di Tella, 2004; Chang & Golden, 2007; Fisman & Gatti, 2002; Graeff & Mehlkop, 2003). The caveat is that higher-income tends to reduce the inducements for corruption since community servants with sufficient income will probably have less have to supplement their earnings with corruption. Economic freedom and overseas aid will also be significant sources of corruption. Ades & Di Tella (1999) indicated that free trade is the main element for experiencing comparatively low levels of corruption (Persson, Tabellini, & Trebbi, 2003). This argument advises that the larger the obstacles to entry and exit which companies face, the greater the distortions in a company environment, and so the more prevalent corruption will probably likely be (Gurgur & Shah, 2005). International trade is also one of the important determinants of corruption. Herzfeld & Weiss (2003) and Frechette (2006) both suggested that the share of import in national income correlates with corruption. A greater share of imports in national income decreases corruption because it is associated with lower tariffs on imports (Seldadyo & de Haan, 2006). In addition, other sociodemographic determinants such as human capital and population size have an impact on corruption. In general, human capital is negatively associated with corruption. Investing in educational systems in poor countries with weak institutions is argued to reduce corruption (F. Huang & Rice, 2012; Kwok & Tadesse, 2006). A better-educated population will suffer less from bribery activities by politicians because better

²¹ See (Damania, Fredriksson, & Mani, 2004; Persson et al., 2003).

²² See (Kunicova & Rose-Ackerman, 2005; Lancaster & Montinola, 1997; Serra, 2006; Treisman, 2000).

educational systems expose people to new ways of thinking and potentially prompt them to change the old ways of life, including corruption (Kwok & Tadesse, 2006). In this way, this finding infers that a more educated society would be relied upon to endure pay off less. There is conflicting evidence for corruption and a country's population size. Knack & Azfar (2003) found that when population increases, it leads to an increase in the level of corruption. In a large country with a relatively low density of government officials per citizen, citizens may bribe officials to jump in the bureaucracy queue (Fisman & Gatti, 2002). An increase in population has an inverse effect on corruption (Tavares,2003).

3.6.2 Political Factors

Political factors have a significant impact on corruption. Kunicova and Rose-Ackerman (2005) found that democracy, electoral system, political instability, and governance are the important determinant of corruption.

3.6.3 Institutional and Bureaucratic Factors

At the macro level, judicial and bureaucratic variables have a significant impact on corruption. The empirical literature provides strong evidence that institutional weakness and quality of bureaucracy has a positive effect on corruption (Herzfeld & Weiss, 2003).

3.6.4 Institutional and Bureaucratic Factors

Religious factors, such as geography, culture, and religion, have a significant impact on the likelihood of corruption. The bulk of empirical literature evidenced that heterogeneity in ethnolinguistic affect corruption positively.

3.7 Micro level Determinants of Corruption

Firms operating in precisely the same state can vary in their propensity to pay bribes due to the following factors. These factors are known as micro-level determinants of corruption.

3.7.1 Return on Capital

Return on capital²³ is one the determinant of micro-level corruption, and it is considered one of the significant drivers of bribery. Successful firms can pay more bribes, since the higher the firm's capacity to pay a bribe, the more vulnerable place the company is at a negotiation process, hence increasing the chance to pay a bribe (Fisman & Svensson, 2007).

3.7.2 Firm Age

Firm age is one of the important determinants of corruption. The younger firm pays more bribes to a public official as they have to establish their business. Older firms are less inclined to pay since they are more likely to have established a continuing relationship with government officials, which reduces bribes in a strong tie with officials that may make an advantageous place for private firms (Čábelková & Hanousek, 2004; Kuncoro, 2004).

3.7.3 Firm Size

Smaller firms have a more noteworthy affinity to pay off contrasted with larger firms since the later has more abilities to oppose extortions from individuals officials. The absence of strong internal processes for managing diverse organization frauds, for example, pay off can expand bribery exercises and smaller firms to some degree more averse to have internal protocols set up contrasted with greater firms. Little firms may be obvious objectives since they come up short on

²³ Clarke and Xu (2004) reveal that companies are more likely to pay bribes if they're more profitable. Safavian, Graham, and Gonzalez-Vega (2001) reported the exact same outcome.

the ability to withstand ruthless officials' prerequisites for bribe payments in addition to they do not conventionally draw in much consideration from authorities' disciplinary organizations and law enforcement authorities (Herrera and Rodriguez, 2003).

3.7.4 Manager Experience

The manger experience is one of the significant determinants of corruption. The experience of the manager is inversely associated with the probability of bribe payments (Collins et al., 2009).

3.7.5 Exports

The worldwide activities of a company may matter. Exported firms participate less in bribery since they are not as vulnerable to local corrupt environments and might get more preferential treatments, particularly in emerging countries where export-oriented policies are ardently supported (Luo and Han, 2009). Additionally, exported companies may have higher access to outside financing and so have more bargaining power in negotiations for loans with local banks or government officials (Barth, Lin, Lin, & Song, 2009).

3.7.6 Crimes

Crimes and corruption are some of the top deterrents for firms to work together in most developing territories. Low wellbeing condition firms convey extra operational expenses either on security measures or bribe payments for security. According to Goldberg, Kim, and Ariano (2014), firms distinguished crimes as one of the significant barriers. Gaviria (2002) in his work about the influence of corruption and crimes on firms' performance, found that for Latin American firms, crimes and corruption hurt firm performance.

3.7.7 Taxation

Tax avoidance is a typical kind of financial extortion among firms (Palda, 2001). Tax avoidance gives firms having an impetus to influence bribe tax collectors to overlook the extortion or to limit the sanction, and that is the reason one may envision that firms confronting enormous taxes could have a higher affinity to offer bribes since firm thinks about tax as one of the significant hindrances in the extension of their business.

3.7.8 Bureaucratic Problem

The prevalence of bribery could be explained by the form of regulations or policies across industries. Firms have to pay more bribes when dealing with officials whose activities directly affect their company tasks than people who do not. A firm that spent more time with bureaucrats to avoid procedural is more likely to pay bribes (Svensson, 1999; Kuncoro, 2004).

3.7.9 External Audit

A firm with yearly inspections of the book of accounts is less likely to pay a bribe (Safavian, Graham, & Gonzalez-Vega, 2001) thus, weak institutions lead individuals to trespass legality and increase the willingness to pay bribes. Barth et al. (2009) reported that corruption declines as judges and law enforcement are enhanced. The more transparent the interpretation of legislation and regulation is regarded as the more effective government agencies are, the firms are less corrupted.

3.7.10 Corporate Governance

Theoretically, corporate governance may appear to have a significant effect on bribery. Due to information asymmetry and principal-agent problems, firms involved in bribery. With proper corporate governance, firms can ensure transparency and accountability which inversely affected

firms' involvement in bribery. Wu (2009) concluded that firms with good corporate governance are less vulnerable to bribery.

3.7.11 Poor Accounting Practice

Accounting is the mechanism in which the proper record of financial transactions maintained systematically. Corruption involves a financial transaction. Proper and systematic accounting practices impose constraints on bribery (Lee & Oh, 2010). Firms with poor accounting practices are more likely to involve in bribery.

3.7.12 Market Competition

Market competition reduces the chances of bribery as compared to monopoly. Competition reduces firms' reliance on government officials. According to Clarke and Xu (2004) competition reduces the probability of bribery. Competitive firms are less likely to involved in corruption (Ades & Di Tella, 1999).

3.7.13 Legal System

The corrupt legal system encourages government officials that demand bribes and firms that offer bribes (Sanyal, 2005). The corrupt legal system increases the probability of bribes for firms.

3.7.14 Quality of Government Services

Failure of government in the provision of quality services may affect the involvement of bribery in firms positively. Low quality of government has a positive effect on the chances of bribery (Atangana Ondo, 2013).

3.7.15 Court Fairness

Harsch (1993) found that the fairness of the court system has a significant impact on firms' probability of paying bribes. If the court system is unfair firms are more likely to pay bribes.

3.7.16 Access to Finance

Access to finance is another determinant of corruption at the firm level. In the empirical analysis of African firms, Diamond (1987) consider access to finance as an important determinant of bribery. They concluded that access to finance reduces the likelihood of corruption in Eastern Africa, Western Africa but increases Central and South Africa.

3.5 Effects of Corruption on Firm Performance

The empirical research on impact of corruption provides heterogeneous evidences at national and firm level tracks. The researchers and policymakers at one strand consider that hypothesis of “sand the wheels” is valid for both tracks. Some of the macro level studies concluded that corruption is negatively linked with economic growth (Aidt, 2009; Méon & Sekkat, 2005; Ugur & Dasgupta, 2011; Zelekha & Sharabi, 2012). Similarly some of the studies at firm level concluded that corruption reduces investment and suppressed the output (Asiedu & Freeman, 2009; Fisman & Svensson, 2007). Kong, Dongmin, Wang, and Wang (2017) used Quasi-natural experiment to find out effect of anti-corruption on firm performance. They concluded that anti-corruption deteriorates private firm's performance and augments performance of public enterprises. Van Vu, Tran, Van Nguyen, & Lim, (2018) utilized GMM on small and medium scale enterprise survey to find the impact of corruption on financial performance of firms in Vietnam. They also indicated that bribe intensity reduces firm performance.

On the other hand, the hypothesis of "grease the wheels" is also found valid by national and firm level studies. At the macro level some of the studies showed the positive effect of corruption on economic growth (Dreher & Gassebner, 2013; O'Toole & Tarp, 2014). On the same lines some of the firm level studies also concluded that corruption increases profitability of private firms (Jiang & Nie, 2014), improves the growth of firms (Vial & Hanoteau, 2010a), and improves firm performance (Mendoza, Lim, & Lopez, 2015; Sequeira & Djankov, 2014). Wu (2009) found that most Asian firms are involved in corrupt practices. Corruption is institutionalized, and firms are willingly paying informal payments to accelerate the production of goods and services. Collins, Uhlenbruck, and Rodriguez (2009) examined the causes of firm level corruption in India and found that managers are engaged in corrupt practices with public officials to get benefits and being competitive. Manager's relationships with public officials, ignoring the laws regarding corruption, membership in political parties, and support for political activities are major determinants of corruption in India. Williams and Kedir (2016) tested two contending hypotheses "sand the wheels" and "grease the wheel". They found that corruption increases sales, employment and productivity across 40 African countries. Riaz and Cantner (2019) investigated the impact of judicial, political, petty and grand corruption on innovation. The results showed that petty and grand corruption has positive impact on innovation, while the effect of corruption on services sector innovation was considerable as compared to innovation in manufacturing.

3.6 Effects of Corruption on Firms' Innovation

It is well acknowledged that innovation is key driving force of economic development (Kogan et al., 2017). The process of innovation represents the dynamic and systematic advancement of products, processes and organizational work methods. It is the process of change or the

transformation of knowledge, ideas, and inventions into commercially viable goods, services or processes. Overall, innovation is a driver of firm performance and economic growth. Firms engage in innovation in order to increase their productivity, competitiveness, and market share which ultimately increases their profits (Love and Roper, 2015). Corruption is chiefly viewed as an obstruction for innovators since it raises the measure of uncertainty and equivocality they have to endure. The empirical research on corruption provides heterogeneous evidence at national and firm level tracks. Researchers at one strand support the hypothesis of “sand the wheels” while, other strand support "grease the wheels" hypothesis. One strand argued that corruption is negatively linked with economic growth (Aidt, 2009; Méon and Sekkat, 2005; Ugur and Dasgupta, 2011; Zelekha and Sharabi, 2012). Firm level studies concluded that corruption reduces innovation (Shleifer and Vishny, 1993). Anokhin and Schulze (2009) found that corrupt firms are less likely to innovate. Using cross-section data of 2000 Indian firms de Waldemar (2012) found an inverse relationship between bribe payment and product innovation, providing evidence for a sanding hypothesis. Farooq et al. (2013) examined that how corruption affects economic growth in Pakistan by augmenting trade openness and financial development. The structural break cointegration results indicated that corruption is detrimental to economic growth. Athanasouli and Goujard (2015) concluded that probability of corruption is greater for firms which are more contract dependent, having lower management practices and productivity.

At the other strand, Méon and Weill (2010) examined the interaction between governance, corruption, and aggregate efficiency and using a panel dataset of 69 developed and developing countries found that countries with extremely ineffective institutions provide support for greasing hypothesis. Dreher and Gassebner (2013) found positive relationship between corruption and the number of new entrepreneurs. Goedhuys et al. (2016) using the dataset of

World Bank Enterprise Survey of 3489 firms in Egypt and Tunisia analyzed the direct and indirect effect of corruption on innovation and firm growth. They used four types of innovation measures (product, process, organizational, and marketing) but mainly focused on product innovation. The results revealed that the severity of bureaucratic and institutional obstacles increase the likelihood to innovate. Nguyen et al. (2016) used a Logit model on SMEs data of 2500 Vietnam firms to investigate the impact of petty corruption on innovation and concluded that corruption is good for innovation. Huang (2016) investigated the impact of corruption on growth for a panel of Asia Pacific countries using bootstrap panel Granger causality approach. The study concluded that corruption is not bad for growth in Asia-Pacific region. Empirical evidence showed that organizations view debasement as a critical obstruction to doing business (Beck, Demirgüç-Kunt, and Maksimovic, 2005; Fisman and Svensson, 2007). Although there is immense literature on the impact of corruption on the firm' performance, the relationship between corruption and firm level innovation has just recently received consideration. Shleifer and Vishny (1997) was among the earliest papers to suggested that administration debasement debilitates development since the high need for mystery avoids passage of outside organizations. Veracierto (2008) officially declared that measures for the prevention of corruption could increase the chances of product innovation. Anokhin and Schulze (2009) additionally emphasized that in degenerate situations organizations are less inclined to profit by remote direct venture by organizations that utilized advanced innovation. Utilizing data from 64 nations and to the period 1996-2002, the authors revealed that there was a good concave connection between the control of corruption and the quantity of innovative domestic activity. Foreign companies' corruption practices in transition markets are detrimental to R&D attempts in the host nation (Habiyaemye & Raymond, 2018). Few studies found evidence for the positive impact of

corruption on innovation. Dreher and Gassebner (2013) utilized data from Egypt and Tunisia to of the MENA region, in which corruption was regarded as persistently large. They showed that if regulations abound, corruption raises the number of new entrepreneurs, thus functions as an efficient grease. Goedhuys, Mohnen, and Taha (2016) examined the hypothesis that the impact of corruption on innovation is dependent upon how severe bureaucratic and systemic obstacles are. The authors assumed that corruption exists if a firm perceives it as a price raising variable. They discovered that corruption reduces the adverse impact of red tape on product innovation.

Chapter 4

Data and Methodology

This chapter shed light on the mathematical and econometric specification of the model, measurement of the variables and operational definitions of the variables taken from the World Bank Enterprise survey. Section 4.1 of this chapter focuses on the functional form of the model for determinants of the corruption, section 4.2 is about the impact of corruption on innovation, section 4.3 narrates the impacts of corruption on firm performance, section 4.4 discusses the measurement and definition of the variables, section and 4.5 represents the various econometric techniques for empirical estimation.

4.1 Model Specification for Determinants of Corruption

The first objective of the study is to identify the factors that are responsible for firm level corruption. To achieve this objective, we have empirically estimated the model for aggregate and disaggregated form (income groups and regional groups).

4.1.1 Functional form of the Model

Following is the functional relationship between the dependent and independent variables.

$$\text{Corruption} = f \left[\begin{array}{l} \text{Bureaucratic Problem, Taxation, Exporting Firm, Firm age} \\ \text{Firm size, Manager experience, External Audit, Crime} \end{array} \right] \dots\dots(4.1)$$

4.1.2 Specification of Econometric Model

The categorical nature of the dependent variable suggests the use of the Logit model to find the determinants of corruption. The likelihood that a randomly drawn firm offers incentives is represented by the following equation.

$$\Pr(CORRP_i = 1) = \alpha + \pi_1 BUREAU + \pi_2 TAX + \pi_3 EXPORT + \pi_4 FAGE + \pi_5 FSIZE + \pi_6 MANEXP + \pi_7 EXAUDIT + \pi_8 CRIME + \varepsilon_i \dots \dots \dots (4.2)$$

It is hypothesized that bureaucratic problem (BUREAU) and taxation (TAX) increase the probability of corruption while exporting firm (EXPORT) reduce likelihood of corruption. Similarly, firm age (FAGE), firm size (FSIZE), manager experience (MANEXP) increase the probability of corruption, while chance of corruption is supposed to be lower in case of external audit (EXAUDIT). Similarly, it is hypothesized that crimes (CRIME) increases probability of corruption.

4.2 Model Specification for the impact of corruption on firms’ performance

The second objective of the study is to see the impact of corruption on firm performance. We have used the log value of real annual sale growth to capture firm performance. To achieve this objective, we have empirically estimated our model for aggregate and disaggregated form (income groups and regional groups).

4.2.1 Functional form of the Model

Effect of corruption on the performance of the firm is specified by the followings

$$\text{Firm Performance} = f \left[\begin{array}{l} \text{Corruption, Public listed company, Foreign firms, Firm age} \\ \text{Firm size, Manager experience, External audit, Skilled workers} \end{array} \right] \dots (4.3)$$

4.2.2 Specification of Econometric Model

$$PERFORM = \Omega_0 + \Omega_1CORRP_i + \Omega_2PLCOMP_i + \Omega_3FORFIRM_i + \Omega_4FAGE_i + \Omega_5FSIZE_i + \Omega_6MANEXP_i + \Omega_7EXAUDIT_i + \Omega_8SWORK_i + \varepsilon_i \dots\dots\dots (4.4)$$

It is hypothesized that corruption (CORRP) reduce the firm performance (PERFORM) while, public listed company (PLCOMP), foreign firm (FORFIRM), age of firm (FAGE), firm size (FSIZE), manager experience (MANEXP), external audit (EXAUDIT), and number of skilled workers (SWORK) increase the firm performance (PERFORM).

4.3 Model Specification for Impact of Corruption on Firms’ Innovation

The third objective of the study is to quantify the impact of corruption on firm level innovation. To achieve this objective, we have empirically estimated our model in aggregate and disaggregated form (income groups and regional groups).

4.3.1 Functional form of the Model

Following is the functional relationship between the dependent and independent variables.

$$Innovation=f \left[\begin{matrix} Corruption, domestic firms, Registered firms, Firm age, Firm size \\ Manager experience, External audit, Skilled workers, Exporting firm \end{matrix} \right] \dots(4.5)$$

4.3.2 Specification of Econometric Model

To estimate the impact of corruption on innovative capabilities of the firms, we will use Logit specification to find out the probability of innovation.

$$Pr(INNOVATION_i = 1) = \mu_0 + \mu_1CORRP_i + \mu_2DOMFIRM_i + \mu_3REGFIRM_i + \mu_4FAGE_i + \mu_5FSIZE_i + \mu_6MANEXP_i + \mu_7EXAUDIT_i + \mu_8SWORK_i + \mu_9EXPORT_i + \varepsilon_i \dots(4.6)$$

It is hypothesized that Corruption (CORRP), domestic firm (DOMFIRM) reduce the firm probability of innovation while, registered firm (REGFIRM), manager experience (MANEXP),

external audit (EXAUDIT), age of firm (FAGE), firm size (FSIZE), number of skilled workers (SWORK), and exporting firm (EXPORT) increase the firm probability of innovation.

4.4 Measurement and Construction of Variables

In order to measure the core and control variables, we used definitions provided by the World Bank (2019) in “enterprise surveys indicator descriptions.”

4.4.1 Firm level Corruption

Firm level corruption has been included in the analysis for Equation 4.1 as the dependent variable to see what factors are responsible for firm level corruption, for Equation 4.3 to see the effect of corruption on firm performance, and for Equation 4.5 to see the effect of corruption on innovation. In the literature, the majority of the studies have shown mixed results regarding the impact of corruption on firm performance. Corruption work as “grease the wheel” (Jiang & Nie, 2014; Mendoza et al., 2015; Sequeira & Djankov, 2014; Vial & Hanoteau, 2010b) and it works as “sand the wheel” (Fisman and Svensson, 2007; Asiedu and Freeman, 2009). It is hypothesized that for high income and upper middle income nation corruption work as sand the wheel and for lower middle and lower income it works as grease the wheel. We have measured the firm level corruption through the WBES Question j7a. It is the “percent of firms expected to give gifts to public officials (to get things done).” We have converted it into dummy variable, For bribe payment = 1, otherwise = 0.

4.4.2 Firms’ Performance

Firm performance has been included in the analysis for Equation 4.3 as a dependent variable to quantify the impact of corruption on firm performance. In the literature, various indicators have

been used to measure firm performance²⁴. We have used annual real sale growth to measure the impact of corruption (Fisman & Svensson, 2007; Sharma & Mitra, 2015). The firm performance is measured through the WBES Question d2. It is the “percent of firms last year annual real sales growth.” We have taken a log of real annual sale growth as the proxy to measure the firm performance.

4.4.3 Innovation

Innovation has been included in the analysis in Equation 4.5 as a dependent variable to quantify the impact of corruption on firm innovation. In the literature, the majority of the study has shown mixed results regarding the impact of corruption on firm performance. Corruption has been found positively associated with innovation (Veracierto 2008), as well as negatively associated with innovation (Anokhin and Schulze 2009). It is hypothesized that for high income and upper middle income nations corruption reduces innovation and for lower middle and lower income it has a positive effect. Firm level innovation is measured in the current study through the WBES Question hb1. It is the “did this establishment introduce any innovative product or service.” It is a dummy variable for the introduction of innovative product or service = 1, otherwise = 0.

4.4.4 Bureaucratic Problems

Bureaucratic problem has been included in the analysis for Equation 4.1 to see that to what extent it is responsible for firm level corruption. According to Svensson (1999) the firms’ management that spent more time with bureaucrats to avoid procedural problem is more likely to pay bribes. Bureaucratic problem has positively effect on corruption (Kuncoro, 2004). On the basis of empirical evidence, it is hypothesized that bureaucratic problem increases firm level corruption. Bureaucratic problem is measured through the WBES Question j2. It is the “senior

²⁴ Productivity, Employment of workers and capacity utilization are alternative measures of firms’ performance.

management time spent in dealing with requirements of government regulation.” It is dummy variable, for time spent = 1, otherwise = 0.

4.4.5 Taxation

Taxation as the variable for estimating the determinants of firm level corruption has been included in Equation 1. There is widespread consensus in the literature that tax work as major hurdles, and it increases the likelihood of firm level corruption. Tax avoidance is a typical kind of financial extortion among firms that are looked at with high tax assessment (Palda, 2001). Tax avoidance gives firms having an impetus to influence bribe tax collectors to overlook the extortion or to limit the sanction, that is the reason one may envision that firms confronting enormous taxes could have a higher affinity to offer bribes since firm thinks about tax as one of the significant hindrances in the extension of their business. It is speculated that the variable of taxation increases the probability of corruption. In this study, taxation is measured through the WBES Question j30a. It is the “firms identifying tax rates as a major constraint for firm growth.” It is dummy variable categorized as taxation = 1, otherwise = 0.

4.4.6 Crimes

Crimes have been included in the analysis in Equation 1 to see its impact on firm level corruption. According to Goldberg, Kim, and Ariano (2014), firms identified crimes as one of the significant barriers of working with cost stretching around ten percent for an economy in cases of some developing countries in Latin America. Gaviria (2002) examined the influence of corruption and crimes on firms' performance and found that for Latin American firms, crimes and corruption harms firm performance. It is speculated that crimes increase the probability of corruption. Crimes as a variable is measured through the WBES Question i4a. It is the “in the

fiscal year did this establishment experience losses as a result of theft, robbery”. It is a dummy variable coded as crimes = 1, otherwise = 0.

4.4.7 Foreign Firm

The foreign firm has been included in the analysis as the independent variable (See Equation 4.3) to see the effect of corruption on firm performance. Greater mobility of capital increases firm performance (Fisman & Svensson, 2007). It is speculated that the greater the share of foreign ownership, more the efficiency of the firm. We have measured the foreign firm through the WBES Question b2b, i.e., “percentage of firm owned by foreigners.”

4.4.8 Domestic Firm

In the current study domestic firms has been included in the analysis as an independent variable for Equation 4.5 to see the effect of corruption on firm innovation. It is hypothesized that the domestic firm is less innovative in low income and lower middle income countries while the firms in upper middle income and high income nation are more innovative. The domestic firm has been measured through the WBES Question b2a, that is the “percentage of firm owned by the domestic owner.”

4.4.9 Registered Firm

In the current study the variable of registered firm has been included in the analysis as an independent variable in Equation 4.5 to see the effect of corruption on firm innovation. It is hypothesized that the registered firm is more innovative. The registered firm has been measured through the WBES Question b6a, that is the “was this establishment formally registered when it began operations”. It is a dummy variable coded as registered = 1, otherwise = 0.

