VIETNAM NATIONAL UNIVERSITY, HANOI
VIETNAM JAPAN UNIVERSITY

NGUYEN THI NGAN

CORRUPTION AND INNOVATION: A CASE STUDY OF SMALL AND MEDIUM-SIZED ENTERPRISES IN VIETNAM

MASTER'S THESIS

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RESEARCH SUPERVISORS:

PROF. ATSUSHI KATO

DR. NGUYEN THI THANH MAI

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STATEMENT OF COMMITMENT

I acknowledge and fully understand the regulations against plagiarism. I pledge with my honor that the research presented herein is entirely my work and adheres to the Regulations on Prevention of Plagiarism in Academic and Scientific Research Activities at Vietnam Japan University, as outlined in Decision No. 700/QD-DHBVN dated 30/09/2021 by the Rector of Vietnam Japan University. This thesis is submitted as part of the requirements for the master's degree in Global Leadership. Any external sources utilized are duly acknowledged through explicit references.

Signature

Nguyen Thi Ngan

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ABSTRACT

Corruption's effects on firm innovation are intricate and still not fully understood, with existing theoretical and empirical evidence remaining inconclusive. This research utilizes econometric methods to analyze data from small and medium-sized manufacturing enterprises in Vietnam, aiming to evaluate how access to illicit funds affects firm innovation. The findings partially support the notion that corruption can grease the wheels of innovation. Specifically, the study reveals that access money encourages innovation outputs, although it does not appear to affect innovation inputs. Given Vietnam's economic landscape, characterized by crony capitalism and interest groups, the role of access money in fostering innovation activities is not entirely surprising, albeit its operational mechanism remains largely enigmatic.

Keywords: Corruption, Innovation, SMEs

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LIST OF ABBREVIATIONS

CIEM	Central Institute of Economic Management
CIS	Community Innovation Surveys
CPI	Corruption Perceptions Index
EU	European Union
FDI	Foreign Direct Investment
GCI	Global Corruption Index
GDP	Gross Domestic Product
GSO	General Statistics Office
ILSSA	Institute of Labor Science and Social Affairs
OECD	Organization for Economic Cooperation and Development
PCI	Provincial Competitiveness Index
R&D	Research and Development
SII	Summary Innovation Index
SMEs	Small and Medium-sized Enterprises
TI	Transparency International
UNDP	United Nations Development Programme
UNODC	United Nations Office on Drugs and Crime
US	The United States of America

CHAPTER 1: INTRODUCTION

1.1 Research background

Human beings now lead significantly healthier, longer lives, enjoying comforts that would have been beyond the imagination of those living centuries ago. Scientific and technological advancements or innovations have played a pivotal role in this transformation and will continue to be essential foundations for future endeavors toward shared progress (Johnson & Acemoglu, 2023). In this digital era, there is an ever-increasing interest in understanding the factors that either foster or hinder innovation (Thurnherr, 2020).

Given that innovation is particularly susceptible to rent-seeking behaviors, corruption can exert a substantial influence on a country's trajectory (Thurnherr, 2020). Research has proposed two primary theories regarding the impact of corruption on innovation (Méon & Sekkat, 2005). The first theory suggests that corruption acts as a "grease" for company growth, thereby benefiting the economy. Conversely, the second theory characterizes corruption as "sand," implying that it imposes costs on economic activity (Xia, Tan & Bai, 2018). Indeed, the impact of corruption on innovation remains ambiguous (Pluskota, 2020). The precise effects of corruption on innovation and economic performance are complex and may vary depending on contextual factors and the specific mechanisms through which corruption operates (Doan, Vu, Tran-Nam & Nguyen, 2021).

On the one hand, corruption can potentially hinder economic outcomes by impeding innovation, reducing competitiveness, and dampening productivity (Mo, 2001; Lambsdorff, 2003). On the other hand, corruption may act as speed money assisting companies in circumventing cumbersome bureaucratic barriers, thereby facilitating market entry strategies (Cíeslik & Goczek, 2015). Furthermore, as found in a recent study by Ang (2020), corruption could even spur economic growth by fostering investment and technological transfer. Examining the impacts of different types of corruption in China on economic performance, Ang (2020) asserts that although

corruption is undesirable in every economy, not all types of corruption are equally harmful to economic actors. Besides speed money, there is another type of corruption that could grease economic wheels in the short run: access money. Access money refers to significant rewards provided by wealthy capitalists to influential officials in return for exclusive privileges (Ang, 2020). Beyond merely lubricating administrative burdens, access money opens business opportunities and creates profit from securing government contracts through political networks (Ang, 2020). However, existing literature supporting the "Grease the wheels" theory over-focus on speed money and tends to consider all types of corruption as a tax rather than an investment for future profit (Ang, 2020). This study seeks to address this theoretical gap by delving deeper into the effects of access money within the Vietnamese context. The author argues that access money serves as a means to secure market demand and guarantee a firm's monopolistic position.

Corruption stands as a multifaceted issue entwined with social, economic, and political dimensions, its prevalence varying across nations (Thurnherr, 2020). According to the United Nations Office on Drugs and Crime (UNODC), estimating corruption proves intricate due to its clandestine nature, rendering direct measurement unfeasible (UNODC, 2018). Corruption has only recently become a subject of serious inquiry, particularly within the last two decades (Thurnherr, 2020). The 2030 Agenda for Sustainable Development, passed by the United Nations General Assembly on September 25, 2015, recognizes corruption as a significant barrier to the achievement of sustainable development (UNDP). Goal 16 of the Agenda for Sustainable Development emphasizes the importance of constructing inclusive, just, and peaceful societies that ensure equitable access to justice and uphold human rights, a robust rule of law, and effective governing across all levels (UNDP). These ideals require institutions that are transparent, efficient, and accountable, devoid of corruption. By endorsing the indicators for Sustainable Development Goals developed by the United Nations Statistical Commission, the General Assembly stressed the significance of basing these indicators primarily on domestic data, encouraging countries to incorporate these measures into their national official statistics (UNODC, 2018).