4.4.10 Firm Age

The variable of firm age has been included in the analysis as an independent variable in Equation 4.1 to see its effect on firm level corruption, for Equation 4.3 to see its effect on firm performance, and for Equation 4.5 to quantify its effect on firm level innovation. The younger firms have a greater probability of paying bribes as compared to older firms (Čábelková & Hanousek, 2004; Kuncoro, 2004). It is speculated that the age of the firm as a variable reduces the likelihood of corruption and improve firm performance and innovation. The current study measured firm age through the WBES Question b5. It is the “In what year did this establishment begin operations.” It is a continuous variable. We have calculated the age of every firm through the formula “Survey Year - year of establishment the firm began operations.”

4.4.11 Firm Size

Firm size has been included in the analysis as an independent variable for Equation 4.1 to see how it may affect firm level corruption, for Equation 4.3 to see its effect on firm performance and for Equation 4.5 to quantify its effect on firm level innovation. Smaller firms have a greater propensity to bribe as compared to bigger firms since the latter have more skills to defy bribe extortions from public officials. Smaller firms may be the easy targets because they lack the power to withstand predatory officials' requirements for bribe payments, furthermore they do not ordinarily take attention from authorities' disciplinary agencies and law enforcement authorities (Herrera and Rodriguez, 2003). It is speculated that the size of the firm as a variable increases the likelihood of corruption and improves firm performance and innovation. Firm size is measured by "the number of permanent workers." (Zare Mehrjerdi & Saghaian, 2019) The firm with workers, greater than 5 but less than 19 is taken as smaller, greater than 20 but less than 99 as medium and firm with greater than 100 is taken as larger firms. We have combined the

medium and small firm to make it binary for utilizing as dummy variable in our analysis. The same transformation was adopted by Lee and Oh (2010). In our analysis, it is a dummy variable coded as medium and large firms =1, small firms=0.

4.4.12 Managers Experience

In the current study, the manager's experience as a variable has been included in the analysis in Equation 4.1 to see how it may affect firm level corruption for Equation 4.3 to see its effect on firm performance, and to quantify its effect on firm level innovation in Equation 5. Higher the manager experience the lower will be the probability of corruption (Collins et al., 2009). It is speculated that the experience of the manager reduces the likelihood of corruption and improves firm performance and innovation. The experience of the manager is measured through the WBES Question b7. It is the “years of experience of the top manager working in the sector.” It is a continuous variable.

4.4.13 External Audit

In the current study external audit has been included in the analysis as an independent variable for Equation 1 to see how it affect corruption at firm level for Equation 3 to see its effect on firm performance and for Equation 5 to quantify its effect on firms’ innovation. Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. It is speculated that the external audit reduces the likelihood of corruption and improves firms’ performance and innovation. The current study has measured the external audit through the WBES Question k21 that is the “percentage of firms with their annual financial statement reviewed by an external auditor.” It is a dummy variable coded as audit = 1, otherwise = 0.

4.4.14 Public Listed Company

Public listed company as a variable has been included in the analysis in Equation 4.3 to see its effect on firm performance. The market plays a vital role in the expansion of the business. Publicly listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004). It is speculated that the publicly listed company has a positive effect on firm performance. We have measured the publicly listed company through the WBES question b1, which is the “firms with the legal status of the publicly listed company.” It is a dummy variable coded as public listed = 1, otherwise = 0.

4.4.15 Exporting Firm

In the current study, the exporting firm as a variable defined as the firm with comparatively high ratio of exports in their sales has been included in the analysis as an independent variable for Equation 4.1 to see how it may affect firm level corruption for Equation 5 to quantify its effect on firm level innovation. The firms those have high ratio of exports have less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009). It is speculated that exporting firms reduce the likelihood of corruption and has a positive effect on firm innovation. We have measured the exporting firm through the WBES Question d3c. It is the “proportion of total sales in percentage that is directly exported by the firm. It is a continuous variable in the analysis.

4.4.16 Skilled Workers

Skilled workers have been included in the analysis as an independent variable for Equation 4.3 to see the effect of skilled workers on firm performance for Equation 4.5 to quantify its effect on firm level innovation. It is speculated that skilled worker has a positive effect on both firm

performances and on firm level innovation. We have measured the skilled workers through the WBES Question 14a, that is the “proportion of skilled workers out of all production workers.”. It is a continuous variable.

4.5 Data-Set

This study based on Enterprise Survey data conducted by the World Bank (World Bank, 2018). It is a firm level survey of small, medium and large companies that focus on topics related to the business environment. It gathers information on corruption, crimes, taxes, regulations, and business licensing, trades, infrastructure, finance, innovation, factors related to firm performance and perception about business obstacles. The current analysis will cover the data from 147 global economies comprising all income groups and regional groups²⁵. The data of these economies at the firm level covers the time period 2000-2016. The econometric framework for proposed empirical estimation of our research questions is discussed here.

Table 4.1: List of Countries

Argentina	Afghanistan	Armenia	Albania	Paraguay
Antigua and Barbuda	Benin	Bangladesh	Algeria	Peru
Bahamas	Burkina Faso	Bhutan	Angola	Romania
Barbados	Burundi	Bolivia	Azerbaijan	Serbia
Chile	Cambodia	Cabo Verde	Belarus	South Africa
Croatia	Central Afri Rep	Congo, Rep.	Belize	St. Lucia
Czech Republic	Chad	Ghana	Bosnia	St. V. G
Estonia	Congo, Dem. Rep.	Guyana	Botswana	Suriname
Germany	Eritrea	Honduras	Brazil	Thailand
Greece	Ethiopia	Kenya	Bulgaria	Tonga
Hungary	Gambia	Kosovo	China	Tunisia
Ireland	Guinea	Kyrgyz Republic	Colombia	Turkey
Israel	Guinea-Bissau	Lesotho	Costa Rica	Vietnam
Korea	Liberia	Mauritania		West Bank and Gaza

²⁵ Complete list of classification of income groups and regional groups are given in Annexure A and B respectively.

Latvia	Madagascar	Micronesia	Dominican Republic	Sudan
Lithuania	Malawi	Moldova	Ecuador	India
Oman	Mali	Myanmar	Fiji	Côte d'Ivoire
Poland	Mozambique	Nicaragua	Gabon	Cameroon
Portugal	Nepal	Pakistan	Grenada	Indonesia
Russia	Niger	Papua New Guinea	Iraq	Lao PDR
Saudi Arabia	Rwanda	Philippines	Jamaica	Morocow
Slovakia	Sierra Leone	Samoa	Jordan	Uzbekistan
Slovenia	South Sudan	Senegal	Kazakhstan	Panama
Spain	Tanzania	Solomon Islands	Lebanon	Montenegro
St. Kitts and Nevis	Togo	Somaliland	Macedonia, FYR	Namibia
Sweden	Uganda	Sri Lanka	Malaysia	Timor-Leste
Trinidad and Tobago	Zimbabwe	Swaziland	Mauritius	Ukraine
Uruguay	Djibouti	Syria	Mexico	El Salvador
Venezuela	Egypt	Tajikistan	Mongolia	Georgia
Yemen	Zambia			

4.6 Techniques for Empirical Estimation

In this study, we will use two different estimation techniques depending upon the nature of the data. For the determinants of corruption and the impact of corruption on Innovation, this study have used the logit model. The rationale for using this model is the qualitative nature of the dependent variable. For firm performance, the ordinary least square (OLS) technique has used to quantify the impact of corruption.

4.6.1 The Logistic Regression Model

In logistic regression, we measure the log of odd in favor or not in favor of an event. The standard form of the logistic regression model takes the following form.

$$\text{Logit}(\pi_i) = \log\left(\frac{\pi_i}{1 - \pi_i}\right) = \beta_0 + \beta_1 x_i$$

In the above logistic regression model $\pi_i = E(y_i)$ and y_i is a binary dependent variable.

4.7 Diagnostic Testing

4.7.1 Breusch-Pagan Test for Diagnostic Heteroscedasticity

The current study is based on the cross-section data, and when dealing with such type of data, there are greater chances of Heteroscedasticity (Gujarati, 2009). We will perform the Breusch-Pagan test to detect the presence of heteroscedasticity.

$$H_0: Var(u_i) = \sigma^2$$

$$H_1: Var(u_i) \neq \sigma^2$$

The decision rule for the detection of heteroscedasticity is that if calculated values of the Breusch-Pagan test are greater than the critical values of the test, then we will reject our null hypothesis and concludes the presence of heteroscedasticity.

Chapter 5

Results and Discussion: Determinants of Firm Level Corruption

This chapter provides results and discussion of determinants of firm level corruption. In this chapter, we have provided the answer to our first research question. This chapter meets our first objective, to identify the factors which are responsible for firm level corruption, aggregate analysis for global economies, disaggregated analysis for income group as well as for different regional groups.

5.1 Determinants of Firm Level Corruption in Aggregate Analysis

5.1.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the aggregate analysis are given in Table 5.1.

Table 5.1: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Aggregate Analysis

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1778109	.3823576	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.6038727	.4890957	0	1
Taxation (TAX)	Binary Variable	.5398599	.4984128	0	1
Exporting Firm (EXPORT)	Percentage	7.459691	21.84569	0	100
Firm Age (FAGE)	Years	19.1769	15.54594	0	340
Firm Size (FSIZE)	Binary Variable	.5950355	.490891	0	1
Manager Experience (MANEXP)	Years	17.7321	11.0299	0	144
External Audit (EXAUDIT)	Binary Variable	.5715643	.4948561	0	1

Crimes (CRIME)	Binary Variable	.1684169	.3742392	0	1
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Table 5.1 provides summary statistics of the variables analyzed for the determinants of firm level corruption in aggregate analysis. It explains that 17.8 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 60.4 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 53.98 percent of the firms reported that tax is a major constraint for their business. The average exports of the firms are 7.459. The average experience of the managers in the sample is 17.73 years while on average firms are 19.17 years older and 59.50 percent of firms are larger firms. In the sample of 147 countries, 57.1 percent of firms reported that their income statements and balance sheets were reconciled by external auditors. Similarly, 16.8 percent of firms involved in crimes.

5.1.2 Results and Discussion: Aggregate Analysis

To see the determinants of corruption in a firm, the binary logistic model has been applied for a sample of 147 countries²⁶ (aggregate analysis). The results of Equation No 5.1 are shown in Table 5.2. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.2: Regression Results of Determinants of Firm level Corruption: Aggregate Analysis

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.2108152*	.0162007	13.01	0.000

²⁶ The List of Countries is given in Table 4.1

Taxation (TAX)	.0021577*	.0003292	6.55	0.000
Exporting Firm (EXPORT)	-.3346392*	.0251142	-13.32	0.000
Firm Age (FAGE)	-.0015875*	.0005559	-2.86	0.004
Firm Size (FSIZE)	.0043418	.015957	0.27	0.786
Manager Experience (MANEXP)	-.0084306*	.0007696	-10.95	0.000
External Audit (EXAUDIT)	-.1618092*	.0160038	-10.11	0.000
Crimes (CRIME)	.2894477*	.020161	14.36	0.000
Constant	-.3380517*	.029757	-11.36	0.000
Observation	62460			
Overall Significance (F-value)	863.03			0.0000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.1.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result have shown that bureaucratic problem has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. Svensson (1999) narrated that the prevalence of bribery could be explained by the form of regulations or policies across industries. Firms have to pay more bribes when dealing with officials whose activities directly affect their company tasks. Kuncoro (2004) explained that firm that spent more time with bureaucrats to avoid procedural hurdles is more likely to pay bribes.

5.1.2.2 Taxation and Firm level Corruption

Theoretically, the taxation may affect corruption positively. It was hypothesized in section 4.4.5 that taxation would result in an increase in corruption. The result of the logistic regression analysis has shown that the result of taxation is positive and significant, which explains that taxation increases the probability of corruption. Tax avoidance is a typical type of financial extortion among firms that are stood up to with a high tax rate (Palda, 2001). Opportunities for tax evasion provide firms having an incentive to bribe tax collectors to forget the fraud or to minimize the sanction, and that is why one might anticipate that firms facing large taxes could have higher propensity to pay bribes because firm considers tax as one of the major obstacles in the expansion of their business.

5.1.2.3 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.1.2.4 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result of regression analysis shows that the value of firm age is negative,

which shows that the older firm is less likely to offer a bribe to a public official as compared to infant firms (Čábelková & Hanousek, 2004; Kuncoro, 2004).

5.1.2.5 Manager Experience and Firm Level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the result of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.1.2.6 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the result of external audit is negative and statistically significant, which shows that firms with an external audit are less likely to offer a bribe to a public official. Careful bookkeeping practices and auditing are basic to detecting and preventing bribery. Poor bookkeeping practices may represent another significant boundary to endeavors to diminish bribery (Wu, 2009). Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. Barth et al. (2009) also provide the same argument.

5.1.2.7 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (See Section 4.4.6). The result of the empirical analysis showed that crimes is positive which

shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.2 Determinants of Firm level Corruption in High Income Countries

5.2.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.3.

Table 5.3: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of High Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1044349	.3058482	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.8190309	.3850187	0	1
Taxation (TAX)	Binary Variable	.4922426	.4999719	0	1
Exporting Firm (EXPORT)	Percentage	7.806993	21.16505	0	100
Firm Age (FAGE)	Years	22.79703	19.66078	0	210
Firm Size (FSIZE)	Binary Variable	.5337385	.4989127	0	1
Manager Experience (MANEXP)	Years	21.17592	11.88807	1	70
External Audit (EXAUDIT)	Binary Variable	.5249144	.4994105	0	1
Crimes (CRIME)	Binary Variable	.2897196	.4536634	0	1

Table 5.3 explains that 10.44 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 81.90 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 49.22

percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 7.806. The average experience of the managers in the sample is 21.17 years while on average firms are 22.79 years older and 53.37 percent of firms are larger firms. In the sample of 147 countries, 52.49 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 28.97 percent of firms involved in crimes.

5.2.2 Results and Discussion: Disaggregated Analysis of High Income Countries

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation 5.1 are shown in Table 5.4. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.4: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of High Income Countries

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.3321049*	.0710528	4.67	0.000
Taxation (TAX)	.0026852*	.0010484	2.56	0.010
Exporting Firm (EXPORT)	-.109943	.1100399	-1.00	0.318
Firm Age (FAGE)	-.0088984*	.0017481	-5.09	0.000
Firm Size (FSIZE)	-.251856*	.0552538	-4.56	0.000
Manager Experience (MANEXP)	-.017228*	.0024709	-6.97	0.000
External Audit (EXAUDIT)	-.1659823*	.0545351	-3.04	0.002
Crimes (CRIME)	.6407795*	.0537105	11.93	0.000

Constant	-1.240618*	.1414747	-8.77	0.000
Observation	8032			
Overall Significance (F-value)	283.38			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.2.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural problem is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.2.2.2 Taxation and Firm level Corruption

Theoretically, the taxation may affect corruption positively. It was hypothesized in section 4.4.5 that taxation would result in an increase in corruption. The result of the logistic regression analysis has shown that the result of taxation is positive and significant, which explains that taxation increases the probability of corruption. Tax avoidance is a typical type of financial extortion among firms that are stood up to with a high tax rate (Palda, 2001). Opportunities for tax evasion provide firms having an incentive to bribe tax collectors to forget the fraud or to minimize the sanction, and that is why one might anticipate that firms facing large taxes could have higher propensity to pay bribes because firm considers tax as one of the major obstacles in the expansion of their business.

5.2.2.3 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is negative, which shows that the older firm is less likely to offer a bribe to a public official as compared to infant firms (Čábelková & Hanousek, 2004; Kuncoro, 2004).

5.2.2.4 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a greater propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is negative, which shows that a larger firm is less likely to offer a bribe to a public official in the case of higher-income countries.

5.2.2.5 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the result of manager experience is negative and statistically significant, which shows that the higher the manager experience, the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.2.2.6 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the coefficient of external audit is negative and statistically

significant, which shows that firms with an external audit are less likely to offer a bribe to a public official. Careful bookkeeping practices and auditing are basic to detecting and preventing bribery. Poor bookkeeping practices may represent another significant boundary to endeavors to diminish bribery (Wu, 2009). Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. Barth et al. (2009) also provide the same argument.

5.2.2.7 Crimes and Firm level Corruption

The theory suggested that crime of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (See Section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.3 Determinants of Firm level Corruption in Low Income Countries

5.3.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.5.

Table 5.5: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of Low Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2613075	.4393889	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.6108891	.4875892	0	1
Taxation	Binary Variable	.6697301	.4703445	0	1

(TAX)					
Exporting Firm (EXPORT)	Percentage	3.631987	15.17701	0	100
Firm Age (FAGE)	Years	14.96789	13.96702	0	125
Firm Size (FSIZE)	Binary Variable	.4922457	.5000174	0	1
Manager Experience (MANEXP)	Years	14.32124	9.818599	1	66
External Audit (EXAUDIT)	Binary Variable	.4619917	.4985891	0	1
Crimes (CRIME)	Binary Variable	.220573	.4146638	0	1

Table 5.5 explains that 26.13 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 61.08 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 66.97 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 3.6319. The average experience of the managers in the sample is 14.32 years while on average firms are 14.96 years older and 49.22 percent of firms are larger firms. In the sample of 147 countries, 46.19 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 22.05 percent of firms involved in crimes.

5.3.2 Results and Discussion: Disaggregated Analysis of Low Income Countries

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.6. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.6: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of Low Income Countries

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.3326605*	.0478742	6.95	0.000
Taxation (TAX)	.0001354	.0008082	0.17	0.867
Exporting Firm (EXPORT)	-.3978779*	.0637609	-6.24	0.000
Firm Age (FAGE)	.0071956*	.0018533	3.88	0.000
Firm Size (FSIZE)	-.0065255	.0478152	-0.14	0.891
Manager Experience (MANEXP)	-.0081879*	.0026166	-3.13	0.002
External Audit (EXAUDIT)	-.3069534*	.0490247	-6.26	0.000
Crimes (CRIME)	.4493355*	.0553461	8.12	0.000
Constant	-.1111226	.0714229	-1.56	0.120
Observation	7109			
Overall Significance (F-value)	212.64			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.3.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more

time with bureaucrats to avoid procedural hurdles is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.3.2.2 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.3.2.3 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is positive, which shows that the older firm is more likely to offer a bribe to a public official as compared to infant firms. The reason for positive impact of older firms on propensity to pay bribes may be due to weak institutions and high bureaucratic problem in lower income countries. It is corroborated from Table 1.2 that low income firms are highly involve in corruption and corrupt environment in low income countries induced older firm to obtain undue favor for enhancing firms' performance.

5.3.2.4 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression

indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.3.2.5 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the coefficient of external audit is negative and statistically significant, which shows that firms with an external audit are less likely to offer a bribe to a public official. Careful bookkeeping practices and auditing are basic to detecting and preventing bribery. Poor bookkeeping practices may represent another significant boundary to endeavors to diminish bribery (Wu, 2009). Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. Barth et al. (2009) also provide the same argument.

5.3.2.6 Crimes and Firm level Corruption

The theory suggested that the crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (see section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.4 Determinants of Firm level Corruption in Lower Middle Income Countries

5.4.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.7.

Table 5.7: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of Lower Middle Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2080248	.4059038	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.5251563	.4993759	0	1
Taxation (TAX)	Binary Variable	.5585118	.4965733	0	1
Exporting Firm (EXPORT)	Percentage	7.299973	22.53002	0	100
Firm Age (FAGE)	Years	19.17333	14.56994	0	211
Firm Size (FSIZE)	Binary Variable	.6036127	.4891579	0	1
Manager Experience (MANEXP)	Years	16.47949	10.56065	1	144
External Audit (EXAUDIT)	Binary Variable	.6251605	.4840899	0	1
Crimes (CRIME)	Binary Variable	.127917	.3340031	0	1

Table 5.7 explains that 20.80 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 52.51 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 55.85 percent of the firm reports that tax is a major constraint for their business. The average exports

of the firms are 7.2999. The average experience of the managers in the sample is 16.47 years while on average firms are 19.17 years older and 60.36 percent of firms are larger firms. In the sample of 147 countries, 62.51 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 12.79 percent of firms involved in crimes.

5.4.2 Results and Discussion: Disaggregated Analysis of Lower Middle Income Countries

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.8. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.8: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of Lower Middle Income Countries

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.3369902*	.0227947	14.78	0.000
Taxation (TAX)	.004112*	.0005188	7.93	0.000
Exporting Firm (EXPORT)	-.082565*	.0362772	-2.28	0.023
Firm Age (FAGE)	.0027158*	.0008502	3.19	0.001
Firm Size (FSIZE)	-.1161608*	.02267	-5.12	0.000
Manager Experience (MANEXP)	.0062036*	.0011436	5.42	0.000
External Audit (EXAUDIT)	-.3791054*	.0235233	-16.12	0.000
Crimes (CRIME)	.0734536*	.032955	2.23	0.026

Constant	-.4421695*	.0425007	-10.40	0.000
Observation	29414			
Overall Significance (F-value)	614.41			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.4.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural hurdles is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.4.2.2 Taxation and Firm level Corruption

Theoretically, the taxation may affect corruption positively. It was hypothesized in section 4.4.5 that taxation would result in an increase in corruption. The result of the logistic regression analysis has shown that the coefficient of taxation is positive and significant, which explains that taxation increases the probability of corruption. Tax avoidance is a typical type of financial extortion among firms that are stood up to with a high tax rate (Palda, 2001). Opportunities for tax evasion provide firms having an incentive to bribe tax collectors to forget the fraud or to minimize the sanction, and that is why one might anticipate that firms facing large taxes could have higher propensity to pay bribes because firm considers tax as one of the major obstacles in the expansion of their business.

5.4.2.3 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.4.2.4 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is positive, which shows that the older firm are more likely to offer a bribe to a public official as compared to infant firms. The reason for positive impact of older firms on propensity to pay bribes may be due to weak institutions and high bureaucratic problem in lower middle income countries.

5.4.2.5 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a greater propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is negative, which shows that a larger firm is less likely to offer a bribe to a public official in the case of lower middle income countries.

5.4.2.5 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is positive. It is corroborated from Table 1.2 that firms in lower middle nations are highly corrupted and these firms offer bribes to external auditor to clear their mismanaged account.

5.4.2.6 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the coefficient of external audit is negative and statistically significant, which shows that firms with an external audit are less likely to offer a bribe to a public official. Careful bookkeeping practices and auditing are basic to detecting and preventing bribery. Poor bookkeeping practices may represent another significant boundary to endeavors to diminish bribery (Wu, 2009). Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. Barth et al. (2009) also provide the same argument.

5.4.2.7 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (See Section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.5 Determinants of Firm level Corruption in Upper Middle Income Countries

5.5.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.9.

Table 5.9: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of upper middle income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1282188	.334346	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.634348	.4816269	0	1
Taxation (TAX)	Binary Variable	.4802347	.4996234	0	1
Exporting Firm (EXPORT)	Percentage	9.038397	22.96539	0	100
Firm Age (FAGE)	Years	19.21551	15.17522	0	340
Firm Size (FSIZE)	Binary Variable	.6297707	.4828852	0	1
Manager Experience (MANEXP)	Years	19.62492	11.10014	1	100
External Audit (EXAUDIT)	Binary Variable	.5477341	.4977306	0	1
Crimes (CRIME)	Binary Variable	.1651052	.3712859	0	1

Table 5.9 explains that 12.82 percent of firms are involved in bribery. For Bureaucratic problem, the firms reported that their senior management had spent 63.43 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 48.02

percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 9.038. The average experience of the managers in the sample is 19.62 years while on average firms are 19.21 years older and 62.97 percent of firms are larger firms. In the sample of 147 countries, 54.77 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 16.51 percent of firms involved in crimes.

5.5.2 Results and Discussion: Disaggregated Analysis of Upper Middle Income Countries

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.10. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.10: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of Upper Middle Income Countries

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.2159121*	.0309312	6.98	0.000
Taxation (TAX)	.0023641*	.000653	3.62	0.000
Exporting Firm (EXPORT)	-.474368*	.0498798	-9.51	0.000
Firm Age (FAGE)	-.0042243*	.0010683	-3.95	0.000
Firm Size (FSIZE)	.2325697*	.0313844	7.41	0.000
Manager Experience (MANEXP)	-.0135898*	.0014874	-9.14	0.000
External Audit (EXAUDIT)	-.0485704	.0301888	-1.61	0.108
Crimes (CRIME)	.5785249*	.0378293	15.29	0.000

Constant	-.5903466*	.0613783	-9.62	0.000
Observation	17905			
Overall Significance (F-value)	589.78			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.5.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural hurdles is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.5.2.2 Taxation and Firm level Corruption

Theoretically, the taxation may affect corruption positively. It was hypothesized in section 4.4.5 that taxation would result in an increase in corruption. The result of the logistic regression analysis has shown that the coefficient of taxation is positive and significant, which explains that taxation increases the probability of corruption. Tax avoidance is a typical type of financial extortion among firms that are stood up to with a high tax rate (Palda, 2001). Opportunities for tax evasion provide firms having an incentive to bribe tax collectors to forget the fraud or to minimize the sanction, and that is why one might anticipate that firms facing large taxes could have higher propensity to pay bribes because firm considers tax as one of the major obstacles in the expansion of their business.