During this period, numerous methodologies for assessing corruption have arisen, among them are two popular indices: The Corruption Perceptions Index (CPI) and the

Global Corruption Index (GCI). The Corruption Perception Index published annually by Transparency International (TI) presents an overall view of the relative level of corruption in 180 countries and territories around the world based on perceptions of corruption in the public sector (Transparency.org, 2022). The index aggregates data from 13 external sources, including the World Bank, the World Economic Forum, consulting firms, and other organizations. Scores reflect the opinions of experts and business people, and higher scores mean more transparency and less corruption (Transparency.org, 2022). Meanwhile, GCI evaluates corruption and white-collar in 196 countries and territories. It relies on up to 42 internationally recognized variables and includes two sub-indexes to provide both a comprehensive global risk overview and a more detailed risk assessment. Country scores range from 0 to 100, with 0 reflecting the lowest level of risk and 100 denoting the highest level of risk (Risk-indexes.com, 2023).

With the emergence of corruption measurements, many studies have been conducted in an attempt to evaluate the impacts of corruption on innovation at the national level (Krastanova, 2014; Trinh, 2019; Xu & Yano, 2017). A study published by Thurnherr in 2020 analyzing data on national corruption level (measured by GCI) and innovative capability from 140 countries finds an important correlation between these two figures. Countries characterized by high levels of corruption tend to exhibit lower probabilities of benefiting from innovation capabilities. While this general observation does not imply a causal relationship, there is indeed a correlation between corruption and diminished levels of innovation capacity at the country level (Thurnherr, 2020). Using annual data spanning from 1996 to 2013 across 29 OECD countries, Wen et al. (2023) investigate how corruption influences domestic innovative activity, assessed by the number of patents. Their findings suggest that reducing corruption has a significant impact on patent applications. Employing data from 2002 to 2014 of 110 emerging countries from four continents (Asia, Africa, Europe, and Latin America), Pirtea, Sipos and Ionescu (2019) focus on analyzing the possible influence of corruption on corporate innovation activities in developing economies. The empirical analysis from the study confirms that corruption significantly and adversely affects the innovation processes of

companies in emerging countries. Corruption fosters a hostile and unstable environment that deters corporate innovation efforts (Pirtea et al., 2019).

Nearly 40 years after Doi Moi, Vietnam has successfully transformed from a war-ravaged, centrally planned economy to a vibrant and open market economy (World Bank, 2016). The country has been praised by the international community as a remarkable poverty reduction story and is on its road to becoming a high-middle-income country. Vietnam has successfully maintained an impressive annual growth rate of 7% since 1986, placing it as one of the fastest-growing economies in the region (Bai, Jayachandran, Malesky & Olken, 2019). The country has set an ambitious goal of becoming a high-income country by 2045. Despite noticeable economic outcomes over the past four decades, the concerns over whether the country could sustain its success and meet the expectations for the future remain hotly debated (Cirera, Comin, Lee & Neto, 2021). The key to sustainable growth relies on the innovative capability and the speed of increasing labor productivity (World Bank, 2016).

However, in reality, the application and adoption of technology in both the manufacturing and service sectors in Vietnam, are still very low (Cirera et al., 2021). Among surveyed sectors, manufacturing firms are facing the biggest technological gaps, surpassing that of services and agriculture firms. A report by the World Bank shows that when measuring the technology level of the economy from level 1 to level 5, Vietnam only reaches 2.5, while in advanced economies such as Korea - the average level is 4 (World Bank, 2023). Investment in research and development (R&D) in Vietnam is also relatively limited compared to others in Asia. In 2021, Vietnam spent only about 0.5% of its GDP on R&D investment, whereas the figures for Thailand and South Korea were roughly 0.8% and 4.5%, respectively (World Bank, 2023).

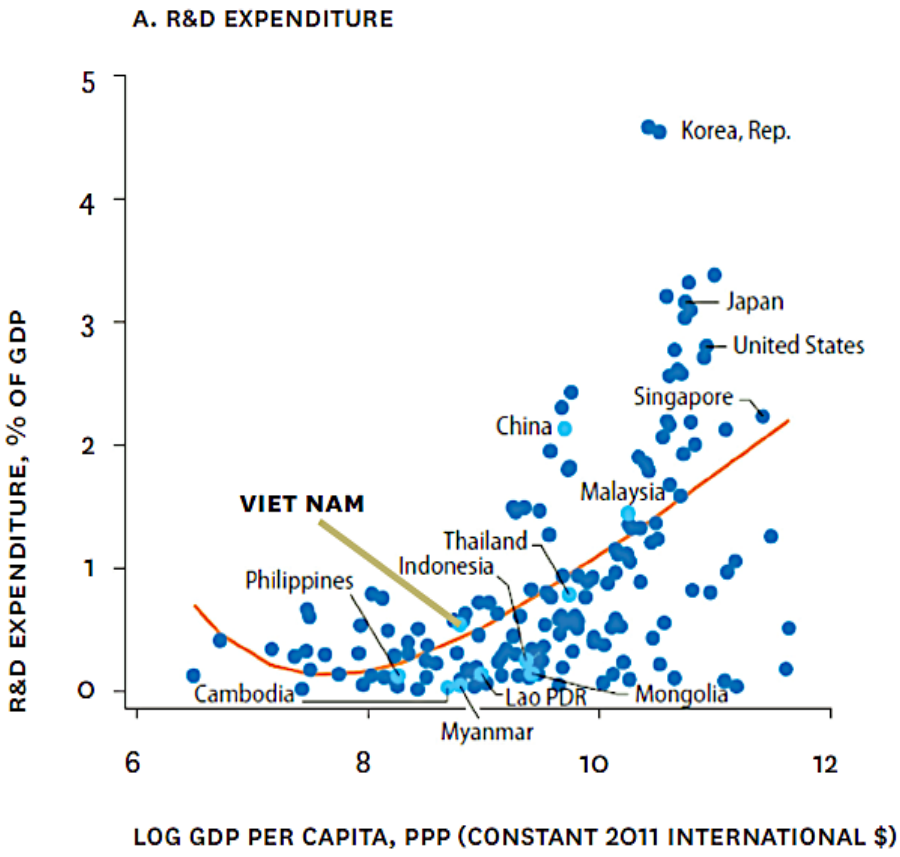

Figure 1: *R&D expenditure relative to GDP per capita, 2020 (Source: Cirera et al., 2021)*

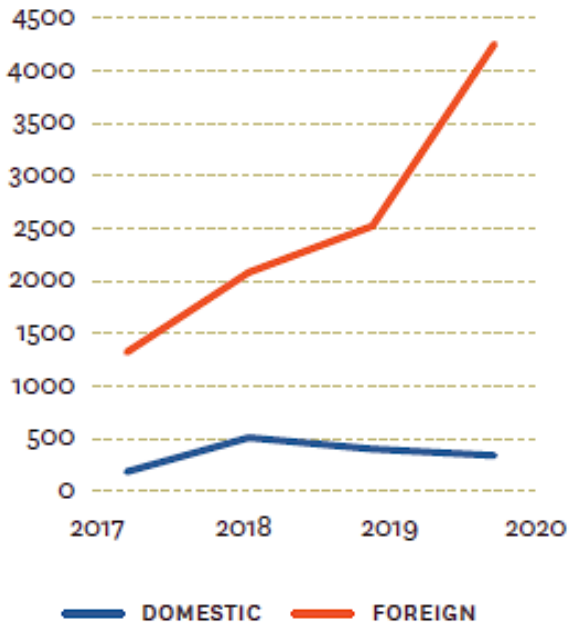

Figure 2: Patents granted by inventor origin in Vietnam, 2017–2020 (Source: World Bank, 2023)

Regarding the number of patents on the technology, the figure for inventions in Vietnam is significantly lower than that of some countries in South East Asia such as Thailand and Malaysia. What is even more worrying is that the majority of current patents (over 90%) are registered and owned by foreign investors, while there are only a few patents owned by domestic firms (World Bank, 2023). The trivial contribution of the domestic private sector puts the economy at risk of depending on foreign firms.

Meanwhile, Vietnam will soon experience mounting burdens from an aging population that will likely hinder the country's ambition to attain high-income status by 2050. A report in 2021 from JICA and the World Bank projects that Vietnam will become an aged society by 2035, making it one of the fastest-aging societies in the world (Glinskaya et al., 2021). For the first time in its history, Vietnam reached a pivotal moment in 2023 when its fertility rate fell to 1.96, which is actually below the replacement rate and is expected to continue to fall in the coming years (GSO, 2023). This ongoing trend has accelerated another concerning incident: the time when Vietnam will not have enough people in the working age to power its growth. The country could no longer take advantage of its cheap and abundant labor source. This looming demographic crisis might lead to an unfavorable scenario when the country moves away from its high-income target and gradually falls into the middle-income trap.

Upgrading labor quality and boosting innovative capacity are urgent tasks for the Vietnamese government to prepare for future unwanted demography (Glinskaya et al., 2021). The humble contribution of Vietnamese domestic firms urgently needs to be analyzed when it comes to fostering the innovative capacity of the whole economy. The thorough and insightful analysis will provide solid scientific evidence for the policy-making process and for designing long-term development strategies.

At the current stage of the economy, domestic private enterprises contribute 57% of Vietnam's GDP and employ almost 60% of the labor force (Tran, 2022). The private sector has been regarded as the potent engine of Vietnam's economy since the reform in 1986 (Bai et al., 2019). According to The General Statistics Office of Vietnam, Small and Medium-sized Enterprises (SMEs) account for 97% of Vietnamese companies. Annually, SME businesses contribute about 40% of GDP, accounting for 33% of

industrial output and 30% of export value, and attract nearly 51% of workers (GSO, 2023).

Data from the World Bank Enterprise Survey shows that Vietnamese SMEs are relatively innovative in products and processes, including the application of automation (Thanh, 2021). However, spending on R&D activities is quite limited, innovation in SMEs is mostly "frugal innovation" mainly based on existing production lines, such as making small modifications to existing products to make them more accessible to consumers (Thanh, 2021). A survey conducted by the Trade and Competition Sector of the World Bank Group reveals that Vietnamese enterprises spend 1.6% of annual revenue on R&D activities, lower than that of many countries in the region such as Laos (14.5%), Philippines (3.6%), Malaysia (2.6%), Cambodia (1.9%) (World Bank, 2020). Unlike other economies in the region, investment in innovation in Vietnam mainly depends on the public sector, with up to 56% contribution from state-owned enterprises, the report said. Vietnamese firms also spend less on purchasing or licensing patents for the development of new products and processes compared to their counterparts in other countries in the region. According to information from the Ministry of Science and Technology, due to the specific nature of business scale and operational strategy, most SMEs do not have or lack a specialized department responsible for R&D activities, which are often integrated into another department such as the production department and sales department (Most.gov.vn, 2021). Fostering and nurturing innovative activities in SMEs not only increases the competitiveness of the private sector but also strengthens the resilience of the Vietnamese economy against global economic shocks.

Despite its profound importance, Vietnamese enterprises are still facing severe challenges from the business environment as is the case with many other emerging markets. Research by Tuyến and Hưởng (2018) shows that access to land (1), low-quality labor force (2), outdated technology (3), and corruption (4) are the main obstacles to firms' operations and innovative activities. In effect, recent statistics show that corruption is still a major challenge in the Vietnamese investment environment. Provincial Competitiveness Index (PCI) 2023 records opinions from 9000 domestic private enterprises and more than 1,500 FDI enterprises showing that one-third of businesses participating in the survey still have to make informal payments to public

officials (Bao, 2024). Therefore, research on evaluating the impacts of corruption on the economy in general, and innovation activities of the private sector in particular at this time (in the context of Vietnam) is extremely necessary for policymakers to be able to make timely and effective policies.

To the best of the author's knowledge, there have been two studies examining the effects of corruption on innovation in Vietnamese SMEs, specifically focusing on petty corruption and tax corruption. The initial study, carried out by Anh, Minh, and Tran-Nam in 2016, aimed to evaluate the impacts and mechanisms by which petty corruption affects firm innovation. Utilizing panel data from Vietnamese Small and Medium-Sized Manufacturing Enterprises covering the years 2005 to 2011, the research revealed a positive and statistically significant correlation between corruption and firm innovation. Moreover, the study found that corruption influences multiple facets of innovation, encompassing overall innovation, product improvement innovation, and the introduction of a new product.