5.5.2.3 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.5.2.4 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is negative, which shows that the older firm is less likely to offer a bribe to a public official as compared to infant firms (Čábelková & Hanousek, 2004; Kuncoro, 2004).

5.5.2.5 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a greater propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is positive, which shows that a larger firm are more likely to offer a bribe to a public official in the case of upper middle income countries.

5.5.2.6 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that mangers' experience reduces corruption. The result of logistic regression

indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.5.2.7 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (See Section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.6 Determinants of Firm level Corruption in East Asia & Pacific

5.6.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.11.

Table 5.11: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of East Asia & Pacific

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.3185163	.4659359	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.3602567	.4801014	0	1
Taxation (TAX)	Binary Variable	.4197653	.4935475	0	1
Exporting Firm (EXPORT)	Percentage	9.509216	24.58357	0	100
Firm Age	Years	16.73411	11.33944	0	161

(FAGE)					
Firm Size (FSIZE)	Binary Variable	.5816665	.4933137	0	1
Manager Experience (MANEXP)	Years	16.79616	9.422493	1	70
External Audit (EXAUDIT)	Binary Variable	.5267299	.4993119	0	1
Crimes (CRIME)	Binary Variable	.1042797	.3056391	0	1

Table 5.11 explains that 31.85 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 36.02 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 41.97 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 9.5092. The average experience of the managers in the sample is 16.79 years while on average firms are 16.73 years older and 58.16 percent of firms are larger firms. In the sample of 147 countries, 52.67 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 10.42 percent of firms involved in crimes.

5.6.2 Results and Discussion: Disaggregated Analysis of East Asia & Pacific

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the equation no 5.1 are shown in table 5.12. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.12: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of East Asia & Pacific

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
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Bureaucratic Problem (BUREAU)	.398443*	.0385604	10.33	0.000
Taxation (TAX)	.0081531*	.0008423	9.68	0.000
Exporting Firm (EXPORT)	-.1399239*	.0557444	-2.51	0.012
Firm Age (FAGE)	.0115629*	.0020015	5.78	0.000
Firm Size (FSIZE)	-.0342393	.0367479	-0.93	0.351
Manager Experience (MANEXP)	-.0149431*	.002296	-6.51	0.000
External Audit (EXAUDIT)	-.2355567*	.0381441	-6.18	0.000
Crimes (CRIME)	1.000806*	.0634598	15.77	0.000
Constant	-.1593191*	.0687966	-2.32	0.021
Observation	9643			
Overall Significance (F-value)	540.24			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.6.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural hurdles is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.6.2.2 Taxation and Firm level Corruption

Theoretically, the taxation may affect corruption positively. It was hypothesized in section 4.4.5 that taxation would result in an increase in corruption. The result of the logistic regression

analysis has shown that the coefficient of taxation is positive and significant, which explains that taxation increases the probability of corruption. Tax avoidance is a typical type of financial extortion among firms that are stood up to with a high tax rate (Palda, 2001). Opportunities for tax evasion provide firms having an incentive to bribe tax collectors to forget the fraud or to minimize the sanction, and that is why one might anticipate that firms facing large taxes could have higher propensity to pay bribes because firm considers tax as one of the major obstacles in the expansion of their business.

5.6.2.3 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.6.2.4 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (see section 4.4.10). The result regression analysis shows that the value of firm age is positive, which shows that the older firm is more likely to offer a bribe to a public official as compared to infant firms in East Asia & Pacific regions. The reason for positive effect of the involvement of the older firm on bribery activities due to corruption environment in this region. It is corroborated from Table 1.2 that Asian firms are high involve in paying informal payments to public officials.

5.6.2.5 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.6.2.6 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the coefficient of external audit is negative and statistically significant, which shows that firms with an external audit are less likely to offer a bribe to a public official. Careful bookkeeping practices and auditing are basic to detecting and preventing bribery. Poor bookkeeping practices may represent another significant boundary to endeavors to diminish bribery (Wu, 2009). Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. Barth et al. (2009) also provide the same argument.

5.6.2.7 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (See Section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be

involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.7 Determinants of Firm level Corruption in Eastern Europe & Central Asian

5.7.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.13.

Table 5.13: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of Eastern Europe & Central Asian

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1367046	.3435591	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.7756641	.4171684	0	1
Taxation (TAX)	Binary Variable	.2954472	.456268	0	1
Exporting Firm (EXPORT)	Percentage	7.416137	21.14733	0	100
Firm Age (FAGE)	Years	15.67353	13.14897	0	166
Firm Size (FSIZE)	Binary Variable	.4609989	.4985465	0	1
Manager Experience (MANEXP)	Years	17.12222	10.32399	1	100
External Audit (EXAUDIT)	Binary Variable	.3867655	.487035	0	1
Crimes (CRIME)	Binary Variable	.1561351	.3630036	0	1

Table 5.13 explains that 13.67 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 77.56 percent of the time on

average in dealing with requirements of government regulation with bureaucracy. Similarly, 29.54 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 7.4161. The average experience of the managers in the sample is 17.12 years while on average firms are 15.67 years older, and 46.09 percent of firms are larger firms. In the sample of 147 countries, 38.67 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 15.61 percent of firms involved in crimes.

5.7.2 Results and Discussion: Disaggregated Analysis of Eastern Europe & Central Asia

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.14. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.14: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of Eastern Europe & Central Asia

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.7583049*	.0568891	13.33	0.000
Taxation (TAX)	-.0006878	.0011943	-0.58	0.565
Exporting Firm (EXPORT)	-.4067492*	.12865	-3.16	0.002
Firm Age (FAGE)	.0026243	.002005	1.31	0.191
Firm Size (FSIZE)	-.1430988*	.0455364	-3.14	0.002
Manager Experience (MANEXP)	-.018144*	.0024349	-7.45	0.000
External Audit (EXAUDIT)	-.3154641*	.0482324	-6.54	0.000

Crimes (CRIME)	1.10102*	.0579943	18.98	0.000
Constant	-.8701374*	.1429718	-6.09	0.000
Observation	9724			
Overall Significance (F-value)	646.97			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.7.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural hurdles is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.7.2.2 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.7.2.3 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a less propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is negative, which shows that a larger firm is less likely to offer a bribe to a public official in the case of Eastern Europe & Central Asian Countries.

5.7.2.4 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.7.2.5 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the coefficient of external audit is negative and statistically significant, which shows that firms with an external audit are less likely to offer a bribe to a public official. Careful bookkeeping practices and auditing are basic to detecting and preventing bribery. Poor bookkeeping practices may represent another significant boundary to endeavors to diminish bribery (Wu, 2009). Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. Barth et al. (2009) also provide the same argument.

5.7.2.6 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (See Section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.8 Determinants of Firm level Corruption in Latin America & Caribbean

5.8.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.15.

Table 5.15: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of Latin America & Caribbean

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.080834	.2725996	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.7978384	.4016328	0	0
Taxation (TAX)	Binary Variable	.6935548	.4610399	0	1
Exporting Firm (EXPORT)	Percentage	6.085847	19.08216	0	100
Firm Age (FAGE)	Years	24.56304	19.49062	0	340
Firm Size (FSIZE)	Binary Variable	.619161	.4856206	0	1
Manager Experience (MANEXP)	Years	22.13606	12.26532	1	70
External Audit (EXAUDIT)	Binary Variable	.6003998	.4898407	0	1
Crimes	Binary Variable	.324611	.4682525	0	1

(CRIME)					
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Table 5.15 explains that 8.08 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 79.78 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 69.35 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 6.085. The average experience of the managers in the sample is 22.13 years while on average firms are 24.56 years older, and 61.91 percent of firms are larger firms. In the sample of 147 countries, 60.03 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 32.46 percent of firms involved in crimes.

5.8.2 Results and Discussion: Disaggregated Analysis of Latin America & Caribbean

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.16. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.16: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of Latin America & Caribbean

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.0603018	.0481696	1.25	0.211
Taxation (TAX)	-.0003953	.0007252	-0.55	0.586
Exporting Firm (EXPORT)	-.0231604	.0578856	-0.40	0.689

Firm Age (FAGE)	.0026883*	.0011028	2.44	0.015
Firm Size (FSIZE)	-.3677224*	.0412668	-8.91	0.000
Manager Experience (MANEXP)	-.0067855*	.0016454	-4.12	0.000
External Audit (EXAUDIT)	-.0996938*	.0402233	-2.48	0.013
Crimes (CRIME)	-.0238502	.0404002	-0.59	0.555
Constant	-.8731602*	.0807435	-10.81	0.000
	10143			
Overall Significance (F-value)	106.02			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.8.2.1 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is negative, which shows that the older firm is less likely to offer a bribe to a public official as compared to infant firms (Čábelková & Hanousek, 2004; Kuncoro, 2004).

5.8.2.2 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a less propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is positive, which shows that a larger firm are more likely to offer a bribe to a public official in the case of Latin America & Caribbean Countries.

5.8.2.3 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.8.2.4 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the coefficient of external audit is negative and statistically significant, which shows that firms with an external audit are less likely to offer a bribe to a public official. Careful bookkeeping practices and auditing are basic to detecting and preventing bribery. Poor bookkeeping practices may represent another significant boundary to endeavors to diminish bribery (Wu, 2009). Safavian et al., (2001) found that the possibility of paying bribes is lower for the firm that yearly inspects the book of accounts. Barth et al. (2009) also provide the same argument.

5.9 Determinants of Firm level Corruption in Middle East & North Africa

5.9.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion. Descriptive results of the disaggregated analysis are given in Table 5.17.

Table 5.17: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of the Middle East & North Africa

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.163276	.3696655	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.4375727	.4961452	0	1
Taxation (TAX)	Binary Variable	.5581552	.4966623	0	1
Exporting Firm (EXPORT)	Percentage	12.13958	27.34378	0	100
Firm Age (FAGE)	Years	22.26532	16.99041	0	211
Firm Size (FSIZE)	Binary Variable	.7577855	.4284908	0	1
Manager Experience (MANEXP)	Years	22.16495	11.71019	1	70
External Audit (EXAUDIT)	Binary Variable	.7274336	.4453289	0	1
Crimes (CRIME)	Binary Variable	.0739762	.261761	0	1

Table 5.17 explains that 16.32 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 43.75 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 55.81 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 12.139. The average experience of the managers in the sample is 22.16 years while on average firms are 22.26 years older, and 75.77 percent of firms are larger firms. In the sample of 147 countries, 72.74 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 7.39 percent of firms involved in crimes.

5.9.2 Results and Discussion: Disaggregated Analysis of Middle East & North Africa

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.18. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.18: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of the Middle East & North Africa

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.1547881*	.0597503	2.59	0.010
Taxation (TAX)	-.0000831	.0014137	-0.06	0.953
Exporting Firm (EXPORT)	-.3490662*	.1071824	-3.26	0.001
Firm Age (FAGE)	.0020317	.0019897	1.02	0.307
Firm Size (FSIZE)	.4131894*	.0707854	5.84	0.000
Manager Experience (MANEXP)	-.0056401*	.0028567	-1.97	0.048
External Audit (EXAUDIT)	-.0501213	.0672975	-0.74	0.456
Crimes (CRIME)	.5809159*	.1035741	5.61	0.000
Constant	-.9727137*	.1352557	-7.19	0.000
Observation	4567			
Overall Significance	91.22			0.000

(F-value)		
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* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.9.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural hurdles is more likely to pay bribes. Bureaucratic Problem are positively associated with corruption (Kuncoro, 2004).

5.9.2.2 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.9.2.3 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a less propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is positive, which shows that a larger firm are

more likely to offer a bribe to a public official in the case of Middle East & North Africa Countries.

5.9.2.4 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.9.2.5 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (see section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.10 Determinants of Firm level Corruption in OECD

5.10.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.19.

Table 5.19: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of OECD

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.0759659	.264987	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.7718584	.4197002	0	1
Taxation (TAX)	Binary Variable	.4386848	.4962997	0	1
Exporting Firm (EXPORT)	Percentage	9.874927	23.59751	0	100
Firm Age (FAGE)	Years	23.40076	18.42526	0	210
Firm Size (FSIZE)	Binary Variable	.5109235	.5000048	0	1
Manager Experience (MANEXP)	Years	22.3964	11.58822	1	70
External Audit (EXAUDIT)	Binary Variable	.5008881	.5000732	0	1
Crimes (CRIME)	Binary Variable	.2511013	.4337104	0	1

Table 5.19 explains that 7.59 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 77.18 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 43.86 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 9.8749. The average experience of the managers in the sample is 22.39 years while on average firms are 23.40 years older, and 51.09 percent of firms are larger firms. In the sample of 147 countries, 50.08 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 25.11 percent of firms involved in crimes.

5.10.2 Results and Discussion: Disaggregated Analysis of OECD

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.20. The variable of corruption has been captured through binary form, i.e., if the firm is

paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.20: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of OECD

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.1186769	.1008907	1.18	0.239
Taxation (TAX)	.0037038*	.0017816	2.08	0.038
Exporting Firm (EXPORT)	.2160262	.2457611	0.88	0.379
Firm Age (FAGE)	-.0121295*	.0036479	-3.33	0.001
Firm Size (FSIZE)	-.5245611*	.0943852	-5.56	0.000
Manager Experience (MANEXP)	-.0206639*	.0042171	-4.90	0.000
External Audit (EXAUDIT)	-.0222556	.0901675	-0.25	0.805
Crimes (CRIME)	-.0220286	.0969484	-0.23	0.820
Constant	-1.142766*	.2899591	-3.94	0.000
Observation	3433			
Overall Significance (F-value)	111.27			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.10.2.1 Taxation and Firm level Corruption

Theoretically, the taxation may affect corruption positively. It was hypothesized in section 4.4.5 that taxation would result in an increase in corruption. The result of the logistic regression analysis has shown that the coefficient of taxation is positive and significant, which explains that taxation increases the probability of corruption. Tax avoidance is a typical type of financial extortion among firms that are stood up to with a high tax rate (Palda, 2001). Opportunities for

tax evasion provide firms having an incentive to bribe tax collectors to forget the fraud or to minimize the sanction, and that is why one might anticipate that firms facing large taxes could have higher propensity to pay bribes because firm considers tax as one of the major obstacles in the expansion of their business.

5.10.2.2 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is negative, which shows that the older firm is less likely to offer a bribe to a public official as compared to infant firms (Čábelková & Hanousek, 2004; Kuncoro, 2004).

5.10.2.3 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a less propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is negative, which shows that a larger firm is less likely to offer a bribe to a public official in the case of OECD Countries.

5.10.2.4 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.11 Determinants of Firm level Corruption in South Asian

5.11.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.21.

Table 5.21: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of South Asian

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1793872	.383694	0	1
Bureaucratic Problem (BUREAU)	Binary Variable	.4985262	.5000172	0	1
Taxation (TAX)	Binary Variable	.6120012	.4873124	0	1
Exporting Firm (EXPORT)	Percentage	7.251749	22.88567	0	100
Firm Age (FAGE)	Years	19.75105	14.39691	0	162
Firm Size (FSIZE)	Binary Variable	.6094244	.4879028	0	1
Manager Experience (MANEXP)	Years	14.56887	9.811464	0	71
External Audit (EXAUDIT)	Binary Variable	.7147851	.4515335	0	1
Crimes (CRIME)	Binary Variable	.0661951	.2486321	0	1

Table 5.21 explains that 17.93 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 49.85 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 61.20 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 7.2517. The average experience of the managers in the sample is 14.56 years while on average firms are 19.75 years older, and 60.94 percent of firms are larger firms.

In the sample of 147 countries, 71.47 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 6.61 percent of firms involved in crimes.

5.11.2 Results and Discussion: Disaggregated Analysis of South Asian

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.22. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.22: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of South Asian

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.7136195*	.0356696	20.01	0.000
Taxation (TAX)	.0076448*	.0020778	3.68	0.000
Exporting Firm (EXPORT)	-.3776762*	.0579639	-6.52	0.000
Firm Age (FAGE)	-.0042236*	.0013096	-3.23	0.001
Firm Size (FSIZE)	-.1421115*	.0355026	-4.00	0.000
Manager Experience (MANEXP)	.0177803*	.0019681	9.03	0.000
External Audit (EXAUDIT)	-.6257156*	.0384225	-16.29	0.000
Crimes (CRIME)	.3081813*	.0670555	4.60	0.000
Constant	-.4315921*	.0665212	-6.49	0.000
Observation	13725			
Overall Significance (F-value)	864.86			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.11.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural hurdles is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.11.2.2 Taxation and Firm level Corruption

Theoretically, the taxation may affect corruption positively. It was hypothesized in section 4.4.5 that taxation would result in an increase in corruption. The result of the logistic regression analysis has shown that the coefficient of taxation is positive and significant, which explains that taxation increases the probability of corruption. Tax avoidance is a typical type of financial extortion among firms that are stood up to with a high tax rate (Palda, 2001). Opportunities for tax evasion provide firms having an incentive to bribe tax collectors to forget the fraud or to minimize the sanction, and that is why one might anticipate that firms facing large taxes could have higher propensity to pay bribes because firm considers tax as one of the major obstacles in the expansion of their business.

5.11.2.3 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the

hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.11.2.4 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is negative, which shows that the older firm is less likely to offer a bribe to a public official as compared to infant firms (Čábelková & Hanousek, 2004; Kuncoro, 2004).

5.11.2.5 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a less propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is negative, which shows that a larger firm is less likely to offer a bribe to a public official in the case of South Asian Countries.

5.11.2.6 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that managers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is negative and statistically significant, which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.11.2.7 External Audit and Firm level Corruption

Theoretically, reconciliation of accounts and corruption are negatively associated. It was hypothesized in section 4.4.13 that external audit has a negative impact on corruption. The regression result shows that the coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to offer a bribe to a public official. It is corroborated from Table 1.2 that South Asian firms are highly corrupted and these firms offer bribes to external auditor to clear their mismanaged account.

5.11.2.8 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (see section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

5.12 Determinants of Firm level Corruption in Sub-Saharan Africa

5.12.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 5.23.

Table 5.23: Descriptive Statistics of the Variables of Determinants of Firm level Corruption: Disaggregated Analysis of Sub-Saharan Africa

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2162866	.4117388	0	1
Bureaucratic Problem	Binary Variable	.6364995	.4810348	0	1

(BUREAU)					
Taxation (TAX)	Binary Variable	.6552002	.4753269	0	1
Exporting Firm (EXPORT)	Percentage	4.240978	16.15408	0	100
Firm Age (FAGE)	Years	16.08691	14.4654	0	166
Firm Size (FSIZE)	Binary Variable	.5893393	.4919999	0	1
Manager Experience (MANEXP)	Years	15.74541	10.34309	1	144
External Audit (EXAUDIT)	Binary Variable	.5188512	.4996692	0	1
Crimes (CRIME)	Binary Variable	.2264151	.4185318	0	1

Table 5.23 explains that 21.62 percent of firms are involved in bribery. For bureaucratic problem, the firms reported that their senior management had spent 63.64 percent of the time on average in dealing with requirements of government regulation with bureaucracy. Similarly, 65.52 percent of the firm reports that tax is a major constraint for their business. The average exports of the firms are 4.2409. The average experience of the managers in the sample is 15.74 years while on average firms are 19.75 years older, and 60.94 percent of firms are larger firms. In the sample of 147 countries, 51.88 percent of firms reported that external auditors reconciled their income statements and balance sheets. Similarly, 26.64 percent of firms involved in crimes.

5.12.2 Results and Discussion: Disaggregated Analysis of Sub-Saharan Africa

To see the determinants of corruption in a firm, the binary logistic model has been applied for the sample of 147 countries (disaggregated analysis). The results of the Equation no 5.1 are shown in Table 5.24. The variable of corruption has been captured through binary form, i.e., if the firm is paying a bribe, it is coded as one otherwise zero. The majority of the results are according to the theory and supported by the existing literature.

Table 5.24: Regression Results of Determinants of Firm level Corruption: Disaggregated Analysis of Sub-Saharan Africa

Variables	Coefficient	Standard Error	Z Statistics	Probability Value
Bureaucratic Problem (BUREAU)	.1653823	.0404676	4.09	0.000
Taxation (TAX)	.0010318	.0006281	1.64	0.100
Exporting Firm (EXPORT)	-.3163796	.0530141	-5.97	0.000
Firm Age (FAGE)	.0069777	.0014498	4.81	0.000
Firm Size (FSIZE)	-.2179102	.0388421	-5.61	0.000
Manager Experience (MANEXP)	-.0039469	.0020344	-1.94	0.052
External Audit (EXAUDIT)	-.0570943	.0401543	-1.42	0.155
Crimes (CRIME)	.4210942	.0446573	9.43	0.000
Constant	-.3290919	.0615443	-5.35	0.000
Observation	10354			
Overall Significance (F-value)	204.66			0.000

* Indicates significant at 5% level. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

5.12.2.1 Bureaucratic Problem and Firm level Corruption

The bureaucratic hurdle may explain the involvement of the firm in corruption. It was hypothesized that bureaucratic problem increase firms' involvement in bribery (See Section 4.4.4). The result has shown that it has a positive and significant coefficient, which shows that bureaucratic problem increase the likelihood of corruption. The results are according to the hypothesis and supported by the literature. According to Svensson (1999) firm that spent more time with bureaucrats to avoid procedural problem is more likely to pay bribes. Bureaucratic problem are positively associated with corruption (Kuncoro, 2004).

5.12.2.2 Exporting Firm and Firm level Corruption

Theoretically, the exporting firm and bribery are inversely related to each other. Section 4.4.15 hypothesized that exporting firm had a negative effect on bribe payments. The regression shows the negative effect of exporting firm, which indicate that firms that export their output are less likely to offer a bribe to a public official to get things done. The results are according to the hypothesis and supported by the literature. The exporting firms has less tendency to bribe (Luo and Han, 2009). Exporting firm has less interaction with public official so have less probability of involvement in corruption (Barth et al., 2009).

5.12.2.3 Firm Age and Firm level Corruption

The theory suggested that the age of the firm significantly induces firms' involvement in corruption. It was hypothesized the age of the firm reduces the likelihood of corruption (See Section 4.4.10). The result regression analysis shows that the value of firm age is positive. The firms in Sub-Saharan Africa regions are also highly corrupted due to the corruption environment that prevail in this region as corroborated in Table 1.2.

5.12.2.4 Firm Size and Firm level Corruption

The theory suggested that medium and larger firms have a less propensity to bribe as compared to smaller firms. It was hypothesized that larger firms pay less bribes (See Section 4.4.11). The result of logistic regression shows that firm size is negative, which shows that a larger firm is less likely to offer a bribe to a public official in the case of Sub Saharan African countries.

5.12.2.5 Manager Experience and Firm level Corruption

The experience of the manager is significantly associated with firm level corruption. Section 4.4.12 supposed that mangers' experience reduces corruption. The result of logistic regression indicates that the coefficient of manager experience is negative and statistically significant,

which shows that the higher the manager experience the lower will be the probability of corruption. The results are according to the hypothesis and supported by the literature. This result is in line with the finding of Collins et al. (2009).

5.12.2.6 Crimes and Firm level Corruption

The theory suggested that crimes of the firms and the probability of corruption are positively correlated with each other. It was hypothesized that crimes has a positive impact on corruption (see section 4.4.6). The result of the empirical analysis showed that crimes is positive which shows that firms that experience losses as a result of theft or robbery are more likely to be involved in corrupt practices. According to Goldberg, Kim, & Ariano (2014), firms identify crimes as one of the major barriers to doing business.

Chapter 6

Results and Discussion: The Effects of Corruption on Firms' Performance

This chapter provides results of the descriptive statistics and the regression results of the impact of corruption on firms' performance. In this chapter, we have provided the answer to our second research question. This chapter meets the second objective to estimate the impact of corruption on firms' performance in a panel of global economies, global income groups, and global regional groups.

6.1 The Effects of Corruption on Firms' Performance in Aggregate Analysis

6.1.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the aggregate analysis are given in Table 6.1.