The second study, conducted by Doan, Vu, Tran-Nam, and Nguyen in 2021, also utilized the same dataset of SMEs to explore the association between tax corruption and innovation spanning from 2005 to 2015. Tax corruption has become a widespread practice in Vietnam's business landscape, where companies frequently encounter obstacles and extra expenses to streamline tax procedures. According to the 2023 Provincial Competitiveness Index (PCI) report, a significant portion (around 55%) of businesses operating in Vietnam still have to pay informal fees to tax officials. Moreover, about 35% of businesses find tax-related processes to be the most burdensome (Quân, 2023). In this context, it is clear that many businesses resort to paying tax bribes as a way to navigate the challenges and hassles present in the business environment. The study found that tax administration corruption in Vietnam positively influences innovation inputs and outputs in small and medium-sized enterprises. The results suggest that paying tax bribes can facilitate various types of innovative activities within SMEs, including both innovation inputs (such as R&D expenditure) and outputs. The authors hypothesize that tax corruption could stimulate firm-level innovation by providing SMEs with “tax savings" resulting from engaging in corrupt practices. These savings can serve as a crucial source of funds for SMEs, enabling them to finance

business expansion and enhancement, including investments in innovation inputs. The notion that tax savings would be reinvested in innovation is somewhat vague and lacks strong evidence. There is no assurance that these savings would be specifically allocated to investment in innovation rather than other forms of spending such as paying debts. Without clear incentives to ensure that tax savings will be directed towards innovation, it is unpersuasive to rely on this argument.

1.2 Overall goal of the study

This study aims to empirically examine and evaluate the impacts of access money (one type of corruption) on firms' innovative activities, specifically considering the case of Vietnamese SMEs.

1.3 Contribution of the research

The present study aims to contribute to the existing literature with empirical evidence on the impact of corruption on innovation activities in Vietnam. *First,* to the best of the author's knowledge, this is the first study to inquire about the effects of access money on innovation in Vietnam. Previous studies evaluate the impact of corruption in general, petty theft, and speed money without paying much attention to access money (Anh et al., 2016; Doan et al., 2021). *Second,* the research aims to contribute to theoretical discussions on the influence of access money on firms' innovative activities. Whereas access money is one of the prevalent forms of corruption, the analysis on this topic is relatively limited. This study argues that access money might foster a firm's innovation in a completely different mechanism compared to other types of corruption. Scholars often associate corruption with an informal fee or a tax burden that companies have to pay when they operate their businesses. However, in the case of access money, it acts as an active investment that firms use to secure future profits rather than the demand from public officials (Ang, 2020). When companies can foresee and secure lucrative deals, investment in technology and production capacity follows.

Using empirical evidence from the Vietnamese SMEs combined with qualitative analysis of a case study in the Vietnamese pharmaceutical market, the author expects to provide some insights into the operating mechanism and impacts of access money,

further contributing to the theoretical discussions on the interdependence of corruption and innovation.

1.4 Research objectives

The research has two objectives:

- The first objective is to investigate the current state of innovation among SMEs in Vietnam.
- The second objective seeks to analyze the impacts of one type of corruption (access money) on innovative activities (measured by the innovation inputs and innovation outputs) in Vietnam.

1.5 Research questions

The study aims to answer two questions below:

1) What are the current innovation practices and trends among SMEs in Vietnam?
2) How does corruption, particularly in the form of access money, affect the innovation inputs and outputs of SMEs in Vietnam from 2011 to 2015?

1.6 Scope of the study

The study investigates the impacts of access money on innovative activities in more than 2500 Vietnamese SMEs in 10 provinces in Vietnam from 2011 to 2015. The selection of Vietnam as the focus of this study is based on several compelling reasons.

Firstly, Vietnam is classified as a low-middle-income country, where the majority of manufacturing roles consist of assembly work, generating low value in the global value chain (United Nations Industrial Development Organization, 2020). Therefore, innovative activities in domestic enterprises would be the key to maintaining the competitive advantages of the country and compensating for the labor force's loss due to the declining birthrate.

Secondly, Vietnam like many other emerging economies, has been experiencing rampant corruption. In effect, corruption has been a persistent socio-political problem in Vietnam for many years. It has been going on for decades, occurring in many aspects of social life, greatly affecting economic development and eroding people's trust (Giang, 2023). Existing studies have shown that higher economic growth often leads to

a lower level of corruption (Treisman, 2000; Bai et al., 2013; Bai et al., 2019). Vietnam is no exception. Along with economic progress, the country has significantly improved its position on the Transparency International rankings. From 2010 to 2020, the country's ranking increased by 10 (from 116th to 104th). However, corruption remains prevalent in Vietnam, and bribery still imposes substantial burdens on businesses (Giang, 2023). Vietnam's position on the CPI (Corruption Perception Index) rankings in 2022 is 77 out of 180 countries, with 42 out of 100 points slightly below the average score of the Asia Pacific region (45 points).

Lastly, research exploring the effects of corruption on innovation in the world in general and in Vietnam in particular, is relatively scarce. While much of the existing literature on corruption focuses on its relationship with economic growth, findings are highly context-dependent and present a complex narrative. Studies tailored to emerging economies like Vietnam would be useful to nations facing corruption and trying to catch up with the latest technologies. Coming from a humble beginning, success in solving poverty, and now struggling to overcome the middle-income trap, Vietnam offers a typical example of a developing country endeavoring to become a prosperous state.

CHAPTER 2: LITERATURE REVIEW AND THE THEORETICAL FRAMEWORK

2.1 Definition of SMEs

Small and Medium Enterprises are a crucial component of most economies, especially in emerging countries. They constitute the majority of businesses and are significant drivers of job creation and economic progress. SMEs make up approximately 90% of business and contribute to over 50% of total employment worldwide (World Bank, 2019).

A paper from the World Bank (2003) points out that the concept of SMEs encompasses various definitions and metrics, which differ across countries and reporting sources (Ayyagari & Beck, 2003). Common criteria include the number of employees, total net assets, sales, and investment levels. However, employment is typically the predominant basis for defining SMEs, although there is variation in setting the upper and lower size limits (Ayyagari & Beck, 2003). It's important to note that SMEs are formal enterprises and are distinguished from informal ones. In this part of the study, the author presents two major definitions, one from the World Bank and one from the Vietnamese government. According to the World Bank classification, micro-businesses consist of less than ten employees, while small firms employ between 10 and 49 workers, and medium-sized companies have staff ranging from 50 to 300 individuals (Ayyagari & Beck, 2003).

Decree No. 39/2018/ND-CP issued by the Vietnamese government outlines the classification of small and medium-sized enterprises based on size criteria. According to this decree, micro-enterprises in sectors such as agriculture, forestry, fisheries, industry, and construction are defined as having an average annual employee count participating in social insurance of no more than 10 people and a total annual revenue not exceeding 3 billion VND (Government of the Socialist Republic of Viet Nam, 2018). Micro-enterprises in commerce and services are similarly categorized but with a higher revenue threshold of 10 billion VND.

Small enterprises in sectors like agriculture, forestry, fisheries, industry, and construction are characterized by an average annual employee participation in social insurance of no more than 100 people and a total annual revenue not surpassing 50 billion VND. In the commerce and services sector, small enterprises have an average annual employee count participating in social insurance of no more than 50 people and a total annual revenue not exceeding 100 billion VND.

Medium-sized enterprises in sectors like agriculture, forestry, fisheries, industry, and construction are those with an average annual employee participation in social insurance of no more than 200 people and a total annual revenue not exceeding 200 billion VND. Medium-sized enterprises in commerce and services are defined by an average annual employee count participating in social insurance of no more than 100 people and a total annual revenue not surpassing 300 billion VND.

This study employs a secondary data set classifying firm size based on suggestions from the World Bank. Small and medium-sized companies are firms that have fewer than 300 employees.

2.2 Corruption

2.2.1 Definition of corruption

It should be recognized that it can be challenging to determine which actions are corrupt and which are not. Typically, every society has a custom of giving gifts and favors. In ancient Greece, the word “dorodokein” was used to refer to bribery. The word literally means “receiving gifts” without any moral justifications associated with it (Taylor, 2001). According to Carlà-Uhink, the term “corruption” is ambiguous, despite its Latin roots – “corruption” – unambiguously communicating the message of “destruction, degradation, and collapse” (Horn-Conrad, 2022). However, not everything that is popularly viewed as corrupt violates applicable laws. An act of corruption can stem from economic, political, ethical, or even legal motives. It is this complex and multidimensional nature of corruption that makes assessing and combating corruption challenging. This study utilizes Bardhan’s definition in 1997 which interprets corruption as the act of misusing power by public officers for personal benefit (Bardhan, 1997).

In effect, corruption has been a pervasive and persistent phenomenon in human society since its beginning, manifesting in a variety of forms (Agrawal, 2007; Kuru, 2022; Ortiz-Ospina & Roser, 2024). Corruption has existed in all levels of bureaucracy in different stages of political development, making it an ever-present obstacle in every political institution (Braibanti, 1962). Historical records and current empirical evidence both support this argument highlighting the persistence and prevalence of this popular disease (Kuru, 2022; Ortiz-Ospina & Roser, 2024).

Corruption was recorded in several earliest civilizations on Earth. One of the very first cases of corruption appeared in ancient Egyptian society during the first dynasty from 3100 BC in the judicial system (El-Saady, 1998). Similar corruption cases also occurred in ancient Greece. Corruption has existed in Athens since the fifth century and has become an indispensable part of political life in the cradle of democracy (Taylor, 2001; Kuru, 2022). The corruption situation here was so serious that the Athens authorities enacted the strictest laws to prevent officials from embezzling public funds and demanding bribes from citizens. Accordingly, corrupt officials would be stripped of their citizenship rights and the right to participate in state agencies. These were considered one of the heaviest punishments in Athenian society at that time (Taylor, 2018).

In the history of Vietnamese feudal dynasties, many laws had provisions for punishing officials for embezzlement and corruption, a typical instance of which is the Royal Penal Code of the Le Dynasty. The Royal Penal Code of Le Dynasty has 722 articles, including 40 articles related to anti-corruption, a crime considered dangerous and seriously affects the king's reputation (Le, 2022). The harshest penalties related to corruption in this law include removal from positions and even death penalty.

As the global economy has increasingly integrated and expanded since the beginning of the 20th century, the scale and sophistication of corruption have been considered to be significantly increased. Due to the complex nature and secrecy of corrupt activities, measuring corruption remains a challenge for the international community. One of the indices widely known as a corruption estimation tool is the Corruption Perception Index (CPI) from Transparency International. Starting in 1995, CPI ranked the level of

corruption in 180 countries and territories based on surveys of experts and businessmen's opinions on the level of corruption in the public sector, on a scale of 0 to 100 corresponding to the level "highly corrupt" to "very clean" (Transparency.org, 2024). In its 2023 report, Transparency International indicates that global corruption is at an alarming level when 80% of the world's population is living in countries with serious corruption status (Transparency.org, 2024). According to this report, there is a stark difference in the corruption level between countries associated with democratic and authoritarian institutions. Nordic countries are evaluated to be the least corrupt whereas corruption is especially worsened in authoritarian regimes with lower incomes, weak institutions and constantly exposed to conflicts.

According to Transparency International (2024), leading the 2023 CPI index is Denmark with 90 points, followed by Finland and New Zealand with 87 and 85 points respectively. Singapore is the only country in the Southeast Asia in the top 10 with 83 points. The list of worst performers includes several African countries: Somalia (11 points), Syria, Venezuela, and South Sudan with 13 points, the lowest scores in 2023. Assessed by region, Western Europe and the European Union have the highest average score with 66 points; Asia-Pacific is 45 points; Eastern Europe and Central Asia are 35 points; Sub-Saharan Africa is the lowest with 33 points (Transparency.org, 2024).

It would be acknowledged that the cost of corruption could not be evaluated comprehensively in terms of monetary value without considering its greater impacts on weakening social contracts and political institutions. However, quantitative measurements could give the stakeholders and policymakers a sense of how detrimental corruption is concerning economic loss (Laing, 2023). Due to the sensitivity of this political phenomenon, empirical research concerning its' financial consequences has been relatively limited. A paper from the International Monetary Fund (IMF) estimates that corruption causes a loss of US $ 4.5 trillion annually, accounting for about 5% of global GDP (Laing, 2023). Overall, less wealthy economies suffer greater damages (approximately 30% of the national budget) compared to more prosperous states (23%). The detriment caused by corruption also varies across geographical areas as Sub-Saharan Africa experiences the most financial impairments at almost 27.8% of their government's expenditure while countries from North America pay the least at 18.9%.