Table 6.1: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Aggregate Analysis

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1778109	.3823576	0	1
Public Listed Company (PLCOMP)	Binary Variable	.3575508	.4818297	0	1
Foreign Firms (FORFIRM)	Percentage	6.885258	23.30099	0	100
Firm Age (FAGE)	Years	19.1769	15.54594	0	340
Firm Size (FSIZE)	Binary Variable	.5950355	.490891	0	1
Manager Experience (MANEXP)	Years	17.7321	11.0299	0	144
External Audit (EXAUDIT)	Binary Variable	.5715643	.4948561	0	1
Skilled Workers	Numbers	68.45974	306.9713	0	19000

(SWORK)					
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Table 6.1 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in aggregate analysis. It explains that 17.8 percent of firms are involved in bribery. For publicly listed companies, 35.75 percent of firms are public listed companies. On average, 6.885 percent of the firm are foreign-owned. On average firms are 19.17 years older and 59.50 percent of firms are larger firms. The average experience of the managers in the sample is 17.73 years. For external audits, 57.1 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 68.45.

6.1.2 Results and Discussion: Aggregate Analysis

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (aggregate analysis). The results of the Equation No 4.3 are shown in Table 6.2. The variable of firms' performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.2: Regression Results of the Effects of Corruption on Firms' Performance: Aggregate Analysis

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.2154079*	.0153904	14.00	0.000
Public Listed Company (PLCOMP)	.2013895*	.0118419	17.01	0.000
Foreign Firms (FORFIRM)	.0043799*	.0002713	16.14	0.000
Firm Age (FAGE)	.0108132*	.0004139	26.13	0.000
Firm Size (FSIZE)	.4834766*	.0123195	39.24	0.000

Manager Experience (MANEXP)	.0010146**	.0005626	1.80	0.071
External Audit (EXAUDIT)	.3410066*	.012177	28.00	0.000
Skilled Workers (SWORK)	.000781*	.0000491	15.92	0.000
Constant	6.62257*	.0168311	393.47	0.000
Observation	62460			
Overall Significance (F-value)	807.99			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.1.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm's performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.4.1). The result indicates that corruption increase firms' annual sales. Our results confirm the grease the wheel hypothesis in case of the aggregate analysis of the global economies. One reason for the positive association between corruption and firms' performance is due to bureaucratic complexities that the firm faces while dealing with public officials to get things done. Our results are in line with the findings of the Jiang and Nie (2014). Another reason for the positive association between corruption and firms' performance may be due to the sample bias because, in the case of aggregate analysis, out of 147 countries, 117 countries are either lower or middle income. These nations face greater bureaucratic problem and have weak institutions which induced the firms to indulge in informal payment to reduce the problem of red tape (Wang and You, 2012).

6.1.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.1.2.3 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.1.2.4 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.1.2.5 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of

firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.1.2.6 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.1.2.7 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.1.2.8 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.2 The Effects of Corruption on Firms' Performance in High Income Countries

6.2.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.3.

Table 6.3: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of High Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1044349	.3058482	0	1
Public Listed Company (PLCOMP)	Binary Variable	.1490941	.3562036	0	1
Foreign Firms (FORFIRM)	Percentage	8.238461	25.95815	0	100
Firm Age (FAGE)	Years	22.79703	19.66078	0	210
Firm Size (FSIZE)	Binary Variable	.5337385	.4989127	0	1
Manager Experience (MANEXP)	Years	21.17592	11.88807	1	70
External Audit (EXAUDIT)	Binary Variable	.5249144	.4994105	0	1
Skilled Workers (SWORK)	Numbers	51.65708	189.821	0	6754

Table 6.3 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 10.44 percent of firms are involved in bribery. For publicly listed companies, 14.90 percent firms are public listed companies. On average, 8.23 percent of firms are foreign-owned. On average firms are 22.79 years older and 53.37 percent of firms are larger firms. The average experience of the managers in the sample is 21.17 years. For external audits, 52.49 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 51.65.

6.2.2 Results and Discussion: Disaggregated Analysis of High Income Countries

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.4. The variable of the firm's performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.4: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of High Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-.4750701*	.0621591	-7.64	0.000
Public Listed Company (PLCOMP)	.0502469	.0446336	-1.13	0.260
Foreign Firms (FORFIRM)	.0030626*	.0006961	4.40	0.000
Firm Age (FAGE)	.0127844*	.0008267	15.47	0.000
Firm Size (FSIZE)	1.253713*	.0417899	30.00	0.000
Manager Experience (MANEXP)	.0105537*	.0013743	7.68	0.000
External Audit (EXAUDIT)	.3197653*	.0360854	8.86	0.000
Skilled Workers (SWORK)	.0009391*	.0001933	4.86	0.000
Constant	5.874072*	.0468585	125.36	0.000
Observation	8032			
Overall Significance (F-value)	306.49			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.2.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). Corruption has a negative and significant coefficient, which confirms the inverse relationship between corruption and annual real sale growth. It is corroborated from Table 1.2 that high income countries pay only 10.44 percent of their annual total sale as bribes. The firms in the high income nation are more efficient. They consider corruption as hurdle in the growth of firms. Our results confirm sand the wheel hypothesis in case of the disaggregated analysis of the higher income countries. Fisman and Svensson (2007) provide the same results. Because they believe that gifts and bribe payment to government officials reduces the firm annual sales of the firms. The bribery has an overall negative impact on the economy.

6.1.2.2 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.2.2.3 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.2.2.4 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.2.2.5 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.2.2.6 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.2.2.7 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.3 The Effects of Corruption on Firms' Performance in Low Income Countries

6.3.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.5.

Table 6.5: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of Low Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2613075	.4393889	0	1
Public Listed Company (PLCOMP)	Binary Variable	.5819267	.4932782	0	1
Foreign Firms (FORFIRM)	Percentage	11.89507	29.57028	0	100
Firm Age (FAGE)	Years	14.96789	13.96702	0	125
Firm Size (FSIZE)	Binary Variable	.4922457	.5000174	0	1
Manager Experience (MANEXP)	Years	14.32124	9.818599	1	66
External Audit (EXAUDIT)	Binary Variable	.4619917	.4985891	0	1
Skilled Workers (SWORK)	Numbers	37.98175	177.1464	0	6100

Table 6.5 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 26.13 percent of firms are involved in bribery. For publicly listed companies, 58.19 percent of firms are public listed

companies. On average, 11.89 percent of the firm are foreign-owned. On average firms are 14.96 years older and 49.22 percent of firms are larger firms. The average experience of the managers in the sample is 14.32 years. For external audits, 46.19 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 37.98.

6.3.2 Results and Discussion: Disaggregated Analysis of Low Income Countries

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.6. The variable of the firm's performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.6: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of Low Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.2147584*	.0374801	5.73	0.000
Public Listed Company (PLCOMP)	.0738993*	.0352845	2.09	0.036
Foreign Firms (FORFIRM)	.0011967**	.0006424	1.86	0.063
Firm Age (FAGE)	.0058724*	.0014652	4.01	0.000
Firm Size (FSIZE)	.3027504*	.0339019	8.93	0.000
Manager Experience (MANEXP)	.0172562*	.0018993	9.09	0.000
External Audit (EXAUDIT)	.4509124*	.0342131	13.18	0.000
Skilled Workers (SWORK)	.0018229*	.000236	7.72	0.000

Constant	6.337056*	.0449486	140.98	0.000
Observation	7109			
Overall Significance (F-value)	93.41			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.3.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). Corruption has a positive coefficient, which shows the positive relationship between corruption and annual real sale growth. Our results confirm the grease the wheel hypothesis in case of the disaggregated analysis of the lower income countries. It is corroborated from Table 1.2 that low income countries pay 26.13 percent of their total sales as bribes. The firms in low income nations are less efficient and they consider bribes as perk for growth of the firms. Our results are in line with the findings of (Jiang and Nie 2014; Blagojević and Damijan, 2013; Wang and You 2012).

6.3.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.3.2.3 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.3.2.4 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.3.2.5 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.3.2.6 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.3.2.7 External Audit and Firm Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.3.2.8 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.4 The Effects of Corruption on Firms' Performance in Lower Middle Income Countries

6.4.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.7.

Table 6.7: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of Lower Middle Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2080248	.4059038	0	1
Public Listed Company (PLCOMP)	Binary Variable	.4549011	.5032047	0	1
Foreign Firms (FORFIRM)	Percentage	5.552751	21.11622	0	100
Firm Age (FAGE)	Years	19.17333	14.56994	0	211
Firm Size (FSIZE)	Binary Variable	.6036127	.4891579	0	1

Manager Experience (MANEXP)	Years	16.47949	10.56065	1	144
External Audit (EXAUDIT)	Binary Variable	.6251605	.4840899	0	1
Skilled Workers (SWORK)	Numbers	72.96929	308.9429	0	14000

Table 6.7 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 20.80 percent of firms are involved in bribery. For publicly listed companies, 45.49 percent of firms are public listed companies. On average, 5.55 percent of the firm are foreign-owned. On average firms are 19.17 years older and 60.36 percent of firms are larger firms. The average experience of the managers in the sample is 16.47 years. For external audit 62.51 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 72.96.

6.4.2 Results and Discussion: Disaggregated Analysis of Lower Middle Income Countries

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.8. The variable of firm's performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.8: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of Lower Middle Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
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Corruption (CORRP)	.356245*	.0201557	17.67	0.000
Public Listed Company (PLCOMP)	.3343359*	.0163251	20.48	0.000
Foreign Firms (FORFIRM)	.0056282*	.0004167	13.51	0.000
Firm Age (FAGE)	.0060892*	.0005936	10.26	0.000
Firm Size (FSIZE)	.1953379*	.0163548	11.94	0.000
Manager Experience (MANEXP)	-.004018*	.0008006	-5.02	0.000
External Audit (EXAUDIT)	.1054963*	.0176233	5.99	0.000
Skilled Workers (SWORK)	.0011229*	.0000716	15.68	0.000
Constant	7.294845*	.0254048	287.14	0.000
Observation	29414			
Overall Significance (F-value)	271.06			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.4.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). Corruption has positive coefficient which confirm the positive relationship between corruption and annual real sale growth. Our results confirm the grease the wheel hypothesis in case of the disaggregated analysis of lower middle income countries. The firms in the lower middle income are also not much efficient and face problem of red tape so they consider bribes as grease money. It is corroborated from Table 1.2 that lower middle firm pays 20.80 percent of their annual total sales as corruption to get things done. One reason for the positive association between corruption and firm performance is due to bureaucratic complexities that firm faces while dealing with

public officials to get things done. Our results are in line with the findings of the Wang and You (2012).

6.4.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.4.2.3 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.4.2.4 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.4.2.5 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.4.2.6 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.4.2.7 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.4.2.8 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.5 The Effects of Corruption on Firms' Performance in Upper Middle Income Countries

6.5.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.9.

Table 6.9: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of Upper Middle Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1282188	.334346	0	1
Public Listed Company (PLCOMP)	Binary Variable	.2077165	.4056841	0	1
Foreign Firms (FORFIRM)	Percentage	6.513401	22.37956	0	100
Firm Age (FAGE)	Years	19.21551	15.17522	0	340
Firm Size (FSIZE)	Binary Variable	.6297707	.4828852	0	1
Manager Experience (MANEXP)	Years	19.62492	11.10014	1	100
External Audit (EXAUDIT)	Binary Variable	.5477341	.4977306	0	1
Skilled Workers (SWORK)	Numbers	74.28877	360.7692	0	19000

Table 6.9 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 12.82 percent of firms are involved in bribery. For publicly listed companies, 20.77 percent of firms are public listed companies. On average, 6.51 percent of the firm are foreign-owned. On average firms are 19.21 years older and 62.97 percent of firms are larger firms. The average experience of the managers

in the sample is 19.62 years. For external audits, 54.77 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 74.28.

6.5.2 Results and Discussion: Disaggregated Analysis of Upper Middle Income Countries

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.10. The variable of firm's performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.10: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of Upper Middle Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-.0409001	.0288104	-1.42	0.156
Public Listed Company (PLCOMP)	.4217692*	.0236906	17.80	0.000
Foreign Firms (FORFIRM)	.0038831*	.0005056	7.68	0.000
Firm Age (FAGE)	.011702*	.0009001	13.00	0.000
Firm Size (FSIZE)	.6448129*	.0236524	27.26	0.000
Manager Experience (MANEXP)	.0046276*	.0011009	4.20	0.000
External Audit (EXAUDIT)	.4524433*	.0219062	20.65	0.000
Skilled Workers (SWORK)	.0003277*	.0000395	8.29	0.000
Constant	6.308976*	.0299427	210.70	0.000
Observation	17905			
Overall Significance (F-value)	358.14			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.5.2.1 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.5.2.2 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.5.2.3 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.5.2.4 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.5.2.5 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.5.2.6 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.5.2.7 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.6 The Effects of Corruption on Firms' Performance in East Asia & Pacific

6.6.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.11.

Table 6.11: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of East Asia & Pacific

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.3185163	.4659359	0	1
Public Listed Company (PLCOMP)	Binary Variable	.4287348	.4949209	0	1
Foreign Firms (FORFIRM)	Percentage	7.271307	23.33793	0	100
Firm Age (FAGE)	Years	16.73411	11.33944	0	161
Firm Size (FSIZE)	Binary Variable	.5816665	.4933137	0	1
Manager Experience (MANEXP)	Years	16.79616	9.422493	1	70

External Audit (EXAUDIT)	Binary Variable	.5267299	.4993119	0	1
Skilled Workers (SWORK)	Numbers	111.2007	507.8935	0	19000

Table 6.11 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 31.85 percent of firms are involved in bribery. For publicly listed companies, 42.87 percent of firms are public listed companies. On average, 7.27 percent of the firm are foreign-owned. On average firms are 16.73 years older and 58.16 percent of firms are larger firms. The average experience of the managers in the sample is 16.79 years. For external audit 52.67 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 111.20.

6.6.2 Results and Discussion: Disaggregated Analysis of East Asia & Pacific

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.12. The variable of firm's performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.12: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of East Asia & Pacific

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.3742874*	.0345274	10.84	0.000
Public Listed Company (PLCOMP)	.0432245	.0285191	1.52	0.130

Foreign Firms (FORFIRM)	.0051525*	.0006366	8.09	0.000
Firm Age (FAGE)	.0094253*	.00157	6.00	0.000
Firm Size (FSIZE)	.117566*	.03026	3.89	0.000
Manager Experience (MANEXP)	.0072313*	.0017993	4.02	0.000
External Audit (EXAUDIT)	-.2268151*	.0291152	-7.79	0.000
Skilled Workers (SWORK)	.0004981*	.0000651	7.65	0.000
Constant	7.507084*	.0448191	167.50	0.000
Observation	9643			
Overall Significance (F-value)	64.51			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.6.2.1 Corruption and Firm Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). In the case of Asia corruption has a positive and significant coefficient, which confirm the positive relationship between corruption and annual real sale growth (Jiang and Nie 2014; Blagojević and Damijan, 2013; Wang and You 2012). The empirical literature strongly confirms this result because East Asian countries experience high growth along with high corruption "Asian Paradox". It is also corroborated from Table 1.2 that firms in this group of countries pays 31.85 percent of their total annual sales as bribes.

6.6.2.2 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section

4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.6.2.3 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.6.2.4 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.6.2.5 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.6.2.6 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.6.2.7 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.7 The Effects of Corruption on Firms' Performance in Eastern Europe & Central Asia

6.7.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.13.

Table 6.13: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of Eastern Europe & Central Asia

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1367046	.3435591	0	1
Public Listed Company (PLCOMP)	Binary Variable	.0954218	.293812	0	1
Foreign Firms (FORFIRM)	Percentage	5.074802	19.79966	0	100
Firm Age (FAGE)	Years	15.67353	13.14897	0	166
Firm Size (FSIZE)	Binary Variable	.4609989	.4985465	0	1

Manager Experience (MANEXP)	Years	17.12222	10.32399	1	100
External Audit (EXAUDIT)	Binary Variable	.3867655	.487035	0	1
Skilled Workers (SWORK)	Numbers	63.43031	214.5642	0	6754

Table 6.13 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in aggregate analysis. It explains that 13.67 percent of firms are involved in bribery. For publicly listed companies, 9.54 percent of firms are public listed companies. On average, 5.07 percent of the firm are foreign-owned. On average firms are 15.67 years older and 46.09 percent of firms are larger firms. The average experience of the managers in the sample is 17.12 years. For external audits, 38.67 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 63.43.

6.7.2 Results and Discussion: Disaggregated Analysis of Eastern Europe & Central Asia

To see the effect of the corruption on firms' performance, ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.14. The variable of the firm's performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.14: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of Eastern Europe & Central Asia

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.2794362*	.0444358	6.29	0.000
Public Listed Company (PLCOMP)	.8257342*	.0695681	11.87	0.000
Foreign Firms (FORFIRM)	.0050131*	.0009669	5.18	0.000
Firm Age (FAGE)	.0071425*	.0014998	4.76	0.000
Firm Size (FSIZE)	.1588361*	.0359848	4.41	0.000
Manager Experience (MANEXP)	.0168276*	.0018593	9.05	0.000
External Audit (EXAUDIT)	.1921918*	.0397717	4.83	0.000
Skilled Workers (SWORK)	.0013839*	.0001362	10.16	0.000
Constant	6.59673*	.0422379	156.18	0.000
Observation	9724			
Overall Significance (F-value)	71.37			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.7.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). Corruption has a positive and significant coefficient, which confirm the positive relationship between corruption and annual real sale growth. Our results confirm the grease the wheel hypothesis in case of the disaggregated analysis of Eastern Europe & Central Asian countries. Our results are in line with the findings of the Jiang and Nie (2014).

6.7.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.7.2.3 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.7.2.4 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.7.2.5 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of

firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.7.2.6 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.7.2.7 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.7.2.8 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.8 The Effects of Corruption on Firm Performance in Latin America & Caribbean

6.8.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.15.

Table 6.15: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of Latin America & Caribbean

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.080834	.2725996	0	1
Public Listed Company (PLCOMP)	Binary Variable	.2018793	.4014225	0	1
Foreign Firms (FORFIRM)	Percentage	8.906151	26.70014	0	100
Firm Age (FAGE)	Years	24.56304	19.49062	0	340
Firm Size (FSIZE)	Binary Variable	.619161	.4856206	0	1
Manager Experience (MANEXP)	Years	22.13606	12.26532	1	70
External Audit (EXAUDIT)	Binary Variable	.6003998	.4898407	0	1
Skilled Workers (SWORK)	Numbers	43.15743	210.788	0	8762

Table 6.15 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 17.8 percent of firms are involved in bribery. For publicly listed companies, 20.18 percent of firms are public listed companies. On average, 8.90 percent of the firm are foreign-owned. On average firms are 24.56 years older and 61.91 percent of firms are larger firms. The average experience of the managers in the sample is 22.13 years. For external audits, 60.03 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 43.15.

6.8.2 Results and Discussion: Disaggregated Analysis of Latin America & Caribbean

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.16. The variable of firms' performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.16: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of Latin America & Caribbean

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-.2658116*	.0406521	-6.54	0.000
Public Listed Company (PLCOMP)	.9175361*	.02939	31.22	0.000
Foreign Firms (FORFIRM)	.0037879*	.0004991	7.59	0.000
Firm Age (FAGE)	.0071331*	.0007233	9.86	0.000
Firm Size (FSIZE)	.8181203*	.0272488	30.02	0.000
Manager Experience (MANEXP)	.004077*	.0010726	3.80	0.000
External Audit (EXAUDIT)	.2594087*	.0258842	10.02	0.000
Skilled Workers (SWORK)	.0007934*	.0000906	8.75	0.000
Constant	6.700122*	.0346094	193.59	0.000
Observation	10143			
Overall Significance (F-value)	491.23			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.8.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). Corruption has a negative and significant coefficient, which confirm the negative relationship between corruption and annual real sale growth. Our results confirm the sand the wheel hypothesis in case of the disaggregated analysis of Latin America & Caribbean countries.

6.8.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.8.2.3 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.8.2.4 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which

indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.8.2.5 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.8.2.6 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.8.2.7 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.8.2.8 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.9 The Effects of Corruption on Firms' Performance in the Middle East & North Africa

6.9.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.17.

Table 6.17: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of the Middle East & North Africa

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.163276	.3696655	0	1
Public Listed Company (PLCOMP)	Binary Variable	.3248071	.4683544	0	1
Foreign Firms (FORFIRM)	Percentage	6.18567	21.89537	0	100
Firm Age (FAGE)	Years	22.26532	16.99041	0	211
Firm Size (FSIZE)	Binary Variable	.7577855	.4284908	0	1
Manager Experience (MANEXP)	Years	22.16495	11.71019	1	70
External Audit (EXAUDIT)	Binary Variable	.7274336	.4453289	0	1
Skilled Workers (SWORK)	Numbers	69.86991	249.8739	0	8000

Table 6.17 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 16.32 percent of firms are involved in bribery. For publicly listed companies, 32.48 percent of firms are public listed companies. On average, 6.18 percent of the firm are foreign-owned. On average firms are 22.26 years older and 75.77 percent of firms are larger firms. The average experience of the managers in the sample is 22.16 years. For external audits, 72.74 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 69.86.

6.9.2 Results and Discussion: Disaggregated Analysis of the Middle East & North Africa

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.18. The variable of firms' performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.18: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of the Middle East & North Africa

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.7047473*	.0495413	14.23	0.000
Public Listed Company (PLCOMP)	.1392568*	.0406518	3.43	0.001
Foreign Firms (FORFIRM)	.0011073	.0008193	1.35	0.177
Firm Age (FAGE)	.0095026*	.0013118	7.24	0.000
Firm Size (FSIZE)	.8411334*	.0404037	20.82	0.000

Manager Experience (MANEXP)	.0075128*	.0017781	4.23	0.000
External Audit (EXAUDIT)	.3921638*	.0402063	9.75	0.000
Skilled Workers (SWORK)	.0007735*	.0001834	4.22	0.000
Constant	5.612566*	.0611939	91.72	0.000
Observation	4567			
Overall Significance (F-value)	147.43			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.9.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See section 4.2.1). Corruption has a positive and significant coefficient, which confirm the positive relationship between corruption and annual real sale growth. Our results confirm the grease the wheel hypothesis in case of the disaggregated analysis of the Middle East & North Africa countries. Our results are in line with the findings of the Jiang and Nie (2014).

6.9.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.9.2.3 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.9.2.4 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.9.2.5 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.9.2.6 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.9.2.7 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.10 The Effects of Corruption on Firms' Performance in OECD

6.10.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.19.

Table 6.19: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of OECD

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.0759659	.264987	0	1
Public Listed Company (PLCOMP)	Binary Variable	.1962063	.3971853	0	1
Foreign Firms (FORFIRM)	Percentage	9.352457	27.78058	0	100
Firm Age (FAGE)	Years	23.40076	18.42526	0	210
Firm Size (FSIZE)	Binary Variable	.5109235	.5000048	0	1
Manager Experience (MANEXP)	Years	22.3964	11.58822	1	70
External Audit (EXAUDIT)	Binary Variable	.5008881	.5000732	0	1
Skilled Workers (SWORK)	Numbers	46.13317	114.3548	0	1760

Table 6.19 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 7.59 percent of firms are

involved in bribery. For publicly listed companies, 19.62 percent of firms are public listed companies. On average 9.35 percent of the firm are foreign-owned. On average firms are 23.4 years older and 51.09 percent of firms are larger firms. The average experience of the managers in the sample is 22.39 years. For external audits, 50.08 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 46.13.

6.10.2 Results and Discussion: Disaggregated Analysis of OECD

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.20. The variable of firms' performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.20: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of OECD

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-1.345973*	.1554973	-8.66	0.000
Public Listed Company (PLCOMP)	.0672006	.0727667	0.92	0.356
Foreign Firms (FORFIRM)	.0003214	.0011398	0.28	0.778
Firm Age (FAGE)	.0154672*	.0014351	10.78	0.000
Firm Size (FSIZE)	1.72261*	.0724816	23.77	0.000
Manager Experience (MANEXP)	.0142887*	.0023855	5.99	0.000
External Audit (EXAUDIT)	.2076535*	.0669674	3.10	0.002
Skilled Workers (SWORK)	.003694*	.0003518	10.50	0.000

Constant	5.758905*	.088524	65.05	0.000
Observation	3433			
Overall Significance (F-value)	194.76			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.10.2.1 Corruption and Firms’ Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms’ performance (See Section 4.2.1). Corruption has a negative and significant coefficient, which confirm the negative relationship between corruption and annual real sale growth. Our results confirm the sand the wheel hypothesis in case of the disaggregated analysis of OECD countries.

6.10.2.2 Firm Age and Firms’ Performance

Theoretically, firm age positively affects firms’ performance. It is hypothesized that aged firms improve firms’ performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.10.2.3 Firm Size and Firms’ Performance

Theoretically, the size of the firm may affect firms’ performance significantly. It is proposed that medium and larger firms positively affect firms’ performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.10.2.4 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.10.2.5 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.10.2.6 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.11 The Effects of Corruption on Firms' Performance in South Asia

6.11.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 6.21.

Table 6.21: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of South Asia

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption	Binary Variable	.1793872	.383694	0	1

(CORRP)					
Public Listed Company (PLCOMP)	Binary Variable	.5296681	.5104991	0	1
Foreign Firms (FORFIRM)	Percentage	.9318763	8.321854	0	100
Firm Age (FAGE)	Years	19.75105	14.39691	0	162
Firm Size (FSIZE)	Binary Variable	.6094244	.4879028	0	1
Manager Experience (MANEXP)	Years	14.56887	9.811464	0	71
External Audit (EXAUDIT)	Binary Variable	.7147851	.4515335	0	1
Skilled Workers (SWORK)	Numbers	74.95524	299.8194	0	13000

Table 6.21 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 17.93 percent of firms are involved in bribery. For publicly listed companies, 52.96 percent of firms are public listed companies. On average, 93.18 percent of the firm are foreign-owned. On average firms are 19.75 years older and 60.94 percent of firms are larger firms. The average experience of the managers in the sample is 14.56 years. For external audits, 71.47 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 74.95.

6.11.2 Results and Discussion: Disaggregated Analysis of South Asia

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.22. The variable of firms' performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.22: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of South Asia

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.0561665*	.0167507	3.35	0.001
Public Listed Company (PLCOMP)	.5187181*	.0151609	34.21	0.000
Foreign Firms (FORFIRM)	.0029804*	.0009015	3.31	0.001
Firm Age (FAGE)	.0030339*	.0005379	5.64	0.000
Firm Size (FSIZE)	.0205588	.0131821	1.56	0.119
Manager Experience (MANEXP)	-.0019265*	.0007194	-2.68	0.007
External Audit (EXAUDIT)	.408713*	.0146672	27.87	0.000
Skilled Workers (SWORK)	.0009216*	.0000714	12.91	0.000
Constant	7.396586*	.0219655	336.74	0.000
Observation	13725			
Overall Significance (F-value)	476.10			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.11.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). Corruption has a positive and significant coefficient, which confirm the positive relationship between corruption and annual real sale growth. Our results confirm the grease the wheel hypothesis in case of the disaggregated analysis of South Asian countries. Our results are in line with the findings of the Jiang and Nie (2014).

6.11.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.11.2.3 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.11.2.4 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.11.2.5 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results

confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.11.2.6 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.11.2.7 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that a skilled worker has improves firms' performance.

6.12 The Effects of Corruption on Firms' Performance in Sub-Saharan Africa

6.12.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion. Descriptive results of the disaggregated analysis are given in Table 6.23.

Table 6.23: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Performance: Disaggregated Analysis of Sub-Saharan Africa

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2162866	.4117388	0	1
Public Listed Company (PLCOMP)	Binary Variable	.5468117	.4978285	0	1
Foreign Firms (FORFIRM)	Percentage	12.92357	30.90066	0	100

Firm Age (FAGE)	Years	16.08691	14.4654	0	166
Firm Size (FSIZE)	Binary Variable	.5893393	.4919999	0	1
Manager Experience (MANEXP)	Years	15.74541	10.34309	1	144
External Audit (EXAUDIT)	Binary Variable	.5188512	.4996692	0	1
Skilled Workers (SWORK)	Numbers	29.43225	103.4765	0	3000

Table 6.23 provides summary statistics of the variables analyzed for the effect of corruption on firms' performance in the disaggregated analysis. It explains that 21.62 percent of firms are involved in bribery. For publicly listed companies, 54.68 percent of firms are public listed companies. On average, 12.92 percent of the firm are foreign-owned. On average firms are 16.08 years older and 58.93 percent of firms are larger firms. The average experience of the managers in the sample is 15.74 years. For external audits, 51.88 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. In the sample of 147 countries average skilled workers of the firms are 29.43.

6.12.2 Results and Discussion: Disaggregated Analysis of Sub-Saharan Africa

To see the effect of corruption on firms' performance, the ordinary least square has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.3 are shown in Table 6.4. The variable of firms' performance has been measured through annual real sale growth. The majority of the results are according to the theory and supported by the existing literature.

Table 6.24: Regression Results of the Effects of Corruption on Firms' Performance: Disaggregated Analysis of Sub-Saharan Africa

Variables	Coefficient	Standard Error	T Statistics	Probability
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				Value
Corruption (CORRP)	.0929652*	.0331368	2.81	0.005
Public Listed Company (PLCOMP)	.3360807*	.0298228	11.27	0.000
Foreign Firms (FORFIRM)	.0040619*	.0004912	8.27	0.000
Firm Age (FAGE)	.0069258*	.0011446	6.05	0.000
Firm Size (FSIZE)	.2683463*	.0282673	9.49	0.000
Manager Experience (MANEXP)	.0184705*	.001479	12.49	0.000
External Audit (EXAUDIT)	.4011555*	.0292196	13.73	0.000
Skilled Workers (SWORK)	.0019678*	.0001696	11.60	0.000
Constant	6.564417*	.0401883	163.34	0.000
Observation	10354			
Overall Significance (F-value)	207.23			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

6.12.2.1 Corruption and Firms' Performance

Theoretically, corruption as a variable is significantly associated with firm performance. It is hypothesized that corruption has an inverse impact on firms' performance (See Section 4.2.1). Corruption has a positive and significant coefficient, which confirm the positive relationship between corruption and annual real sale growth. Our results confirm the grease the wheel hypothesis in case of the disaggregated analysis of Sub-Saharan Africa countries.

6.12.2.2 Public Listed Company and Firms' Performance

Theoretically, the public listed company has a significant impact of firms' performance. It is speculated that the public listed company has a positive effect on firms' performance (See Section 4.4.14). The result of the variable public listed company is positive and statistically

significant. Our results indicate that the annual sale of public listed company is higher as compared to another form of business. The market plays a vital role in the expansion of the business. Public listed company performs more as compared to a sole owner firms (Clarke & Xu, 2004).

6.12.2.3 Foreign Firms and Firms' Performance

Theoretically, foreign ownership may affect firms' performance positively. It is speculated that the greater the share of foreign ownership, the more the efficiency of the firm (See Section 4.4.7). The coefficient of foreign firms is positive and statistically significant, which indicates that foreign firms are more productive and increases the sale of the firm. Greater mobility of capital increases firms' performance.

6.12.2.4 Firm Age and Firms' Performance

Theoretically, firm age positively affects firms' performance. It is hypothesized that aged firms improve firms' performance (See Section 4.4.10). The results of firm age are positive which indicates that older firms perform well as compared to younger firms. Older firms are well established and operated systematically. So they properly utilized their available resources optimally, which increase real sales.

6.12.2.5 Firm Size and Firms' Performance

Theoretically, the size of the firm may affect firms' performance significantly. It is proposed that medium and larger firms positively affect firms' performance (See Section 4.4.11). The result of firm size is positive, which indicates that medium and larger firms increase firms' sales more than as compared to smaller firms.

6.12.2.6 Manager Experience and Firms' Performance

Theoretically, the manager experience positively affects firms' performance. It is hypothesized in section 4.4.12 that higher manager experience improves firms' performance. The results confirm the positive effect on firms' performance. The manager with more experience, can optimally and technically transform firms resource into a final output which increases firms' sale and improve firms' performance (Collins et al., 2009).

6.12.2.7 External Audit and Firms' Performance

Theoretically, the external audit has a positive effect on firms' performance. It is supposed in section 4.4.13 firms that strictly inspect their accounts perform well. The results confirm the positive effect of external audit on firms' performance. The study of Safavian et al. (2001) also provides the same results.

6.12.2.8 Skilled Workers and Firms' Performance

Theoretically, skilled workers as a variable may affect firms' performance positively. It is hypothesized that skilled workers have a positive impact on firms' performance (See Section 4.4.16). The result shows that skilled worker has improves firms' performance.

Chapter 7

Results and Discussion: The Effects of Corruption on Firm level Innovation

This chapter provides results and discussion of the effect of corruption on firm level innovation. In this chapter, we have provided the answer to our third research question. This chapter meets our third objective, to estimate the impact of corruption and on firm level innovation in a panel of global economies, global income groups, and global regional groups.

7.1 The Effects of Corruption on Firm level Innovation in Aggregate Analysis

7.1.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the aggregate analysis are given in Table 7.1.

Table 7.1: Descriptive Statistics of the Variables of Effects of Corruption on Firm Level Innovation: Aggregate Analysis

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1778109	.3823576	0	1
Domestic Firms (DOMFIRM)	Percentage	90.13283	27.52034	0	100
Registered Firms (REGFIRM)	Binary Variable	.9037048	.2990865	0	1
Firm Age (FAGE)	Years	19.1769	15.54594	0	340
Firm Size (FSIZE)	Binary Variable	.5950355	.490891	0	1
Manager Experience (MANEXP)	Years	17.7321	11.0299	0	144
External Audit (EXAUDIT)	Binary Variable	.5715643	.4948561	0	1
Skilled Workers (SWORK)	Numbers	68.45974	306.9713	0	19000
Exporting Firm (EXPORT)	Percentage	7.459691	21.84569	0	100

Table 7.1 provides summary statistics of the variables analyzed for the effect of corruption on innovation in aggregate analysis. It explains that 17.8 percent of firms are involved in bribery. For ownership of the firm, 90.13 percent are domestic firms. In the sample, registered firms are 90.37 percent. On average firms are 19.17 years older and the sample contains 59.50 percent of firms are larger. The average experience of the managers in the sample is 17.73 years. For external audits, 57.1 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 68.45. The average exports of the firms are 7.45.

7.1.2 Result and Discussion: Aggregate Analysis

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (aggregate analysis). The results of the Equation No 4.5 are shown in Table 7.2. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.2: Regression Results of The Effects of Corruption on Firm level Innovation: Aggregate Analysis

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-6.564417*	.0401883	-163.34	0.000
Domestic Firms (DOMFIRM)	-.003243*	.0003017	-10.75	0.000
Registered Firms (REGFIRM)	.0693601*	.027578	2.52	0.012
Firm Age (FAGE)	.0052455*	.0005964	8.80	0.000
Firm Size (FSIZE)	.1297929*	.0253186	5.13	0.012

Manager Experience (MANEXP)	.0053438*	.0008696	6.15	0.000
External Audit (EXAUDIT)	.3843084*	.0169348	22.69	0.000
Skilled Workers (SWORK)	.0001295	.0000772	1.68	0.290
Exporting Firm (EXPORT)	-.000283	.0003899	-0.01	0.994
Constant	-.3738983	.0425526	-8.79	0.000
Observation	62,460			
Overall Significance (F-value)	73.45			0.000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.1.2.1 Corruption and Firms' Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Results indicate that corruption has a negative and significant coefficient, which indicates that the corrupt firms are less innovative. The justification for this result is that corrupt firms are less efficient, and these firms get license by paying bribes to public officials. These firms cannot focus on innovative activities. In the sample of 147 countries the majority of the firms are from either low income or lower middle income groups. These firms are less innovative. It is corroborated from Table 1.3 that all the low income and lower middle income nations are least innovative. This is in line with the findings of (Sdiri and Ayadi, 2016).

7.1.2.2 Domestic Firms and Firms' Innovation

Theoretically, domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is negative which shows that the domestic firms are less innovative as

compared to a foreign firm. In the sample of 147 countries the majority of the firms are from low income and lower middle income nations. These firms involved in corrupt practices and less efficient, hence less innovative as shown in Table 1.3.

7.1.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.1.2.4 Firm Age and Firms' Innovation

Theoretically, firm age may affect firms' innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.1.2.5 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.1.2.6 Manager Experience and Firms' Innovation

Theoretically, the manager experience positively affects firms' innovation. It is hypothesized in section 4.4.12 that higher manager experience improves firms' innovation. The coefficient of manager experience is positive and statistically significant, which shows that firms with greater manager experience are more likely to innovate as compared to newly appointed managers. The experienced manager utilizes firms' resources optimally and try to capture greater share of the market by introducing new product and services over time.

7.1.2.7 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.2 The Effects of Corruption on Firm level Innovation in High Income Countries

7.2.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.3.

Table 7.3: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of Higher Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1044349	.3058482	0	1
Domestic Firms	Percentage	90.57566	27.40429	0	100

(DOMFIRM)					
Registered Firms (REGFIRM)	Binary Variable	.9444654	.2290351	0	1
Firm Age (FAGE)	Years	22.79703	19.66078	0	210
Firm Size (FSIZE)	Binary Variable	.5337385	.4989127	0	1
Manager Experience (MANEXP)	Years	21.17592	11.88807	1	70
External Audit (EXAUDIT)	Binary Variable	.5249144	.4994105	0	1
Skilled Workers (SWORK)	Numbers	51.65708	189.821	0	6754
Exporting Firm (EXPORT)	Percentage	7.806993	21.16505	0	100

Table 7.3 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 10.44 percent of firms are involved in bribery. For ownership of the firm, 90.57 percent are domestic firms. In the sample, registered firms are 94.44 percent. On average firms are 22.79 years older and the sample contains 53.37 percent of firms are larger. The average experience of the managers in the sample is 21.17 years. For external audits, 52.49 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 51.65. The average exports of the firms are 7.806.

7.2.2 Result and Discussion: Disaggregated Analysis of High Income Countries

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.4. The variable of innovation has been measured by transforming the WBES question

into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.4: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of High Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-.1448124	.0843229	-1.72	0.090
Domestic Firms (DOMFIRM)	.0025582	.0009543	2.68	0.007
Registered Firms (REGFIRM)	.9185298	.1283599	7.16	0.000
Firm Age (FAGE)	.0045975	.0014708	3.13	0.002
Firm Size (FSIZE)	.3507678	.0976183	3.59	0.074
Manager Experience (MANEXP)	-.0033606	.0021725	-1.55	0.123
External Audit (EXAUDIT)	.4093416	.0500495	8.18	0.000
Skilled Workers (SWORK)	.0009738	.0004799	2.03	0.248
Exporting Firm (EXPORT)	.0034905	.0011557	3.02	0.003
Constant	1.235297	.1730002	7.14	0.000
Observation	8,032			
Overall Significance (F-value)	17.87			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.2.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Results indicate that corruption has a negative and significant coefficient, which indicates that the corrupt firms are less innovative. The firms in the high income countries are efficient and less

inclined in bribery. Corruption does not work as grease money so the firms in the high income nations considers corruption as hurdle in the innovation generation process.

7.2.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is positive which shows that the domestic firms are more innovative in high income countries.

7.2.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.2.2.4 Firm Age and Firms' Innovation

Theoretically, firm age may affect firms' innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.2.2.5 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient

of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.2.2.6 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.2.2.7 Exporting Firms and Innovation

Theoretically, exporting firm, as a variable, may affect firms' innovation positively. It is hypothesized that exporting firms have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of exporting firm is positive and significant which shows that firms that exports are innovative. In order to exports, a greater percentage of their product firms have to compete in the international market. For this purpose, firms have to be innovative in the production of high-quality goods. So exported firms increase innovation activities.

7.3 The Effects of Corruption on Firm level Innovation in Low Income Countries

7.3.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion. Descriptive results of the disaggregated analysis are given in Table 7.5.

Table 7.5: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of Low Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2613075	.4393889	0	1
Domestic Firms (DOMFIRM)	Percentage	84.12881	33.60942	0	100
Registered Firms (REGFIRM)	Binary Variable	.8605447	.3760539	0	1
Firm Age (FAGE)	Years	14.96789	13.96702	0	125
Firm Size (FSIZE)	Binary Variable	.4922457	.5000174	0	1
Manager Experience (MANEXP)	Years	14.32124	9.818599	1	66
External Audit (EXAUDIT)	Binary Variable	.4619917	.4985891	0	1
Skilled Workers (SWORK)	Numbers	37.98175	177.1464	0	6100
Exporting Firm (EXPORT)	Percentage	3.631987	15.17701	0	100

Table 7.5 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 26.13 percent of firms are involved in bribery. For ownership of the firm, 84.12 percent are domestic firms. In the sample, registered firms are 86.05 percent. On average firms are 14.96 years older and the sample contains 49.22 percent of firms are larger. The average experience of the managers in the sample is 14.32 years. For external audits, 46.19 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 37.98. The average exports of the firms are 3.631.

7.3.2 Result and Discussion: Disaggregated Analysis of Low Income Countries

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown

in Table 7.6. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.6: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of Low Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.2159121*	.0309312	6.98	0.000
Domestic Firms (DOMFIRM)	-.0035866*	.0007422	-4.83	0.000
Registered Firms (REGFIRM)	.4071569*	.0673885	6.04	0.000
Firm Age (FAGE)	-.0004222	.0019758	-0.21	0.831
Firm Size (FSIZE)	-.0743575	.0925015	-0.80	0.509
Manager Experience (MANEXP)	.001207	.0028125	0.43	0.668
External Audit (EXAUDIT)	.2382513*	.05479	4.35	0.000
Skilled Workers (SWORK)	.000249	.0006504	0.38	0.762
Exporting Firm (EXPORT)	.0000649	.0020047	0.03	0.975
Constant	-.3668203*	.1002326	-3.66	0.000
Observation	7,109			
Overall Significance (F-value)	3.65			0.0173

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.3.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Results indicates that corruption has a positive and significant coefficient, which indicate that in low

income nation corrupt firms are more innovative (Smith, Thomas, and Antoniou, 2014). The firms in low income nation are inefficient and these firms considers corruption as grease money and take benefits from public officials by offering them bribe for obtaining permits to start new production process. So, corruption has positive affect on firm innovation.

7.3.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is negative which shows that the domestic firms are less innovative as compared to a foreign firm. These firms involved in corrupt practices and less efficient, hence less innovative as shown in Table 1.3.

7.3.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.3.2.4 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.4 The Effects of Corruption on Firm level Innovation in Lower Middle Income Countries

7.4.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.7.

Table 7.7: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of Lower Middle Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.2080248	.4059038	0	1
Domestic Firms (DOMFIRM)	Percentage	91.11852	26.42127	0	100
Registered Firms (REGFIRM)	Binary Variable	.8956019	.3057815	0	1
Firm Age (FAGE)	Years	19.17333	14.56994	0	211
Firm Size (FSIZE)	Binary Variable	.6036127	.4891579	0	1
Manager Experience (MANEXP)	Years	16.47949	10.56065	1	144
External Audit (EXAUDIT)	Binary Variable	.6251605	.4840899	0	1
Skilled Workers (SWORK)	Numbers	72.96929	308.9429	0	14000
Exporting Firm (EXPORT)	Percentage	7.299973	22.53002	0	100

Table 7.7 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 20.80 percent of firms are involved in bribery. For ownership of the firm, 91.11 percent are domestic firms. In the sample, registered firms are 89.56 percent. On average firms are 19.17 years older and the sample contains 60.36 percent of firms are larger. The average experience of the managers in the sample is 16.47 years. For external audits, 62.51 percent of firms in the sample report that their income statements and

balance sheets are reconciled by external auditors. On average skilled workers of the firms are 72.96. The average exports of the firms are 7.299.

7.4.2 Result and Discussion: Disaggregated Analysis of Lower Middle Income Countries

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.8. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.8: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of Lower Middle Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.0710843*	.0299835	2.37	0.018
Domestic Firms (DOMFIRM)	-.0034041*	.0004575	-7.44	0.000
Registered Firms (REGFIRM)	.0919494*	.0415768	2.21	0.027
Firm Age (FAGE)	.0048973*	.0009097	5.38	0.000
Firm Size (FSIZE)	.0812673*	.0289692	2.81	0.013
Manager Experience (MANEXP)	-.0014745	.0012777	-1.15	0.249
External Audit (EXAUDIT)	.4649805*	.026548	17.51	0.000
Skilled Workers (SWORK)	.0001628*	.0000431	3.78	0.000
Exporting Firm (EXPORT)	.0029871*	.0005432	5.50	0.000
Constant	-.7689714*	.0675674	-11.38	0.000

Observation	29,414	
Overall Significance (F-value)	63.20	0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.4.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms’ innovation (See Section 4.3.2). Results indicates that corruption has a positive and significant coefficient, which indicate that in lower middle income nation corrupt firm are more innovative (Smith, Thomas, and Antoniou, 2014).

7.4.2.2 Domestic Firms and Firms’ Innovation

Theoretically, the domestic firms may affect firms’ innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is negative which shows that the domestic firms are less innovative as compared to a foreign firm.

7.4.2.3 Registered Firms and Firms’ Innovation

Theoretically, registered firms may affect firms’ innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.4.2.4 Firm Age and Firms’ Innovation

Theoretically, firm age may affect firms’ innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to

infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.4.2.5 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.4.2.6 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.4.2.7 Skilled Workers and Firms' Innovation

Theoretically, skilled workers, as a variable, may affect firms' innovation positively. It is hypothesized that skilled workers have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of skilled workers is positive and significant which shows that firms that employ more skilled workers are more innovative. The skilled workers are productive and they produce a quality product that competes in the national and international market, having the least cost and high quality, firms with skilled workers are more innovative.

7.2.2.8 Exporting Firms and Innovation

Theoretically, exporting firm, as a variable, may affect firms' innovation positively. It is hypothesized that exporting firms have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of exporting firm is positive and significant which shows that firms that exports are innovative. In order to exports, a greater percentage of their product firms have to compete in the international market. For this purpose, firms have to be innovative in the production of high-quality goods. So exported firms increase innovation activities.

7.5 The Effects of Corruption on Firm level Innovation in Upper Middle Income Countries

7.5.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.9.

Table 7.9: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of Upper Middle Income Countries

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1282188	.334346	0	1
Domestic Firms (DOMFIRM)	Percentage	90.66056	26.38842	0	100
Registered Firms (REGFIRM)	Binary Variable	.9158156	.277672	0	1
Firm Age (FAGE)	Years	19.21551	15.17522	0	340
Firm Size (FSIZE)	Binary Variable	.6297707	.4828852	0	1
Manager Experience (MANEXP)	Years	19.62492	11.10014	1	100
External Audit (EXAUDIT)	Binary Variable	.5477341	.4977306	0	1
Skilled Workers (SWORK)	Numbers	74.28877	360.7692	0	19000

Exporting Firm (EXPORT)	Percentage	9.038397	22.96539	0	100
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Table 7.9 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 12.82 percent of firms are involved in bribery. For ownership of the firm, 90.66 percent are domestic firms. In the sample, registered firms are 91.58 percent. On average firms are 19.21 years older and the sample contains 62.97 percent of firms are larger. The average experience of the managers in the sample is 19.62 years. For external audits, 54.77 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 74.28. The average exports of the firms are 9.038.

7.5.2 Result and Discussion: Disaggregated Analysis of Upper Middle Income Countries

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.10. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.10: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of Upper Middle Income Countries

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-.1104139*	.046972	-2.35	0.019
Domestic Firms (DOMFIRM)	.0032952*	.0006713	4.91	0.000
Registered Firms (REGFIRM)	.304384*	.0578715	5.26	0.000

Firm Age (FAGE)	.0069311*	.0012212	5.68	0.000
Firm Size (FSIZE)	.2515897*	.0353243	7.12	0.000
Manager Experience (MANEXP)	-.0010892	.0015833	-0.69	0.492
External Audit (EXAUDIT)	.6339727*	.0320214	19.80	0.000
Skilled Workers (SWORK)	-.0000961	.0000893	-1.08	0.405
Exporting Firm (EXPORT)	.0055543*	.0007052	7.88	0.000
Constant	.3725468*	.0928076	4.01	0.000
Observation	17,905			
Overall Significance (F-value)	56.91			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.5.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Results indicate that corruption has a negative and significant coefficient, which indicates that the corrupt firms are less innovative. This is in line with the findings of (Sdiri and Ayadi, 2016).

7.5.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is positive which shows that the domestic firms are more innovative in upper middle income nations.

7.5.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.5.2.4 Firm Age and Firms' Innovation

Theoretically, firm age may affect firms' innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.5.2.5 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.5.2.7 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external

audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.5.2.8 Exporting Firms and Innovation

Theoretically, exporting firm, as a variable, may affect firms' innovation positively. It is hypothesized that exporting firms have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of exporting firm is positive and significant which shows that firms that exports are innovative. In order to exports, a greater percentage of their product firms have to compete in the international market. For this purpose, firms have to be innovative in the production of high-quality goods. So exported firms increase innovation activities.

6.6 The Effects of Corruption on Firm level Innovation in East Asia & Pacific

6.6.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.11.