This could be explained by differences in institutions, natural resources as well as armed conflicts happened in these areas (Laing, 2023). Corruption and dishonesty tend to be worsened in developing countries due to an array of factors associated with the state of underdevelopment, including significant imparity in distributing wealth, public service being seen as the primary way of obtaining a share of prosperity, a shortage of regulation systems in the society and the government, and the lack of a strong sense of nationalism (Bryce, 1921; Bai et al., 2019).

2.2.2 Classification of corruption

Different scholars classify corruption in different ways. Nye (1967) categorizes corruption based on the purpose of corrupt action. According to Nye, there are three types of corruption including bribery, nepotism (the act of granting privileges to relatives or close acquaintances), and misappropriation (illegal appropriation of public resources). Meanwhile, Ang (2020) classifies corruption based on the ranking of officials involved and the scale of the corrupt cases. In Ang's framework, there are four types of corruption namely petty theft, grand theft, speed money, and access money. Petty theft refers to the misappropriation of funds from the government or blackmail by street-level government officials. Grand theft is the misuse or abuse of significant amounts of public funds by the politicians controlling national finances. Speed money implies small bribes paid to authorities by firms or citizens to get past obstacles or speed up the process, and access money includes noticeable rewards given to high-ranking officials by businessmen, not simply to accelerate the procedure, but also to gain lucrative profits such as winning construction contracts. Unlike other kinds of corruption which are always illegal, access money can include both legal and illegal activities. Legal activities focus on cultivating political relationships such as campaign financing and lobbying. Illegal actions include kickbacks or massive gifts. This research applies Ang's framework to characterize corruption.

2.2.3 Measuring corruption

a) Indirect measurement

According to a guideline from UNODC (2018), measuring corruption poses formidable challenges, akin to gathering evidence for any criminal offense. Corruption,

being clandestine in nature, complicates the acquisition of accurate data. Victims often hesitate to report it due to fear of retaliation, reluctance to challenge entrenched practices, or a sense of complicity, rendering corruption reporting less frequent compared to other crimes. Also, from this guiding text, in the early stages of corruption measurement, the complexity of gathering relevant evidence led to the adoption of indirect approaches, where assessment methods not reliant on direct observation of the phenomenon were favored. The primary indirect approaches utilized in assessing corruption, both domestically and internationally, include:

- **Evaluations from experts:**

This method involves evaluations from a designated panel of specialists regarding corruption trends and behaviors within a specific nation or a set of nations. The fundamental concept underlying expert assessments is to gather concise insights from individuals who are familiar with the subject matter being examined. Within the realm of corruption, such techniques have been employed in integrity, governing, and competitiveness evaluations (UNODC, 2018).

- **Composite indices**

Composite indices involve amalgamating various statistical data into a single indicator (European Union & Joint Research Centre, 2008). This method is commonly employed to condense multidimensional concepts or compile data sourced from diverse outlets into a cohesive measure. Over recent decades, numerous composite indices focusing on corruption and related subjects have emerged. While these indices could theoretically be derived from evidence-based metrics, they predominantly rely on expert assessments and perception surveys as their primary data sources. In the context of corruption, composite indices incorporate proxy indicators, offering more of a risk assessment rather than a direct measure of the phenomenon's actual level (UNODC, 2018).

Indirect assessment methods, however, possess substantial limitations in terms of validity and applicability (Kiener-Manu, 2018). The formulation of expert evaluations and composite indicator metrics relies heavily on personal assumptions, including

variable selection, source choice, and algorithm determination for amalgamating heterogeneous data. Additionally, indirect methods fail to provide the disaggregated data or comprehensive information on corruption necessary for effective policymaking (UNODC, 2018).

b) Direct measurement

Indeed, certain limitations associated with indirect methods for assessing corruption can be addressed by employing various direct methods (UNODC, 2018). These approaches are designed to gather evidence-based information on corruption through statistical and standardized procedures. Administrative data encompass official records documenting corruption cases from diverse entities such as police, prosecutors, courts, and anti-corruption agencies. Sample surveys, on the other hand, enable the direct gathering of data concerning the experiences of representative samples within a specific population, such as households or businesses (UNODC, 2018). Utilizing direct methods to assess the firsthand experiences of corruption represents the most dependable approach for generating the detailed information essential for policymaking. Relying on evidence-based practices in policy and decision-making remains pivotal in effectively addressing the myriad forms of corruption and the challenges they pose (Nutley, Walter & Davies, 2007).

This study makes use of a secondary data set carried out by the Central Institute of Economic Management (CIEM) and the Institute of Labor Science and Social Affairs (ILSSA) of the Ministry of Labor. The two partners conducted a nationwide survey of private manufacturing businesses in 10 provinces in Vietnam from 2005 to 2015. Regarding evaluating and assessing corruption, the data set utilized a direct method to survey the experience of businesses with informal fees. Questions relating to corruption and bribery include information on whether the company had to pay informal payments in the previous year or not, how much they paid, the purpose of those payments, and how many times they paid. This information will be used to evaluate the situation of corruption in Vietnamese SMEs in Chapter 3.

2.3. Innovation

2.3.1 Definition of innovation

"Innovation" encompasses creativity and novelty, involving the creation of new ideas or improvements to existing ones. While often viewed positively in Western culture, innovation, like any human activity, comes with both advantages and disadvantages. Economists, political philosophers, and artists have been long concerned with weighing these costs and benefits throughout history (Sandefur, 2018).

Innovation could replace the old systems and transform societies by turning new ideas into realities, generating wealth and power as well as displacement and chaos. Joseph Schumpeter, an Austrian economist first introduced the term "creative destruction" in 1942 to illustrate how innovation drives the evolution of a free-market economy (Schumpeter, 2013). He defines it as advancements in manufacturing processes that enhance productivity, portraying it as a continuous cycle of industrial upgrading. This process constantly disrupts the existing economic structure while simultaneously generating new ones. Emerging sectors draw resources from traditional ones, leading to a shift in focus. Established businesses face competition from new firms. Advancing technologies render existing skills and machinery outdated (Acemoglu & Robinson, 2012). "Creative destruction," as Schumpeter (2013) suggests, frequently leads to the obsolescence of longstanding arrangements, thereby freeing resources for alternative utilization and consequently promoting greater economic efficiency.