Table 7.11: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of East Asia & Pacific

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.3185163	.4659359	0	1
Domestic Firms (DOMFIRM)	Percentage	88.07524	28.98617	0	100
Registered Firms (REGFIRM)	Binary Variable	.8716527	.3344936	0	1
Firm Age (FAGE)	Years	16.73411	11.33944	0	161
Firm Size (FSIZE)	Binary Variable	.5816665	.4933137	0	1
Manager Experience (MANEXP)	Years	16.79616	9.422493	1	70
External Audit	Binary Variable	.5267299	.4993119	0	1

(EXAUDIT)					
Skilled Workers (SWORK)	Numbers	111.2007	507.8935	0	19000
Exporting Firm (EXPORT)	Percentage	9.509216	24.58357	0	100

Table 7.11 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 31.85 percent of firms are involved in bribery. For ownership of the firm, 88.07 percent are domestic firms. In the sample, registered firms are 87.16 percent. On average firms are 16.73 years older and the sample contains 58.16 percent of firms are larger. The average experience of the managers in the sample is 16.79 years. For external audits, 52.67 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 111.200. The average exports of the firms are 9.509.

7.6.2 Result and Discussion: Disaggregated Analysis of East Asia & Pacific

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.12. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.12: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of East Asia & Pacific

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-.2147942*	.0486614	-4.41	0.000
Domestic Firms (DOMFIRM)	.0035243*	.0007933	4.44	0.000

Registered Firms (REGFIRM)	.5215965*	.0717463	7.27	0.000
Firm Age (FAGE)	-.0316603*	.0023901	-13.25	0.000
Firm Size (FSIZE)	.1660129*	.0471023	3.52	0.001
Manager Experience (MANEXP)	.0163637*	.0026617	6.15	0.000
External Audit (EXAUDIT)	1.07686*	.0452515	23.80	0.000
Skilled Workers (SWORK)	.000042	.0000436	0.96	0.336
Exporting Firm (EXPORT)	.0010231	.0009204	1.11	0.266
Constant	-1.3407*	.1143594	-11.72	0.000
Observation	9,643			
Overall Significance (F-value)	94.79			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.6.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Results indicate that corruption has a negative and significant coefficient, which indicates that the corrupt firms are less innovative. This is in line with the findings of (Sdiri and Ayadi, 2016).

7.6.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is positive which shows that the domestic firms are more innovative as compared to a foreign firm.

7.6.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.6.2.4 Firm Age and Firms' Innovation

Theoretically, firm age may affect firms' innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.6.2.5 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.6.2.6 Manager Experience and Firms' Innovation

Theoretically, the manager experience positively affects firms' innovation. It is hypothesized in section 4.4.12 that higher manager experience improves firms' innovation. The coefficient of manager experience is positive and statistically significant, which shows that firms with greater manager experience are more likely to innovate as compared to newly appointed managers. The

experienced manager utilizes firms' resources optimally and try to capture greater share of the market by introducing new product and services over time.

7.6.2.7 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.7 The Effects of Corruption on Firm level Innovation in Eastern Europe & Central Asia

7.7.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.13.

Table 7.13: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of Eastern Europe & Central Asia

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1367046	.3435591	0	1
Domestic Firms (DOMFIRM)	Percentage	92.72094	23.20315	0	100
Registered Firms (REGFIRM)	Binary Variable	.9724188	.1637781	0	1
Firm Age (FAGE)	Years	15.67353	13.14897	0	166
Firm Size (FSIZE)	Binary Variable	.4609989	.4985465	0	1
Manager Experience (MANEXP)	Years	17.12222	10.32399	1	100
External Audit	Binary Variable	.3867655	.487035	0	1

(EXAUDIT)					
Skilled Workers (SWORK)	Numbers	63.43031	214.5642	0	6754
Exporting Firm (EXPORT)	Percentage	7.416137	21.14733	0	100

Table 7.13 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 13.67 percent of firms are involved in bribery. For ownership of the firm, 92.72 percent are domestic firms. In the sample, registered firms are 97.24 percent. On average firms are 15.67 years older and the sample contains 46.09 percent of firms are larger. The average experience of the managers in the sample is 17.12 years. For external audits, 38.67 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 63.43. The average exports of the firms are 7.41.

7.7.2 Result and Discussion: Disaggregated Analysis of Eastern Europe & Central Asia

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.14. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.14: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of Eastern Europe & Central Asia

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.708292*	.1166623	6.07	0.027

Domestic Firms (DOMFIRM)	.0029906*	.0009477	3.16	0.002
Registered Firms (REGFIRM)	.3677764*	.1301947	2.82	0.005
Firm Age (FAGE)	.0123793*	.0018125	6.83	0.000
Firm Size (FSIZE)	-.0580655	.0930092	-0.62	0.604
Manager Experience (MANEXP)	-.0017388	.0023458	-0.74	0.459
External Audit (EXAUDIT)	.3811568*	.0473047	8.06	0.000
Skilled Workers (SWORK)	.0003237*	.0001532	2.11	0.094
Exporting Firm (EXPORT)	.0007787	.0010614	0.73	0.463
Constant	-.5732402*	.1656518	-3.46	0.001
Observation	9,724			
Overall Significance (F-value)	20.49			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.7.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Corruption has a positive and significant coefficient, which indicate that in Eastern Europe & Central Asian nations corrupt firm are more innovative (Smith, Thomas, and Antoniou, 2014).

7.7.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is positive which shows that the domestic firms are more innovative.

7.7.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.7.2.4 Firm Age and Firms' Innovation

Theoretically, firm age may affect firms' innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.7.2.5 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.7.2.6 Skilled Workers and Firms' Innovation

Theoretically, skilled workers, as a variable, may affect firms' innovation positively. It is hypothesized that skilled workers have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of skilled workers is positive and significant which shows that firms that employ more skilled workers are more innovative. The skilled workers are productive and they

produce a quality product that competes in the national and international market, having the least cost and high quality, firms with skilled workers are more innovative.

7.8 The Effects of Corruption on Firm level Innovation in Latin America & Caribbean

7.8.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.15.

Table 7.15: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of Latin America & Caribbean

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.080834	.2725996	0	1
Domestic Firms (DOMFIRM)	Percentage	89.41576	28.99106	0	100
Registered Firms (REGFIRM)	Binary Variable	.8746132	.3311736	0	1
Firm Age (FAGE)	Years	24.56304	19.49062	0	340
Firm Size (FSIZE)	Binary Variable	.619161	.4856206	0	1
Manager Experience (MANEXP)	Years	22.13606	12.26532	1	70
External Audit (EXAUDIT)	Binary Variable	.6003998	.4898407	0	1
Skilled Workers (SWORK)	Numbers	43.15743	210.788	0	8762
Exporting Firm (EXPORT)	Percentage	6.085847	19.08216	0	100

Table 7.15 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 8.08 percent of firms are involved in bribery. For ownership of the firm, 89.41 percent are domestic firms. In the sample, registered

firms are 87.46 percent. On average firms are 24.56 years older and the sample contains 61.91 percent of firms are larger. The average experience of the managers in the sample is 22.13 years. For external audits, 60.03 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 43.15. The average exports of the firms are 6.08.

7.8.2 Result and Discussion: Disaggregated Analysis of Latin America & Caribbean

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.16. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.16: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of Latin America & Caribbean

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.4683948*	.0997812	4.69	0.000
Domestic Firms (DOMFIRM)	.0053651*	.0010594	5.06	0.000
Registered Firms (REGFIRM)	-.0122064	.0743321	-0.16	0.870
Firm Age (FAGE)	-.0001742	.0014583	-0.12	0.905
Firm Size (FSIZE)	.4056746*	.0540347	7.51	0.000
Manager Experience (MANEXP)	.0085847*	.0021175	4.05	0.000
External Audit (EXAUDIT)	.3716261*	.0535396	6.94	0.000
Skilled Workers (SWORK)	.0001859	.0001803	1.03	0.337

Exporting Firm (EXPORT)	-0.0010429	.001424	-0.73	0.464
Constant	1.559807*	.1359456	11.47	0.000
Observation	10,143			
Overall Significance (F-value)	23.84			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.8.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms’ innovation (See Section 4.3.2). Corruption has a positive and significant coefficient, which indicate that in Latin America & Caribbean Countries nations corrupt firm are more innovative (Smith, Thomas, and Antoniou, 2014).

7.8.2.2 Domestic Firms and Firms’ Innovation

Theoretically, the domestic firms may affect firms’ innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is positive which shows that the domestic firms are more innovative.

7.8.2.3 Firm Size and Firms’ Innovation

Theoretically, the size of the firm may affect firms’ innovation significantly. It is proposed that medium and larger firms positively affect firms’ innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.8.2.4 Manager Experience and Firms' Innovation

Theoretically, the manager experience positively affects firms' innovation. It is hypothesized in section 4.4.12 that higher manager experience improves firms' innovation. The coefficient of manager experience is positive and statistically significant, which shows that firms with greater manager experience are more likely to innovate as compared to newly appointed managers. The experienced manager utilizes firms' resources optimally and try to capture greater share of the market by introducing new product and services over time.

7.8.2.5 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.9 The Effects of Corruption on Firm Performance in Middle East & North Africa

7.9.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.17.

Table 7.17: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of the Middle East & North Africa

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.163276	.3696655	0	1
Domestic Firms	Percentage	92.80308	23.43098	0	100

(DOMFIRM)					
Registered Firms (REGFIRM)	Binary Variable	.9255014	.2626095	0	1
Firm Age (FAGE)	Years	22.26532	16.99041	0	211
Firm Size (FSIZE)	Binary Variable	.7577855	.4284908	0	1
Manager Experience (MANEXP)	Years	22.16495	11.71019	1	70
External Audit (EXAUDIT)	Binary Variable	.7274336	.4453289	0	1
Skilled Workers (SWORK)	Numbers	69.86991	249.8739	0	8000
Exporting Firm (EXPORT)	Percentage	12.13958	27.34378	0	100

Table 7.17 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 16.32 percent of firms are involved in bribery. For ownership of the firm, 92.80 percent are domestic firms. In the sample, registered firms are 92.55 percent. On average firms are 22.26 years older and the sample contains 75.77 percent of firms are larger. The average experience of the managers in the sample is 22.16 years. For external audits, 72.74 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 69.86. The average exports of the firms are 12.13.

7.9.2 Result and Discussion: Disaggregated Analysis of Middle East & North Africa

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.18. The variable of innovation has been measured through transforming the WBES

question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.18: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of the Middle East & North Africa

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.3321049*	.0710528	4.67	0.000
Domestic Firms (DOMFIRM)	-.0060984*	.0014254	-4.28	0.000
Registered Firms (REGFIRM)	-.1090293	.1322449	-0.82	0.410
Firm Age (FAGE)	.0021598	.0022302	0.97	0.333
Firm Size (FSIZE)	.7358773*	.1328464	5.54	0.006
Manager Experience (MANEXP)	.002506	.0032686	0.77	0.443
External Audit (EXAUDIT)	.0888312	.0817392	1.09	0.277
Skilled Workers (SWORK)	-.000047	.0003123	-0.15	0.898
Exporting Firm (EXPORT)	.0056786*	.0012468	4.55	0.000
Constant	-1.371593	.2182112	-6.29	0.000
Observation	4,567			
Overall Significance (F-value)	9.85			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.9.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Corruption has a positive and significant coefficient, which indicate that in Middle East & North Africa nations corrupt firm are more innovative (Smith, Thomas, and Antoniou, 2014).

7.9.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is negative which shows that the domestic firms are less innovative as compared to a foreign firm.

7.9.2.3 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint, so they spent more on innovation.

7.9.2.4 Exporting Firms and Innovation

Theoretically, exporting firm, as a variable, may affect firms' innovation positively. It is hypothesized that exporting firms have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of exporting firm is positive and significant which shows that firms that exports are innovative. In order to exports, a greater percentage of their product firms have to compete in the international market. For this purpose, firms have to be innovative in the production of high-quality goods. So exported firms increase innovation activities.

7.10 The Effects of Corruption on Firm level Innovation in OECD

7.10.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion. Descriptive results of the disaggregated analysis are given in Table 7.19.

Table 7.19: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of OECD

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.0759659	.264987	0	1
Domestic Firms (DOMFIRM)	Percentage	89.56133	29.01674	0	100
Registered Firms (REGFIRM)	Binary Variable	.9618656	.1915486	0	1
Firm Age (FAGE)	Years	23.40076	18.42526	0	210
Firm Size (FSIZE)	Binary Variable	.5109235	.5000048	0	1
Manager Experience (MANEXP)	Years	22.3964	11.58822	1	70
External Audit (EXAUDIT)	Binary Variable	.5008881	.5000732	0	1
Skilled Workers (SWORK)	Numbers	46.13317	114.3548	0	1760
Exporting Firm (EXPORT)	Percentage	9.874927	23.59751	0	100

Table 7.19 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 7.59 percent of firms are involved in bribery. For ownership of the firm, 89.56 percent are domestic firms. In the sample, registered firms are 96.18 percent. On average firms are 23.40 years older and the sample contains 51.09 percent of firms are larger. The average experience of the managers in the sample is 22.39 years. For external audits, 50.08 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 46.13 The average exports of the firms are 9.87.

7.10.2 Result and Discussion: Disaggregated Analysis of OECD

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown

in Table 7.20. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.20: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of OECD

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	-.7062502*	.1553857	-4.55	0.000
Domestic Firms (DOMFIRM)	-.0020124	.0015565	-1.29	0.217
Registered Firms (REGFIRM)	.4703196*	.2045329	2.30	0.022
Firm Age (FAGE)	.0186758*	.0026844	6.96	0.000
Firm Size (FSIZE)	.7689818*	.0791016	9.72	0.000
Manager Experience (MANEXP)	.0100746*	.0037667	2.67	0.016
External Audit (EXAUDIT)	-.1290725	.0990217	-1.30	0.237
Skilled Workers (SWORK)	.0015264	.0009973	1.53	0.314
Exporting Firm (EXPORT)	-.0005797	.0016505	-0.35	0.726
Constant	-.2508371	.2608579	-0.96	0.336
Observation	3,433			
Overall Significance (F-value)	19.09			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.10.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Results

indicate that corruption has a negative and significant coefficient, which indicates that the corrupt firms are less innovative. This is in line with the findings of (Sdiri and Ayadi, 2016).

7.10.2.2 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.10.2.3 Firm Age and Firms' Innovation

Theoretically, firm age may affect firms' innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.10.2.4 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.10.2.5 Manager Experience and Firms' Innovation

Theoretically, the manager experience positively affects firms' innovation. It is hypothesized in section 4.4.12 that higher manager experience improves firms' innovation. The coefficient of manager experience is positive and statistically significant, which shows that firms with greater manager experience are more likely to innovate as compared to newly appointed managers. The experienced manager utilizes firms' resources optimally and try to capture greater share of the market by introducing new product and services over time.

7.11 The Effects of Corruption on Firm level Innovation in South Asia

7.11.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.21.

Table 7.21: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of South Asia

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption (CORRP)	Binary Variable	.1793872	.383694	0	1
Domestic Firms (DOMFIRM)	Percentage	98.66579	9.700834	0	100
Registered Firms (REGFIRM)	Binary Variable	.9105182	.2854485	0	1
Firm Age (FAGE)	Years	19.75105	14.39691	0	162
Firm Size (FSIZE)	Binary Variable	.6094244	.4879028	0	1
Manager Experience (MANEXP)	Years	14.56887	9.811464	0	71
External Audit (EXAUDIT)	Binary Variable	.7147851	.4515335	0	1
Skilled Workers (SWORK)	Numbers	74.95524	299.8194	0	13000
Exporting Firm (EXPORT)	Percentage	7.251749	22.88567	0	100

Table 7.21 provides summary statistics of the variables analyzed for the effect of corruption on innovation in the disaggregated analysis. It explains that 17.93 percent of firms are involved in bribery. For ownership of the firm, 98.66 percent are domestic firms. In the sample, registered firms are 91.05 percent. On average firms are 19.75 years older and the sample contains 60.94 percent of firms are larger. The average experience of the managers in the sample is 14.56 years. For external audits, 71.47 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 74.95. The average exports of the firms are 7.25.

7.11.2 Result and Discussion: Disaggregated Analysis of South Asia

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.22. The variable of innovation has been measured through transforming the WBES question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.22: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of South Asia

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.1465171*	.053465	2.74	0.017
Domestic Firms (DOMFIRM)	-.010318*	.0018972	-5.44	0.000
Registered Firms (REGFIRM)	.3526322*	.0657219	5.37	0.000
Firm Age (FAGE)	.0023519*	.0013386	1.76	0.079

Firm Size (FSIZE)	.0683874*	.0385616	1.77	0.081
Manager Experience (MANEXP)	.002336	.0019664	1.19	0.235
External Audit (EXAUDIT)	.2848699*	.0407065	7.00	0.000
Skilled Workers (SWORK)	.0002571*	.0000773	3.32	0.003
Exporting Firm (EXPORT)	.0036168*	.0007876	4.59	0.000
Constant	.0456053	.2041273	0.22	0.823
Observation	13,725			
Overall Significance (F-value)	22.29			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.11.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Corruption has a positive and significant coefficient, which indicate that in South Asian nations corrupt firm are more innovative (Smith, Thomas, and Antoniou, 2014).

7.11.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is negative which shows that the domestic firms are less innovative as compared to a foreign firm.

7.11.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and

statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.11.2.4 Firm Age and Firms' Innovation

Theoretically, firm age may affect firms' innovation significantly. It is hypothesized that older firms are more innovative (See Section 4.4.10). The coefficient of firm age is positive and statistically significant, which shows that the older firm is more likely to innovate as compared to infant firms. These firms are more stable and efficiently utilized their available resources and producing surplus output. In order to capture the whole market these firms are eager to spent more on research and development. So older firms are more innovative.

7.11.2.5 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.11.2.6 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.11.2.7 Skilled Workers and Firms' Innovation

Theoretically, skilled workers, as a variable, may affect firms' innovation positively. It is hypothesized that skilled workers have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of skilled workers is positive and significant which shows that firms that employ more skilled workers are more innovative. The skilled workers are productive and they produce a quality product that competes in the national and international market, having the least cost and high quality, firms with skilled workers are more innovative.

7.11.2.8 Exports and Firms' Innovation

Theoretically, exports, as a variable, may affect firms' innovation positively. It is hypothesized that exports have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of exports is positive and significant which shows that firms that exports are innovative. In order to exports, a greater percentage of their product firms have to compete in the international market. For this purpose, firms have to be innovative in the production of high-quality goods. So exported firms increase innovation activities.

7.12 The Effects of Corruption on Firm level Innovation in Sub Saharan Africa

7.12.1 Descriptive Statistics

Descriptive statistics describe different features of the sample, i.e., averages and dispersion.

Descriptive results of the disaggregated analysis are given in Table 7.23.

Table 7.23: Descriptive Statistics of the Variables of Effects of Corruption on Firms' Innovation: Disaggregated Analysis of Sub Saharan Africa

Variables	Measurement Scale	Mean	Standard Deviation	Minimum	Maximum
Corruption	Binary Variable	.2162866	.4117388	0	1

(CORRP)					
Domestic Firms (DOMFIRM)	Percentage	78.54907	38.37995	0	100
Registered Firms (REGFIRM)	Binary Variable	.8582917	.3692569	0	1
Firm Age (FAGE)	Years	16.08691	14.4654	0	166
Firm Size (FSIZE)	Binary Variable	.5893393	.4919999	0	1
Manager Experience (MANEXP)	Years	15.74541	10.34309	1	144
External Audit (EXAUDIT)	Binary Variable	.5188512	.4996692	0	1
Skilled Workers (SWORK)	Numbers	29.43225	103.4765	0	3000
Exporting Firm (EXPORT)	Percentage	4.240978	16.15408	0	100

Table 7.23 provides summary statistics of the variables analyzed for the effect of corruption on innovation. in aggregate analysis. It explains that 21.62 percent of firms are involved in bribery. For ownership of the firm, 78.54 percent are domestic firms. In the sample, registered firms are 85.82 percent. On average firms are 16.08 years older and the sample contains 58.93 percent of firms are larger. The average experience of the managers in the sample is 15.74 years. For external audits, 51.88 percent of firms in the sample report that their income statements and balance sheets are reconciled by external auditors. On average skilled workers of the firms are 29.43. The average exports of the firms are 4.240.

7.12.2 Result and Discussion: Disaggregated Analysis of Sub Saharan Africa

To see the effect of corruption on innovation, the logistic regression model has been applied for a sample of 147 countries (disaggregated analysis). The results of the Equation No 4.5 are shown in Table 7.24. The variable of innovation has been measured through transforming the WBES

question into the dummy variable. The majority of the results are according to the theory and supported by the existing literature.

Table 7.24: Regression Results of The Effects of Corruption on Innovation: Disaggregated Analysis of Sub Saharan Africa

Variables	Coefficient	Standard Error	T Statistics	Probability Value
Corruption (CORRP)	.2108152*	.0162007	13.01	0.000
Domestic Firms (DOMFIRM)	-.0011969*	.0005297	-2.26	0.024
Registered Firms (REGFIRM)	.2348333*	.0557165	4.21	0.000
Firm Age (FAGE)	.0007305	.0015591	0.47	0.639
Firm Size (FSIZE)	.1931097*	.0477865	4.04	0.001
Manager Experience (MANEXP)	.0010014	.0021363	0.47	0.639
External Audit (EXAUDIT)	.2578647*	.0426618	6.04	0.000
Skilled Workers (SWORK)	.0008514*	.0003361	2.53	0.089
Exporting Firm (EXPORT)	.0026544*	.0013675	1.94	0.057
Constant	-.4875191*	.0900662	-5.41	0.000
Observation	10,354			
Overall Significance (F-value)	13.22			0.0000

* and ** Indicates significant at 5% and 10% level respectively. Robust standard errors are reported in the table. Robust standard error suggested by White (1980) is a remedial measures to obtain heteroscedasticity-corrected standard errors.

7.12.2.1 Corruption and Firm Innovation

Theoretically, corruption has a significant influence on innovation at the firm level. It is hypothesized that corruption inversely affects firms' innovation (See Section 4.3.2). Corruption has a positive and significant coefficient, which indicate that in Sub Saharan Africa nations corrupt firm are more innovative (Smith, Thomas, and Antoniou, 2014).

7.12.2.2 Domestic Firms and Firms' Innovation

Theoretically, the domestic firms may affect firms' innovation. It is hypothesized that domestic firms in low income and lower middle income are less innovative (See Section 4.4.8). The result of domestic firms is negative which shows that the domestic firms are less innovative as compared to a foreign firm.

7.12.2.3 Registered Firms and Firms' Innovation

Theoretically, registered firms may affect firms' innovation positively. It is supposed in section 4.4.7 registered firms are more innovative. The coefficient of the registered firm is positive and statistically significant, which shows that registered firms are more innovative. Registered firms have to fulfill quality standard hence these firms are more innovative.

7.12.2.4 Firm Size and Firms' Innovation

Theoretically, the size of the firm may affect firms' innovation significantly. It is proposed that medium and larger firms positively affect firms' innovation (See Section 4.4.11). The coefficient of firm size is positive and statistically significant, which shows that a larger firm is more likely to innovate as compared to smaller firms. The larger firms have no financial constraint so they spent more on innovation.

7.12.2.5 External Audit and Firms' Innovation

Theoretically, the external audit has a positive effect on firms' innovation. It is supposed in section 4.4.13 firms that strictly inspect their accounts are more innovative. The coefficient of external audit is positive and statistically significant, which shows that firms with an external audit are more likely to innovate. The firms that monitor their activities vigilantly are more efficient and more productive which make them more innovative.

7.12.2.6 Skilled Workers and Firms' Innovation

Theoretically, skilled workers, as a variable, may affect firms' innovation positively. It is hypothesized that skilled workers have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of skilled workers is positive and significant which shows that firms that employ more skilled workers are more innovative. The skilled workers are productive and they produce a quality product that competes in the national and international market, having the least cost and high quality, firms with skilled workers are more innovative.

7.12.2.7 Exporting Firms and Innovation

Theoretically, exporting firm, as a variable, may affect firms' innovation positively. It is hypothesized that exporting firms have a positive impact on firms' innovation (See Section 4.4.16). The coefficient of exporting firm is positive and significant which shows that firms that exports are innovative. In order to exports, a greater percentage of their product firms have to compete in the international market. For this purpose, firms have to be innovative in the production of high-quality goods. So exported firms increase innovation activities.

Chapter 8

Conclusion and Policy Recommendations

Corruption is no doubt one of the burning issues of the nation particularly of the developing nations. This study tried to address the main questions regarding corruption. Firstly, what are the firm level determinants of corruption. Secondly, what is the effect of corruption on firm performance and lastly, how it affects firm level innovation. In this study, we have performed the empirical analysis in aggregate as well as disaggregated groups of the economics. This chapter provides the conclusion and important policy recommendations.

8.1 Conclusion

This study provides the following findings.

8.1.1 Determinants of Firm level Corruption

The empirical analysis of this study provides eight determinants of corruption. They are bureaucratic problems faced by the firm, taxation, firms' registration, age and size of the firm, the experience of the manager, external audit by the firms, and crimes.

The bureaucratic problem faced by the firms in the form of spending time to deal with government regulation are found to be a very important determinant of corruption according to aggregate and disaggregated analysis. In the aggregate analysis of 147 global economies, bureaucratic problems have a strong positive effect on corruption. In the disaggregated analysis of income groups, bureaucratic problem increases corruption in the higher income, lower income, lower middle income, and upper middle income countries. In the disaggregated analysis of regional groups, it increases corruption in Asia & Pacific, Europe & Central Asia, Middle East

& North America, South Asia, Sub Saharan Africa. While the effect of bureaucratic problem on corruption is found to be insignificant in the case of Latin America & the Caribbean and OECD. The overall bureaucratic problems have positive effect on corruption in all income groups and regional groups.

The taxation for the business development of the firm as a variable is the second important determinant of corruption. In the aggregate analysis of global economies, taxation as a variable has shown a positive impact on corruption. In the income-wise disaggregated analysis, it increases corruption in the higher income, lower middle income, and upper middle income countries. In the case of the lower-income nations, it has an insignificant effect. In the region-wise disaggregated analysis, it increases corruption in Asia & the Pacific, OECD, and South Asia. While the effect of taxation on corruption is found to be insignificant in the case of Europe & Central Asia, Latin America & Caribbean, Middle East & North America and Sub Saharan Africa. The overall taxation have positive effect on corruption in all income groups and regional groups.

Exporting firm as a variable that is captured by the ratio of the total sales of a firm being exported directly is the third determinant of corruption. In the aggregate analysis of the global economies, exports have a negative impact on corruption. In the income-wise disaggregated analysis, it reduces corruption in the lower-income, lower middle income, and upper middle income countries, while results are insignificant for high income nations. In the region-wise disaggregated analysis, it reduces corruption in Asia & Pacific, Europe & Central Asia, Middle East & North America, South Asia, and Sub Saharan Africa. The effect of exports on corruption is found to be insignificant in the case of Latin America & Caribbean and OECD. The overall exporting firm have negative effect on corruption in all income groups and regional groups.

The firms' age is the fourth determinant of corruption. It has shown mixed results in aggregate and disaggregated analysis. In the aggregate analysis of the global economies, older firms are found less corrupted. In income-wise disaggregated analysis, the older firms in higher income and upper middle income are found less corrupted while such type of firms in lower-income and lower middle income countries are found more corrupted. In the region-wise disaggregated analysis, the older firms in Latin America & the Caribbean, OECD, and South Asia are found less corrupted. However, the older firms in Asia & Pacific and Sub Saharan Africa are involved in corruption. The effect of firm age on corruption is found to be insignificant in the case of Europe & Central Asia and for the Middle East & North America. The overall effect of firms' age on corruption is found negative in those regions where prevalence of corruption is low and effect of firms' age on corruption is found positive in those regions where prevalence of corruption is high.

The firms' size captured by the number of permanent workers is the fifth determinant of corruption at firm level. It has mixed results in aggregate and disaggregated analysis. In the aggregate analysis of the global economies effect of larger firms is insignificant. In income-wise disaggregated analysis, larger firms in higher income and lower middle income are less corrupted, while firms in upper middle income countries are more corrupted. The effect of low income countries is found to be insignificant. In the region-wise disaggregated analysis, larger firms in Europe & Central Asia, OECD, South Asia, and Sub Saharan Africa are found less corrupted. However, the firms in Latin America & the Caribbean and the Middle East & North America are found more corrupted. The effect of firm size on corruption is found to be insignificant in the case of Asia & the Pacific. The overall effect of firms' size on corruption is negative in the case of high income, lower middle income, Europe, OECD, South Asia and Sub-

Saharan Africa. The effect of firms' size on corruption in the case of upper middle income, Latin America & Caribbean and Middle East & North America is found positive.

The manager experience measured by the years of experience of the top manager in the sector is found the sixth determinant of corruption. In the aggregate analysis of the global economies, firms with managers' high level of experience are less likely to be corrupted. In income-wise disaggregated analysis, it has shown a negative effect on higher income, low income, and upper middle income countries, while it has a positive effect in lower middle income countries. In the region-wise disaggregated analysis, firms with managers' higher experience in Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North America, OECD and Sub Saharan Africa are less likely to be corrupted. However, the experience of managers in South Asian firms is more likely to increase the corruption at firm level.

The variable of external audit that is measured by whether the firm pass through the external audit annually or not is the seventh determinant of corruption. In the aggregate analysis of the global economies, external audit reduces corruption. In income-wise disaggregated analysis, it reduces corruption in the higher income, lower-income, and lower middle income countries. For upper middle income countries, its effect is insignificant. In region-wise disaggregated analysis, it reduces corruption in Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, and South Asian firms. While the effect of external audits on corruption is found to be insignificant in the case of the Middle East & North America, OECD and Sub Saharan Africa nations. The overall results in all income groups and regional groups indicates that external audit reduces likelihood of corruption at firm level.

The crimes as a variable captured in the current study as the crimes faced by the firms during the last fiscal year is the last determinant of corruption in our empirical analysis. In the aggregate

analysis of the global economies, crimes increase corruption. In income-wise disaggregated analysis, firms that reported crimes are more corrupted in higher income, lower income, lower middle income, and upper middle income countries. In the region-wise disaggregated analysis, crimes increase corruption in Asia & Pacific, Europe & Central Asia, Middle East & North America, South Asia, Sub Saharan Africa. While the effect of crimes on corruption is found to be insignificant in the case of Latin America & the Caribbean and for OECD. The overall results in all income groups and regional groups indicates that crimes increase the likelihood of corruption at firm level.

8.1.2 The Effect of Corruption on Firm Performance

To quantify the effect of corruption measured by the gift given to the public officials to get the things done on the firm performance, we have use corruption as a core variable while, publicly listed company, foreign firms firm age, size, manager experience, external audit, and skilled workers are the control variables.

The corruption being the core variable is found to have a significant impact on firm performance that is captured by the real sales growth of the firm. In the aggregate analysis of the global economies, corruption works as an efficient grease to improve firm performance. In income-wise disaggregated analysis, it increases firm performance (grease the wheel) in the low income and lower middle income nations while reduces firm performance (sand the wheel) in the high income nation. The results are insignificant for upper middle income countries. In the region-wise disaggregated analysis, it increases firm performance (grease the wheel) in Asia & Pacific, Europe & Central Asia, Middle East & North America, South Asian nations, while it reduces firm performance (sand the wheel) in Latin America & Caribbean, OECD and Sub Saharan Africa.

The publicly listed company as a variable was included in the analysis as control variable and it was captured as the firms with publicly listed companies of publicly listed company. In the aggregate analysis of the global economies, publicly listed firms improve firm performance. In income-wise disaggregated analysis, publicly listed firm increase performance (grease the wheel) in low income nation, lower middle and upper middle income nations. The results are insignificant for higher income countries. In the region-wise disaggregated analysis, it increases firm performance (grease the wheel) in Europe & Central Asia, Latin America & Caribbean, Middle East & North America, South Asia and in Sub Saharan Africa. The effect of publicly listed company on firm performance is found to be insignificant for Asia & the Pacific and OECD.

The foreign firm is a control variable measured by firms owned by foreigners. In the aggregate analysis of the global economies, foreign firms improve firm performance. In the income-wise disaggregated analysis, it increases firm performance (grease the wheel) in the high income, low income, the lower middle, and upper middle income nations. In the region wise disaggregated analysis, it increases firm performance (grease the wheel) in all regions. The effect of the foreign firms on firms' performance is found to be insignificant for the Middle East & North America and for OECD.

The firm age measured through subtracting the year of establishment the firm began operation from survey year is a control variable. In an aggregate analysis of the global economies, older firms improve firm performance. In income-wise disaggregated analysis, older firms increase firm performance (grease the wheel) in the high income, low income, lower middle, and upper middle income nations. In region-wise disaggregated analysis, it also increases firm performance (grease the wheel) in all regions.

The firms' size captured by the number of permanent workers is a control variable. In an aggregate analysis of the global economies, larger firms improve firm performance. In income-wise disaggregated analysis, larger firms increase firm performance (grease the wheel) in the high income, low income, lower middle, and upper middle income nations. In region-wise disaggregated analysis, it also increases firm performance (grease the wheel) in all regions. The results are insignificant for South Asian firms.

The manager experience measured by the years of experience of the top manager in the sector is a control variable. In the aggregate analysis of the global economies, manager experience improves firm performance. In income-wise disaggregated analysis, the high experience of the manager increases firm performance (grease the wheel) in the high income, low income, lower middle income, and upper middle income nations. In region-wise disaggregated analysis, it also increases firm performance (grease the wheel) in all regions.

The variable of external audit that is measured by whether the firm pass through the external audit annually or not is a control variable. In the aggregate analysis of the global economies, external audit improves firm performance. In the income-wise disaggregated analysis, external audit increases firm performance (grease the wheel) in the high income, low income, lower middle, and upper middle income nations. In the region-wise disaggregated analysis, it also increases firm performance (grease the wheel) in all regions.

The skilled worker is a control variable captured through proportion of skilled workers out of all production workers. In the aggregate analysis of the global economies, skilled workers improve firm performance. In the income-wise disaggregated analysis, skilled workers increase firm performance (grease the wheel) in the high income, low income, lower middle, and upper middle

income nations. In the region-wise disaggregated analysis, it also increases firm performance (grease the wheel) in all regions.

8.1.3 The Effect of Corruption on Innovation

To quantify the effect of corruption measured by the gift given to the public officials to get the things done on firm level innovation, we have use corruption as a core variable while, domestic firm, registered firms, firm age, size, manager experience, external audit skilled workers and exports are the control variables.

The corruption being the core variable is found to have a significant impact on firm innovation that is captured by the introduction of innovative product and services. In the aggregate analysis of the global economies, corruption has a negative and significant impact on firm level innovation. In income-wise disaggregated analysis, it increases innovation of the firm in low income, lower middle income nations, while reduces innovation in high income and upper middle income nations. In region-wise disaggregated analysis, it increases innovation of the firm in, Europe & Central Asia, Latin America & Caribbean, Middle East & North America, Sub Saharan Africa and South Asian nations. While reduces firm innovation in Asia & Pacific and for OECD.

The domestic firm is a control variable captured as firms owned by domestic owner. In the aggregate analysis of the global economies, domestic firms reduce firm innovation. In the income-wise disaggregated analysis, it increases innovation of the firm in the high income and upper middle income countries. While it reduces innovation of the firm in low income, lower middle. In the region-wise disaggregated analysis, it increases firm innovation in Asia & the Pacific, Europe & Central Asia, and Latin America & Caribbean. While it reduces firm

innovation in Middle East & North America, South Asia and Sub Saharan Africa. While the impact of corruption on innovation in OECD countries is found insignificant.

The registered firms measured as formally registered when it began operations is a control variable. In the aggregate analysis of the global economies, registered firms increase firm innovation. In the income-wise disaggregated analysis, it increases innovation of the firm in the high-income, low income, upper middle income countries and lower middle income countries. In region-wise disaggregated analysis, it increases firm innovation in all regions. While the impact of corruption on innovation for Latin America & the Caribbean and the Middle East & North America is found insignificant.

Firm age is a control variable. In the aggregate analysis of the global economies, older firms increase firm innovation. In income-wise disaggregated analysis, it increases innovation of the firm in the high-income, lowers middle and for upper middle income countries. While it has an insignificant impact in low income nations. In the region-wise disaggregated analysis, it increases firm innovation in Europe & Central Asia, OECD and South Asian countries, while it has a negative impact on innovation in Asia & Pacific. While the impact for Latin America & the Caribbean, Middle East & North America and for Sub Saharan Africa is insignificant.

Firm size is a control variable. In the aggregate analysis of the global economies, larger firms increase firm innovation. In income-wise disaggregated analysis, it increases innovation of the firm in the high-income, lowers middle and for upper middle income countries. While it has an insignificant impact in low income nations. In the region-wise disaggregated analysis, it increases firm innovation in, Asia & Pacific, Latin America & Caribbean, Middle East & North America, OECD, South Asia and Sub Saharan Africa. While the impact for Europe & Central Asia is insignificant.

Manager experience is a control variable. In the aggregate analysis of the global economies, a more experienced manager increases firm innovation. In income-wise disaggregated analysis, it

has insignificant results in the high, low, lower middle and upper middle income countries. In the region-wise disaggregated analysis, it increases firm innovation in, Asia & Pacific, Latin America & Caribbean and in OECD. While the impact for Europe & Central Asia, Middle East & North America, South Asia and for Sub Saharan Africa is insignificant.

The external audit is a control variable. In the aggregate analysis of the global economies, external audit improves firm innovation. In income-wise disaggregated analysis, external audit increases firm innovation in the high income, low income, lower middle, and upper middle income nations. In the region-wise disaggregated analysis, it also increases firm innovation in all regions.

A skilled worker is a control variable. In the aggregate analysis of the global economies, skilled workers improve firm innovation, but it has an insignificant result. In the income-wise disaggregated analysis, skilled workers increase firm innovation in the lower middle nations, while the impact in high income, low income and upper middle income nations is insignificant. In the region-wise disaggregated analysis, it also increases firm innovation in Europe & Central Asia, South Asia and Sub Saharan Africa, while it has an insignificant impact for Asia & Pacific, Latin America & Caribbean, Middle East & North America and for OECD.

Exporting firm is a control variable. In the aggregate analysis of the global economies, the impact of exports on innovation is insignificant. In income-wise disaggregated analysis, export increases firm innovation in the high income, lower middle and upper middle income nations but insignificant for low income nations. In region-wise disaggregated analysis, it also increases firm innovation in the Middle East & North America, South Asia and for Sub Saharan Africa, but insignificant for Asia & Pacific, Europe & Central Asia, Latin America & Caribbean and OECD.

8.2 Policy Recommendations

The following are the policy recommendations based on the results of the current study.

8.2.1 Elimination of Firm level Corruption

Our results have shown that bureaucratic problem, taxation, and crimes are responsible for firm level chances of corruption in the aggregate analysis of the global economies as well as in income and region-wise disaggregated analysis. While registered firms and external audits reduce the probability of corruption. We proposed the following policy recommendations:

- It is clear from the results that bureaucratic hurdle is the key factor for corruption. To reduce the probability of corruption there is a greater need for good governance. Bureaucratic problem could be reduced through simplifying the procedure for obtaining license and permit and by allowing the firm to start its operation through least documentation and the least interaction with public officials. The malfunctioning of public officials could be reduced by increasing the quality of the institution.
- In the analysis of 147 economies this study found strong evidence that all the firms in aggregate and disaggregated analysis considers taxation as constraint and to avoid taxations firms offer bribes. The government takes step to minimize tax avoidance. It is also proposed that tax system must be transparent. So, firms do not consider taxation as hurdle in the growth of their business.
- The results indicate that crimes also increase the probability of corruption, the government should take appropriate measures for the elimination of crimes. The crimes can be cleared through proper accountability and with proper audit of accounts.

- The exporting firms are found less corrupted, so government should provide subsidy for export promotion. The government provide incentive to exporting firms in the form of rebate in taxes. The government should also simplify the procedure for obtaining export permit to encourage the exporters.
- The external audit of the firm reduces the chance of corruption for the firms, so the government and firm both should appoint qualified and experienced external auditors.

8.2.2 The Effect of Corruption on Firm Performance

There is consensus of researchers and policymakers in the literature that corruption has both greasing and sanding effects on firm performance. The current study provides similar results that corruption improves firm performance in aggregate analysis of global economies. The disaggregated results of income groups indicate that corruption works as grease the wheels for low income economies, lower middle income economies. In the case of high income nations corruption act as sand the wheel. The disaggregated results of regional groups provide that corruption improves firms' performance for Asia & Pacific, Europe & Central Asia, Middle East & North America, South Asia and Sub-Saharan-Africa. The results for Latin America & Caribbean and OECD indicate that corruption reduces firm performance. Based on the results following policy proposals are framed.

- Majority of the results support the greasing hypothesis in low income economies, lower middle income economies, Asia & Pacific, Europe & Central Asia, Middle East & North America and South Asian countries. The benefits that firms obtained (with regard to customs, taxes, licenses, regulation, services) through paying bribes to public official are either temporary or increase firm sale only in the short run, therefore we do not encourage corrupt practices and suggest that the government should take measures to

reduce procedural problem in getting various services. The measures taken in this regard should be both demand side and supply side. Firm willingness to pay bribes to a public official to get things done is due to the result of only supply-side anti-corruption policies. Demand-side anti-corruption measures should be taken as per law to reduce firm willingness to offer bribes. The individual communities and the government, all should play their role to reduce corruption.

- As publicly listed firms are more efficient, the government should provide easy business and investment climate for public listed companies, in this way not only the performance of the firms will improve but also in macro perspective growth of the nation will improve.
- The result indicates that firms with an external audit are less corrupted and also improve a firm's annual real sale, the government should play its role as an efficient supervisor and external auditor.
- The firm should hire managers with greater experience to improve its performance.
- As the effect of foreign firms on sale is positive, the government should encourage foreign direct investment in the country. This step also improves the performance of the firms as well as the nation as a whole.

8.2.3 The Effect of Corruption on Innovation

Our Results shows that corruption has a negative effect on innovation in high income, upper middle income, Asia & Pacific and in OECD nation, while it has a positive effect on innovation in lower middle income, Europe & Central Asia, Latin America & Caribbean and in South Asian countries. Based on our results we provide the following policy implications.

- As it is quite clear from our results that corruption reduces innovation in the high income nation while improving innovation in the lower-income nations. Here we proposed the same implication as we proposed in case of firm performance. As the overall impact of corruption is harmful both for the firm as well as for the nation, it is bureaucratic problems and institutional weakness in the low income nations that showed short term positive relationships. So, we suggest that the government should reduce procedural hurdles and improve the performance of an institution to combat corruption.
- As registered firms are more innovative, the government should simplify the registration procedure to increase registered firms.
- Skilled worker increases the probability of firm innovation, we proposed that government and firm should spend more on human capital to increase the skill and productivity of the worker and to make them more innovative, which will increase the performance of the firm as well as of the nation.
- Exporting firms are found more innovative, the government should give subsidy to the exporters and reduce procedural hurdles in obtaining license for export. the government should also give income tax relief on the income earned through exporting goods and services.

REFERENCES

- Ades, A., & Di Tella, R. (1999). Rents, competition, and corruption. *American Economic Review*, 89(4), 982–993.
- Aidt, T. S. (2003). Economic analysis of corruption: a survey. *The Economic Journal*, 113(491), 632–652.
- Aidt, T. S. (2009). Corruption, institutions, and economic development. *Oxford Review of Economic Policy*, 25(2), 271–291.
- Ali, A. M., & Isse, H. S. (2002). Determinants of economic corruption: a cross-country comparison. *Cato Journal*, 22(3), 449–466.
- Anokhin, S., & Schulze, W. S. (2009a). Entrepreneurship, innovation, and corruption. *Journal of Business Venturing*, 24(5), 465–476.
- Anokhin, S., & Schulze, W. S. (2009b). Entrepreneurship, innovation, and corruption. *Journal of Business Venturing*, 24(5), 465–476.
- Argandoña, A. (2005). Corruption and companies: The use of facilitating payments. *Journal of Business Ethics*, 60(3), 251–264.
- Asiedu, E., & Freeman, J. (2009). The effect of corruption on investment growth: Evidence from firms in Latin America, Sub-Saharan Africa, and transition countries. *Review of Development Economics*, 13(2), 200–214.
- Atangana Ondo, H. (2013). Gouvernance et croissance économique en Afrique. *African Development Review*, 25(2), 130–147.
- Athanasouli, D., & Goujard, A. (2015). Corruption and management practices: Firm level evidence. *Journal of Comparative Economics*, 43(4), 1014–1034.
- Ayaydin, H., & Hayaloglu, P. (2014). The effect of corruption on firm growth: evidence from firms in Turkey. *Asian Economic and Financial Review*, 4(5), 607–624.
- Bai, J., Jayachandran, S., Malesky, E. J., & Olken, B. A. (2017). Firm growth and corruption: Empirical evidence from vietnam. *The Economic Journal*, 129(618), 651–677.
- Baldwin, J. R., & Gu, W. (2004). Trade liberalization: Export-market participation, productivity growth, and innovation. *Oxford Review of Economic Policy*, 20(3), 372–392.
- Bardhan, P. (1997). Corruption and development: a review of issues. *Journal of Economic Literature*, 35(3), 1320–1346.
- Barth, J. R., Lin, C., Lin, P., & Song, F. M. (2009). Corruption in bank lending to firms: Cross-country micro evidence on the beneficial role of competition and information sharing. *Journal of Financial Economics*, 91(3), 361–388.
- Baumol, W. (1990). Entrepreneurship: Productive, unproductive and destructiver. *The Journal of Political Economy*, 11(1), 3–22.

- Bbaale, E., & Okumu, I. M. (2018). Corruption and firm-level productivity: greasing or sanding effect? *World Journal of Entrepreneurship, Management and Sustainable Development*, 14(3), 222–241.
- Becchetti, L., & Rossi, S. P. S. (2000). The positive effect of industrial district on the export performance of Italian firms. *Review of Industrial Organization*, 16(1), 53–68.
- Beck, P. J., & Maher, M. W. (1986). A comparison of bribery and bidding in thin markets. *Economics Letters*, 20(1), 1–5.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and Legal Constraints to Growth: Does Firm Size Matter? *The Journal of Finance*, 60(1), 137–177.
- Becker, G. S., & Stigler, G. J. (1974). Law enforcement, malfeasance, and compensation of enforcers. *The Journal of Legal Studies*, 3(1), 1–18.
- Beltrán, A. (2016). Does corruption increase or decrease employment in firms? *Applied Economics Letters*, 23(5), 361–364.
- Bertarelli, S., & Lodi, C. (2015). Innovation and exporting: a study on Eastern European firms. *Sustainability*, 10(1), 1–21.
- Blagojević, S., & Damijan, J. P. (2013). The impact of corruption and ownership on the performance of firms in Central and Eastern Europe. *Post-Communist Economies*, 25(2), 133–158.
- Boermans, M. A. (2013). Do exports, FDI, and outsourcing in transition countries drive firm-level innovation? *Atlantic Economic Journal*, 41(2), 197–198.
- Braun, M., & Di Tella, R. (2004). Inflation, inflation variability, and corruption. *Economics & Politics*, 16(1), 77–100.
- Brown, N. C., Smith, J. D., White, R. M., & Zutter, C. J. (2015). Greased wheels or just greased palms: political corruption and firm value. *Journal of Business Ethics*, 37(2), 110–137
- Buchanan, J. M. (1980). Rent seeking and profit seeking. *Toward a Theory of the Rent-Seeking Society*, 3, 15.
- Burki, S. J., & Perry, G. E. (1998). *Beyond the Washington consensus: institutions matter*. The World Bank Latin American and Caribbean studies ; viewpoints. Washington DC; World Bank.
- Butler, A. W., Fauver, L., & Mortal, S. (2009). Corruption, political connections, and municipal finance. *The Review of Financial Studies*, 22(7), 2873–2905.
- Čábelková, I., & Hanousek, J. (2004). The power of negative thinking: corruption, perception and willingness to bribe in Ukraine. *Applied Economics*, 36(4), 383–397.
- Cariolle, J. (2018). *Corruption determinants in developing and transition economies: Insights from a multi-level analysis*, FERDI Working paper P229.
- Cassiman, B., Golovko, E., & Martínez-Ros, E. (2010). Innovation, exports and productivity. *International Journal of Industrial Organization*, 28(4), 372–376.