Modern economic theories advocate innovation as the prime engine of sustainable economic growth and productivity enhancement (Solow, 1957; Romer, 1990). Since the introduction of endogenous growth theory, it is widely believed that the rate of technological progress is what fuels the economy in the long run (Grossman & Helpman, 1991b; Aghion, Akcigit & Howitt, 2014). Therefore, nurturing innovation and creating an ecosystem fostering innovative activities has been one of the central issues of every economic policy in modern times.

This study follows the Oslo Manual's (2005) definition of innovation, which characterizes it as the introduction of a new or substantially enhanced product (good or

service), process, marketing strategy, or organizational approach within business practices.

2.3.2 Classification of innovation

At the firm's level, innovation plays a vital role in determining the firm's performance (Coad & Rao, 2008; Audretsch, Lehmann & Licht, 2017). According to the Oslo Manual (OECD-Eurostat, 2005), there are four types of innovations namely: product innovation, process innovation, marketing innovation, and organizational innovation. *Product innovation* refers to the launch of a new or significantly upgraded product (a good or service). *Process innovation* is the implementation of a new or noticeable improvement in manufacturing methods. The application of a new marketing method such as changes in product packaging is categorized as *marketing innovation*. The last type of innovation is *organizational innovation* referring to the execution of a new business practice.

Firm innovation depends on both internal and external factors. Research on internal factors primarily focuses on firm innovative capacity, management quality spending on research and development (R&D), and labor quality (Hungund & Mani, 2019; Cirera et al., 2021). Meanwhile, external factors such as institutional quality and a supportive business environment have been primary concerns of a variety of research (de Waldemar, 2012; Anh et al., 2016; Paunov, 2016; Wen et al., 2020).

2.3.3 Measuring innovation

This section presents the innovation surveys designed by the Oslo Manual in 1992 as a major guideline for measuring innovation (Gerstein, Plewes & Brown, 2004).

In innovation surveys, firms are typically asked to provide information on various aspects of their innovative activities, covering inputs, outputs, and behavioral and organizational dimensions. Regarding inputs, these surveys assess a firm's intangible assets, which extend beyond research and development (R&D) expenditure. They may include spending on training, acquisition of patents and licenses, product design, trial production, and market analysis.

On the output side, data are collected to determine whether an enterprise has introduced a new product or process, as well as the proportion of sales attributed to

significantly changed or new products. The term "new" can refer to products new to the enterprise, the market, or even the world. Additionally, indicators are used to understand the nature of innovative activities, such as whether R&D is conducted continuously and/or in collaboration with other entities. Other data collected may include the sources of knowledge, reasons for innovation, perceived obstacles to innovation, and the effectiveness of various mechanisms for appropriating the benefits of innovation.

While innovation surveys initially originated in several European countries, they have since been conducted in numerous other countries, including Australia, Canada, all EU member states (where the Community Innovation Surveys [CIS], coordinated by Eurostat, have reached their sixth round in 2008), Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey, as well as Russia, South Africa, and most Latin American countries (OECD, 2009).

Regarding innovation measurement for this study, the data set follows guidelines from the Oslo manual (1992). The data on innovation is taken from direct surveys with business owners, whether the companies implemented any innovative activities in the last two years. Following previous research on the topic (Anh et al., 2016; Doan et al., 2021; Pham & Matsunaga, 2019; Tuyến & Hưởng, 2018), innovative activities in a company are categorized into innovation input and innovation output. Innovation input includes investment in (i) research and development (R&D), (ii) new equipment and machinery, and (iii) patents. Innovation output encompasses (i) the introduction of new product groups, (ii) improvements of existing products, and (iii) the introduction of new production processes or new technology in the last two years. The variable indicates innovation input receives the value of 1 if a company invested in any above aspects (in the last two years). Innovation inputs receive the value of 0 if a company did not invest in any above aspects (in the last two years). Similarly, innovation output is also a dummy variable, receiving the value of 0 and 1. The variable takes the value of 1 if a company introduced new products, new technology, or any improvements to the current products. The value takes the value of 0 if a company did not implement any of those above.

2.3.4 Factors affecting the firm's innovation

a) Firm's characteristics

- **Firm age**

Research from Sørensen and Stuart (2000) shows that the number of operating years of a company has consequential impacts on innovation processes through two opposite mechanisms. Older firms demonstrate an increased competence in producing innovations, as evidenced by the number of patents they generate. The first reason behind this phenomenon is the accumulation of organizational experience and knowledge over time. Older firms have typically been operating in their respective industries for a longer period, allowing them to accumulate valuable expertise, knowledge, and capabilities. This accumulated experience can enhance their ability to innovate and develop new technologies (Cohen & Levinthal, 1990). Aged companies often have well-established networks of collaborators, partners, and stakeholders built over years of operation. These networks provide access to resources, information, and opportunities for collaboration, which can facilitate the innovation process (Coad, Segarra & Teruel, 2016). Finally, older firms may have a more substantial resource base, including financial resources, human capital, and physical infrastructure. These resources can support research and development activities, experimentation, and the implementation of innovative ideas (Schumpeter, 1934).

Conversely, the negative relationship reflects the obsolescence effects, wherein inertia and resistance to change might impede older firms from adapting to new market trends, technologies, and customer demands (Sørensen & Stuart, 2000). Aged companies may become more risk-averse over time, preferring to stick with proven strategies and technologies rather than taking risks on innovative ideas. This risk aversion and the lack of entrepreneurial spirit can limit experimentation, creativity, and the willingness to explore new opportunities for innovation (Radas & Božić, 2009). The firm's age is measured by years of operation of the company.