- Chang, E. C. C., & Golden, M. A. (2007). Electoral systems, district magnitude and corruption. *British Journal of Political Science*, 37(1), 115–137.
- Clarke, G. R. G., & Xu, L. C. (2004). Privatization, competition, and corruption: how characteristics of bribe takers and payers affect bribes to utilities. *Journal of Public Economics*, 88(9–10), 2067–2097.
- Collier, M. W. (2002). Explaining corruption: An institutional choice approach. *Crime, Law and Social Change*, 38(1), 1–32.
- Collins, J. D., Uhlenbruck, K., & Rodriguez, P. (2009). Why Firms Engage in Corruption: A Top Management Perspective. *Journal of Business Ethics*, 87(1), 89–108.
- Colonnelli, E., & Prem, M. (2017). *Corruption and firms: Evidence from randomized audits in brazil*, SIEPR working paper 18011
- Cooray, A., Dzhumashev, R., & Schneider, F. (2017). How Does Corruption Affect Public Debt? An Empirical Analysis. *World Development*, 90, 115–127.
- Cuervo-Cazurra, A. (2006). Who cares about corruption? *Journal of International Business Studies*, 37(6), 807–822.
- Damania, R., Fredriksson, P. G., & Mani, M. (2004). The persistence of corruption and regulatory compliance failures: theory and evidence. *Public Choice*, 121(3–4), 363–390.
- Damijan, J. P., Kostevc, Č., & Polanec, S. (2010). From innovation to exporting or vice versa? *World Economy*, 33(3), 374–398.
- De Rosa, D., Gooroochurn, N., & Görg, H. (2015). Corruption and productivity: Firm-level evidence. *Jahrbücher Für Nationalökonomie Und Statistik*, 235(2), 115–138.
- de Waldemar, F. S. (2012). New products and corruption: evidence from Indian firms. *The Developing Economies*, 50(3), 268–284.
- Demenet, A., Ho, H.-A., & Morcillo, S. (2017.). *Firm-level corruption*. Helsinki, Finland: UNU-WIDER.
- Di Tella, R., & Schargrotsky, E. (2003). The role of wages and auditing during a crackdown on corruption in the city of Buenos Aires. *The Journal of Law and Economics*, 46(1), 269–292.
- Diamond, L. (1987). Class formation in the swollen African state. *The Journal of Modern African Studies*, 25(4), 567–596.
- Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The regulation of entry. *The Quarterly Journal of Economics*, 117(1), 1–37.
- Doh, J. P., Rodriguez, P., Uhlenbruck, K., Collins, J., & Eden, L. (2003). Coping with corruption in foreign markets. *Academy of Management Perspectives*, 17(3), 114–127.
- Donadelli, M., & Persha, L. (2014). Understanding emerging market equity risk premia: Industries, governance and macroeconomic policy uncertainty. *Research in International Business and Finance*, 30, 284–309.
- Dong, B., & Torgler, B. (2013). Causes of corruption: Evidence from China. *China Economic*

Review, 26, 152–169.

- Dreher, A., & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice*, 155(3), 413–432.
- Egger, P., & Winner, H. (2005). Evidence on corruption as an incentive for foreign direct investment. *European Journal of Political Economy*, 21(4), 932–952.
- Ellis, J. A., Smith, J. D., & White, R. M. (2015). Corruption and corporate innovation. *Journal of Financial and Quantitative*, (In Press).
- Farooq, A., Shahbaz, M., Arouri, M., & Teulon, F. (2013). Does corruption impede economic growth in Pakistan? *Economic Modelling*, 35, 622–633.
- Farooq, O., & Shehata, N. F. (2018). Does external auditing combat corruption? Evidence from private firms. *Managerial Auditing Journal*, 33(3), 267–287.
- Faruq, H., Webb, M., & Yi, D. (2013). Corruption, Bureaucracy and Firm Productivity in Africa. *Review of Development Economics*, 17(1), 117–129.
- Fisman, R., & Gatti, R. (2002). Decentralization and corruption: evidence across countries. *Journal of Public Economics*, 83(3), 325–345.
- Fisman, R., & Miguel, E. (2007). Corruption, norms, and legal enforcement: Evidence from diplomatic parking tickets. *Journal of Political Economy*, 115(6), 1020–1048.
- Fisman, R., & Svensson, J. (2007). Are corruption and taxation really harmful to growth? Firm level evidence. *Journal of Development Economics*, 83(1), 63–75.
- Frechette, G. R. (2006). *Panel data analysis of the time-varying determinants of corruption*. CIRANO Working Papers 2006s-28.
- 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.
- Frye, T., & Shleifer, A. (1997). The Invisible Hand and the Grabbing Hand. *American Economic Review*, 87 (2), 354–358.
- Galang, R. M. N. (2012). Victim or victimizer: Firm responses to government corruption. *Journal of Management Studies*, 49(2), 429–462.
- Gao, Y. (2010). Mimetic isomorphism, market competition, perceived benefit and bribery of firms in transitional China. *Australian Journal of Management*, 35(2), 203–222.
- Gashi, P. (2014). Human capital and export decisions: The case of small and medium enterprises in Kosovo. *Croatian Economic Survey*, 16(2), 91–120.
- Gaviria, A. (2002). Assessing the effects of corruption and crime on firm performance: evidence from Latin America. *Emerging Markets Review*, 3(3), 245–268.
- Goedhuys, M., Mohnen, P., & Taha, T. (2016). Corruption, innovation and firm growth: firm-level evidence from Egypt and Tunisia. *Eurasian Business Review*, 6(3), 299–322.

- Goldberg, M., Kim, K. W., & Ariano, M. (2014). *How firms cope with crime and violence: Experiences from around the world*. The World Bank.
- Golla, J. (2010). *How strong is the influence of Corruption on Innovation, especially in post-communist EU Member States?-A Comparative Analysis*. University of Twente.
- Graeff, P., & Mehlkop, G. (2003). The impact of economic freedom on corruption: different patterns for rich and poor countries. *European Journal of Political Economy*, 19(3), 605–620.
- Gray, C., Hellman, J., & Ryterman, R. (2004). *Anticorruption in Transition 2: Corruption in Enterprise-State Interactions in Europe and Central Asia 1999-2002*. The World Bank.
- Gujarati, D. N. (2009). *Basic econometrics*. Tata McGraw-Hill Education, New Delhi.
- Gurgur, T., & Shah, A. (2005). *Localization and corruption: Panacea or pandora's box?* World Bank Policy Research Working Paper No. 3486.
- Gyimah-Brempong, K. (2002). Corruption, economic growth, and income inequality in Africa. *Economics of Governance*, 3(3), 183–209.
- Habib, M., & Zurawicki, L. (2002). Corruption and foreign direct investment. *Journal of International Business Studies*, 33(2), 291–307.
- Habiyaremye, A., & Raymond, W. (2018). How do foreign firms' corruption practices affect innovation performance in host countries? Industry-level evidence from transition economies. *Innovation*, 20(1), 18–41.
- Hamra, W. (2000). Bribery in international business transactions and the OECD convention: Benefits and limitations. *Business Economics*, 35(4), 33.
- Hanousek, J., & Kochanova, A. (2016). Bribery environments and firm performance: Evidence from CEE countries. *European Journal of Political Economy*, 43, 14–28.
- Harsch, E. (1993). Accumulators and democrats: Challenging state corruption in Africa. *The Journal of Modern African Studies*, 31(1), 31–48.
- Hellman, J. S., Jones, G., & Kaufmann, D. (2003). Seize the state, seize the day: state capture and influence in transition economies. *Journal of Comparative Economics*, 31(4), 751–773.
- Heredia, J., Flores, A., Geldes, C., & Heredia, W. (2017). Effects of informal competition on innovation performance: the case of pacific alliance. *Journal of Technology Management & Innovation; Vol 12, No 4 (2017)*
- Herrera, A. M., & Rodriguez, P. (2003). Bribery and the nature of corruption. *Michigan. State University, Department of Economics*.
- Herzfeld, T., & Weiss, C. (2003). Corruption and legal (in) effectiveness: an empirical investigation. *European Journal of Political Economy*, 19(3), 621–632.
- Hirsch, S., & Bijaoui, I. (1985). R&D intensity and export performance: a micro view. *Weltwirtschaftliches Archiv*, 121(2), 238–251.
- Huang, C.J. (2016). Is corruption bad for economic growth? Evidence from Asia-Pacific

- countries. *The North American Journal of Economics and Finance*, 35, 247–256.
- Huang, F., & Rice, J. (2012). Firm networking and bribery in China: Assessing some potential negative consequences of firm openness. *Journal of Business Ethics*, 107(4), 533–545.
- Jaffe, A. B. (1986). *Technological opportunity and spillovers of R&D: evidence from firms' patents, profits and market value*. national bureau of economic research Cambridge, Mass., USA.
- Jain, A. K. (2001). Corruption: A Review. *Journal of Economic Surveys*, 15(1), 71–121.
- James, H. S. (2002). When is a bribe a bribe? Teaching a workable definition of bribery. *Teaching Business Ethics*, 6(2), 199–217.
- Jiang, T., & Nie, H. (2014). The stained China miracle: Corruption, regulation, and firm performance. *Economics Letters*, 123(3), 366–369.
- Johnson, S., Kaufmann, D., McMillan, J., & Woodruff, C. (2000). Why do firms hide? Bribes and unofficial activity after communism. *Journal of Public Economics*, 76(3), 495–520.
- Kaufmann, D. (1997). Corruption: the facts. *Foreign Policy-Washington*, 114–131.
- Kaufmann, D. (2005). Myths and realities of governance and corruption. Global Competitiveness Report 2005-06, 81-98.
- Kaufmann, D., Montoriol-Garriga, J., & Recanatini, F. (2008). *How does bribery affect public service delivery? Micro-evidence from service users and public officials in Peru*. The World Bank.
- Keefer, P., & Knack, S. (1997). Why don't poor countries catch up? A cross-national test of an institutional explanation. *Economic Inquiry*, 35(3), 590–602.
- Knack, S., & Azfar, O. (2003). Trade intensity, country size and corruption. *Economics of Governance*, 4(1), 1–18.
- Kogan, L., Papanikolaou, D., Seru, A., & Stoffman, N. (2017). Technological Innovation, Resource Allocation, and Growth*. *The Quarterly Journal of Economics*, 132(2), 665–712.
- Krastanova, P. (2014). Greasing the wheels of innovation: How corruption and informal practices of firms impact the level of innovation in Bulgaria. *Central European University*.
- Kumar, N., & Siddharthan, N. S. (1994). Technology, firm size and export behaviour in developing countries: the case of Indian enterprises. *The Journal of Development Studies*, 31(2), 289–309.
- Kuncoro, A. (2004). Bribery in Indonesia: some evidence from micro-level data. *Bulletin of Indonesian Economic Studies*, 40(3), 329–354.
- Kunicova, J., & Rose-Ackerman, S. (2005). Electoral rules and constitutional structures as constraints on corruption. *British Journal of Political Science*, 35(4), 573–606.
- Kwok, C. C. Y., & Tadesse, S. (2006). The MNC as an agent of change for host-country institutions: FDI and corruption. *Journal of International Business Studies*, 37(6), 767–785.

- Lambsdorff, J. G. (2002). How confidence facilitates illegal transactions: An empirical approach. *American Journal of Economics and Sociology*, 829–853.
- Lamotte, O., & Colovic, A. (2013). Innovation and internationalization of young entrepreneurial firms. *Management International/International Management/Gestión Internacional*, 18(1), 87–103.
- Lancaster, T. D., & Montinola, G. R. (1997). Toward a methodology for the comparative study of political corruption. *Crime, Law and Social Change*, 27(3–4), 185–206.
- Lau, L. J., & Park, J. (2003). The sources of East Asian economic growth revisited. *Conference on International and Development Economics in Honor Henry Y. Wan, Jr., Cornell University, Ithaca*.
- Lee, S. H., & Oh, K. E. (2010). Why do firms bribe? Insights from residual control theory into firms' exposure and vulnerability to. *Management International Review*, 50(6), 775–796.
- Lefebvre, E., Lefebvre, L. A., & Bourgault, M. (1998). R&D-related capabilities as determinants of export performance. *Small Business Economics*, 10(4), 365–377.
- Leff, N. H. (1964). Economic development through bureaucratic corruption. *American Behavioral Scientist*, 8(3), 8–14.
- Leonidou, L. C., Katsikeas, C. S., Palihawadana, D., & Spyropoulou, S. (2007). An analytical review of the factors stimulating smaller firms to export: Implications for policy-makers. *International Marketing Review*, 24(6), 735–770.
- Lewandowska, M. S., Szymura-Tyc, M., & Gołębiowski, T. (2016). Innovation complementarity, cooperation partners, and new product export: Evidence from Poland. *Journal of Business Research*, 69(9), 3673–3681.
- Li, H., Xu, L. C., & Zou, H. (2000). Corruption, income distribution, and growth. *Economics & Politics*, 12(2), 155–182.
- Liu, C., & Mikesell, J. L. (2014). The impact of public officials' corruption on the size and allocation of US state spending. *Public Administration Review*, 74(3), 346–359.
- Lo Turco, A., & Maggioni, D. (2015). Imports, exports and the firm product scope: evidence from Turkey. *The World Economy*, 38(6), 984–1005.
- Love, J. H., & Roper, S. (2015). SME innovation, exporting and growth: A review of existing evidence. *International Small Business Journal*, 33(1), 28–48.
- Lui, F. T. (1985). An equilibrium queuing model of bribery. *Journal of Political Economy*, 93(4), 760–781.
- Luo, Y., & Han, B. (2009). Graft and business in emerging economies: An ecological perspective. *Journal of World Business*, 44(3), 225–237.
- Manion, M. (2004). Lessons for mainland China from anti-corruption reform in Hong Kong. *China Review*, 81–97.
- Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, 110(3), 681–

- Mbate, M. (2018). Who bears the burden of bribery? Evidence from public service delivery in Kenya. *Development Policy Review*, 36, 321–340.
- Mendoza, R. U., Lim, R. A., & Lopez, A. O. (2015). Grease or Sand in the Wheels of Commerce? Firm Level Evidence on Corruption and SMES. *Journal of International Development*, 27(4), 415–439.
- Méon, P.-G., & Sekkat, K. (2005). Does corruption grease or sand the wheels of growth? *Public Choice*, 122(1), 69–97.
- Méon, P.-G., & Weill, L. (2010). Is Corruption an Efficient Grease? *World Development*, 38(3), 244–259.
- Michaels, J. W., & Miethe, T. (1989). Applying theories of deviance to academic cheating. *Social Science Quarterly*, 70(4), 870.
- Monreal-Pérez, J., Aragón-Sánchez, A., & Sánchez-Marín, G. (2012). A longitudinal study of the relationship between export activity and innovation in the Spanish firm: The moderating role of productivity. *International Business Review*, 21(5), 862–877.
- Myrdal, G. (1968). Corruption: Its causes and effects. *Asian Drama: An Inquiry into the Poverty of Nations*, 2, 953–961.
- Ngo, T.-W. (2008). Rent-seeking and economic governance in the structural nexus of corruption in China. *Crime, Law and Social Change*, 49(1), 27–44.
- Nguyen, N. A., Doan, Q. H., Nguyen, N. M., & Tran-Nam, B. (2016). The impact of petty corruption on firm innovation in Vietnam. *Crime, Law and Social Change*, 65(4–5), 377–394.
- O’Toole, C. M., & Tarp, F. (2014). Corruption and the efficiency of capital investment in developing countries. *Journal of International Development*, 26(5), 567–597.
- Özçelik, E., & Taymaz, E. (2004). Does innovativeness matter for international competitiveness in developing countries?: The case of Turkish manufacturing industries. *Research Policy*, 33(3), 409–424.
- Palda, K. F. (2001). *Tax evasion and firm survival in competitive markets*. Edward Elgar Publishing, number 2662.
- Pelizzo, R., Araral, E., Pak, A., & Xun, W. (2016). Determinants of Bribery: Theory and Evidence from Sub-Saharan Africa. *African Development Review*, 28(2), 229–240.
- Persson, T., Tabellini, G., & Trebbi, F. (2003). Electoral rules and corruption. *Journal of the European Economic Association*, 1(4), 958–989.
- Philp, M. (1997). Defining political corruption. *Political Studies*, 45(3), 436–462.
- Qi Zhou, J., & W. Peng, M. (2011). Does bribery help or hurt firm growth around the world? In *Asia Pacific Journal of Management*, 29(4), 907–921.
- Rand, J., & Tarp, F. (2012). Firm-Level Corruption in Vietnam. *Economic Development and*

Cultural Change, 60(3), 571–595.

- 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-Ackerman, S. (2004). *The Challenge of Poor Governance and Corruption, Copenhagen Consensus*. Environmental Assessment Institute, USA.
- Safavian, M. S., Graham, D. H., & Gonzalez-Vega, C. (2001). Corruption and microenterprises in Russia. *World Development*, 29(7), 1215–1224.
- Sahakyan, N., & Stiegert, K. W. (2012). Corruption and Firm Performance. *Eastern European Economics*, 50(6), 5–27.
- Salinas-Jiménez, M. del M., & Salinas-Jiménez, J. (2007). Corruption, efficiency and productivity in OECD countries. *Journal of Policy Modeling*, 29(6), 903–915.
- Salomon, R. M., & Shaver, J. M. (2005). Learning by exporting: new insights from examining firm innovation. *Journal of Economics & Management Strategy*, 14(2), 431–460.
- Santos, D. F. L., Basso, L. F. C., Kimura, H., & Kayo, E. K. (2014). Innovation efforts and performances of Brazilian firms. *Journal of Business Research*, 67(4), 527–535.
- Sanyal, R. (2005). Determinants of Bribery in International Business: The Cultural and Economic Factors. *Journal of Business Ethics*, 59(1), 139–145.
- Schumpeter, J. A. (1939). *Business cycles* (Vol. 1). McGraw-Hill New York.
- Sdiri, H., & Ayadi, M. (2016). Does innovation foster or mitigate the corruption obstacle? Firm-level evidence from Tunisia, *Journal of Economic Growth*, 11(1), 110–130.
- Seldadyo, H., & de Haan, J. (2006). The Determinants of Corruption: A Literature Survey and New Evidence, Working paper. *University of Groningen*.
- Sequeira, S., & Djankov, S. (2014). Corruption and firm behavior: Evidence from African ports. *Journal of International Economics*, 94(2), 277–294.
- Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1–2), 225–256.
- Sharma, C., & Mitra, A. (2015). Corruption, governance and firm performance: Evidence from Indian enterprises. *Journal of Policy Modeling*, 37(5), 835–851.
- Shleifer, A., & Vishny, R. W. (1993). Corruption. *The Quarterly Journal of Economics*, 108(3), 599–617.
- Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737–783.
- Smith, N., Thomas, E., & Antoniou, C. (2014). *Multi-National Firms, Corruption and Innovation in Russia*.
- Spicer, A., Dunfee, T. W., & Bailey, W. J. (2004). Does national context matter in ethical

- decision making? An empirical test of integrative social contracts theory. *Academy of Management Journal*, 47(4), 610–620.
- Sterlacchini, A. (1999). Do innovative activities matter to small firms in non-R&D-intensive industries? An application to export performance. *Research Policy*, 28(8), 819–832.
- Svensson, J. (1999). *Who must pay bribes and how much? Evidence from a cross-section of firms*. The World Bank.
- Tanzi, V., & Davoodi, H. (1998). Corruption, public investment, and growth. In *The welfare state, public investment, and growth*, Springer, Tokyo.
- Tavares, J. (2003). Does foreign aid corrupt? *Economics Letters*, 79(1), 99–106.
- Treisman, D. (2000). The causes of corruption: a cross-national study. *Journal of Public Economics*, 76(3), 399–457.
- Ugur, M., & Dasgupta, N. (2011). *Corruption and economic growth: A meta-analysis of the evidence on low-income countries and beyond*. Retrieved from <https://mpa.ub.uni-muenchen.de/31226/>
- Van Beveren, I., & Vandebussche, H. (2010). Product and process innovation and firms' decision to export. *Journal of Economic Policy Reform*, 13(1), 3–24.
- Van Vu, H., Tran, T. Q., Van Nguyen, T., & Lim, S. (2018). Corruption, Types of Corruption and Firm Financial Performance: New Evidence from a Transitional Economy. *Journal of Business Ethics*, 148(4), 847–858.
- Veracierto, M. (2008). Corruption and innovation. *Economic Perspectives*, 32(1), 125-150.
- Vial, V., & Hanoteau, J. (2010a). Corruption, Manufacturing Plant Growth, and the Asian Paradox: Indonesian Evidence. *World Development*, 38(5), 693–705.
- Vial, V., & Hanoteau, J. (2010b). Corruption, Manufacturing Plant Growth, and the Asian Paradox: Indonesian Evidence. *World Development*, 38(5), 693–705.
- Wagner, J. (2007). Exports and productivity: A survey of the evidence from firm-level data. *World Economy*, 30(1), 60–82.
- Wakelin, K. (1998). Innovation and export behaviour at the firm level. *Research Policy*, 26(7–8), 829–841.
- Wang, Y., & You, J. (2012). Corruption and firm growth: Evidence from China. *China Economic Review*, 23(2), 415–433.
- Wei, S.-J. (2000). How taxing is corruption on international investors? *Review of Economics and Statistics*, 82(1), 1–11.
- Wei, S.-J., & Kaufmann, D. (1999). *Does grease money speed up the wheels of commerce?* The World Bank.
- White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica: Journal of the Econometric Society*, 817–838.

- Wieneke, A., & Gries, T. (2011). SME performance in transition economies: The financial regulation and firm-level corruption nexus. *Journal of Comparative Economics*, 39(2), 221–229.
- Williams, C. C., & Kedir, A. M. (2016). The impacts of corruption on firm performance: some lessons from 40 african countries. *Journal of Developmental Entrepreneurship*, 21(04), 1650022.
- Williams, C. C., Martinez-Perez, A., & Kedir, A. (2016). Does bribery have a negative impact on firm performance? A firm-level analysis across 132 developing countries. *International Journal of Entrepreneurial Behavior & Research*, 22(3), 398–415.
- Wu, X. (2009). Determinants of Bribery in Asian Firms: Evidence from the World Business Environment Survey. *Journal of Business Ethics*, 87(1), 75–88.
- Xia, H., Tan, Q., & Bai, J. (2018). Corruption and Technological Innovation in Private Small-Medium Scale Companies: Does Female Top Management Play a Role? *Sustainability*, 10(7), 2252.
- Zare Mehrjerdi, M., & Saghaian, S. (2019). *Corruption and Regulation across firms in selected developing countries*.
- Zelekha, Y., & Sharabi, E. (2012). Corruption, institutions and trade. *Economics of Governance*, 13(2), 169–192.

ANNEXURE A:

List of Countries Income groups

HIGH INCOME, Argentina, Antigua and Barbuda, Bahamas, Barbados, Chile, Croatia, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Israel, Korea, Latvia, Lithuania, Oman, Poland, Portugal, Russia, Saudi Arabia, Slovakia, Slovenia, Spain, St. Kitts and Nevis, Sweden, Trinidad and Tobago, Uruguay, Venezuela.

LOW INCOME, Afghanistan, Benin, Burkina Faso, Burundi, Cambodia, Central Afri Rep, Chad, Congo, Dem. Rep, Eritrea Ethiopia, Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mozambique, Nepal, Niger, Rwanda, Sierra Leone, South Sudan, Tanzania, Togo, Uganda, Zimbabwe.

LOWER MIDDLE INCOME, Armenia, Bangladesh, Bhutan, Bolivia, Cabo Verde, Congo, Rep, Ghana, Guyana, Honduras, Kenya, Kosovo, Kyrgyz Republic, Lesotho, Mauritania, Micronesia, Moldova, Myanmar, Nicaragua, Pakistan, Papua New Guinea, Philippines, Samoa, Senegal, Solomon Islands, Somaliland, Sri Lanka, Swaziland, Syria, Tajikistan, Timor-Leste, Ukraine, Uzbekistan, Vietnam, West Bank and Gaza, Yemen, Zambia, India, Côte d'Ivoire, Cameroon, Djibouti, Egypt, El Salvador, Georgia, Indonesia, Lao PDR, Morocco, Sudan.

UPPER MIDDLE-INCOME COUNTRIES, Albania, Algeria, Angola, Azerbaijan, Belarus, Belize, Bosnia, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Fiji, Gabon, Grenada, Iraq, Jamaica, Jordan, Kazakhstan, Lebanon, Macedonia, FYR, Malaysia, Mauritius, Mexico, Mongolia, Montenegro, Namibia, Panama, Paraguay, Peru, Romania, Serbia, South Africa, St. Lucia, St. V. G, Suriname, Thailand, Tonga, Tunisia, Turkey.

ANNEXURE B:
List of Countries Regional groups

EAST ASIA AND PACIFIC, Cambodia, China, Fiji, Indonesia, Lao PDR, Malaysia, Micronesia, Mongolia, Myanmar, Papua New Guinea, Philippines, Samoa Solomon Islands, Thailand, Timor-Leste, Tonga, Vanuatu, Vietnam.

EASTERN EUROPE & CENTRAL ASIA, Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, Kazakhstan, Kosovo, Kyrgyz Republic, Latvia, Lithuania, Macedonia, FYR, Moldova, Montenegro, Romania, Russia, Serbia, Tajikistan, Turkey, Ukraine, Uzbekistan.

LATIN AMERICA & CARIBBEAN, Antigua and Barbuda, Argentina, Bahamas, Barbados Belize, Bolivia, Brazil, Colombia, Costa Rica, Dominica, Dominican Republic Ecuador, El Salvador, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Middle EAST & NORTH AFRICA, Algeria, Djibouti, Egypt, Iraq, Jordan, Lebanon, Morocco, Oman, Saudi Arabia, Somaliland, Syria, Tunisia, West Bank and Gaza, Yemen

OECD, Chile, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Israel, Korea, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden.

SOUTH-ASIAN, Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka.

SUB-SAHARAN AFRICA, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo, Rep., Côte d'Ivoire, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho,

Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone ,South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.