- **Firm size**

The impact of firm size on innovation can be either positive or negative. In instances where it's positive, larger firms with substantial resources like extensive production capacity, financial backing, and robust marketing infrastructure are more inclined towards engaging in research and development activities and fostering innovation compared to smaller enterprises (Bhattacharya & Bloch, 2004). SMEs, on the other hand, encounter challenges in innovating due to their limited internal expertise resources, affecting their capacity to absorb knowledge and technology. However, small firms might leverage their focused innovation efforts and agility to their advantage (Becheikh, Landry & Amara, 2006). The nature of this relationship can vary based on the characteristics of the industry, the structure of the market, and the strategy of each firm (Acs & Audretsch, 1988; Becheikh et al., 2006). In measuring firm size, the analysis employs the total assets of a company in the previous year.

- **Exporting**

The influence of exports on innovation holds significant importance, as the intense competition in the international market compels exporting companies to innovate as a survival strategy. Venturing into international markets enables firms to access knowledge, expertise, and technologies that may not be available domestically (Lachenmaier & Wößmann, 2006). The utilization of such resources often results in increased productivity and innovation, commonly known as the 'learning-by-exporting' effect. When assessing exports, a binary variable is employed, taking a value of 1 if a company participates in either direct or indirect exporting during that particular year. The variable receives a value of 0 if a company is not involved in any direct or indirect activities.

- **Management quality (Entrepreneurship)**

Paul Romer, a prominent scholar in the field of economic growth, has articulated that innovation arises from a blend of societal structures that nurture growth and the emergence of novel concepts (Jones, 2019). Unlike physical objects, ideas have the unique ability to be shared among many simultaneously, greatly accelerating

technological progress. Thus, while capital, social institutions, and new technology are significant, they alone do not drive growth; they must be complemented by the capacity and inclination for creative thinking and action. The term "creative destruction" describes a dynamic economy characterized by the continual birth and demise of businesses (Schumpeter, 1934). This cycle is instigated by entrepreneurs who translate fresh ideas into viable products and services (Acs & Szerb, 2009; Henderson & Weiler, 2010; Block, Thurik & Zhou, 2013). These innovative entrepreneurs distinguish themselves through their aptitude and readiness to explore and exploit new economic prospects (Wennekers & Thurik, 1999). Therefore, when it comes to a firm's innovation, the role of management skills and entrepreneurship are equally important to other internal factors as the manager is the one who directs the operation and investment in the company.

Cirera et al (2021) explore the relationship between manager education and technology adoption levels in Vietnamese firms. It finds that the education level of managers is positively correlated with the sophistication of technology adoption. Specifically, having a manager with a post-graduation degree or who has studied abroad is associated with higher levels of technology adoption. Furthermore, the study indicates that the education of managers plays a more significant role in technology adoption than the skills of the workforce. The findings suggest that investing in the education and qualifications of managers can enhance a firm's ability to adopt and utilize advanced technologies effectively. This highlights the importance of managerial quality in driving technology adoption and innovation within firms (Cirera et al., 2021). In this study, the education level of the manager is used as the proximity for the management quality. The hypothesis is that companies with the manager owning a college degree (or higher) will have better management quality which is associated with a higher probability of adopting new technologies. A dummy variable is employed for the manager's education, which equals 1 if the manager possesses a college degree, and 0 if the manager does not have a college degree.

b) Business environment

- **Demand**

In a groundbreaking study on innovation in 1966, economist Jacob Schmookler argues that innovation is primarily fueled by economic demand, individuals innovate when they anticipate greater economic benefits compared to the costs involved. A recent study conducted by Cirera et al in 2021 supports this theory. Surveying 1,500 Vietnamese firms with 5 or more employees, the authors found that 75% of companies do not choose to adopt new technology because they do not recognize the demand from the market. The lack of demand corresponds to uncertainty about the returns on investment in technology. If companies are unsure whether there will be sufficient demand for products or services produced using new technologies, they may be hesitant to invest in adopting those technologies. This uncertainty about future demand can create a barrier to technology adoption as companies weigh the potential risks and benefits of investing in new technologies. However, some economists critique this argument as overly simplistic, especially for neglecting non-economic factors that significantly shape the innovation process (Rosenberg, 1974). Merely having a demand for a new product or service does not guarantee the emergence of innovation.

- **The prospect of monopoly**

The potential for monopoly profits serves as a significant motivation for investment and innovation. Introducing a “new product” provides its creator with a competitive edge over rivals, at least until they replicate the innovation (Morck & Yeung, 2001). As Schumpeter noted, "Every successful corner may spell monopoly for the moment” (Schumpeter, 2013, p.102). When comparing the differences in the incentives for product innovation of monopoly and competitive market, Chen and Schwartz (2013) claim that monopolists could maximize profits by controlling the market and setting prices without direct competition. They have a stable incentive for product innovation as they do not face immediate competitive pressures. However, while the prospect of a temporary monopoly may incentivize innovation, a permanent monopoly can hinder it. Scherer and Ross (1990) suggest that a company that already holds a strong position in its market may lack motivation to speed up the introduction of product improvements.

In the case of access money, it is the combination of recognizing the demand, assuring the monopoly position, and securing larger demand from the market. For instance, construction projects such as building hospitals, transportation projects, or supplying medical equipment are the government's need to upgrade infrastructure, improve citizen's living standards, and respond to urgent cases. These needs for public goods are always present at every stage of each country's economic development process. Based on political relationships and connections with interest groups, companies use access money to win these contracts. In this case, access money is the company's first response when they sense the demands from the market.

One could argue that in many situations, access money is used solely for deepening political connections. This argument is completely valid as building any kind of relationship often requires a sizable amount of time and effort, including materialistic resources. However, it would be acknowledged that firms operate based on profits, they might not be naive to invest in something that will not turn into profits in the future. "Access money" may not bring lucrative benefits right away but promising valuable opportunities in the future.

The second function of access money is to secure a monopoly position in the market. Companies bribe officials with huge amounts of money in exchange for gaining exclusive rights to implement public projects. Normally, to find suitable contractors, government agencies will organize bidding to find suitable candidates that meet product quality at a reasonable price. However, in cases where access money is involved, these tenders are often not held and a "mystery bidder" is selected based on some “unclear criteria”. The author will clarify the argument when analyzing access money and the case of a Vietnamese pharmaceutical company in Vietnam. Therefore, successful access money secures demand (from the government contracts) and creates monopolists in the market of public goods.

In this study, access money represents both demand from the market and the prospect of monopoly at the same time. The variable is measured as a dummy variable, receiving a value of 0 if a company does not pay access money, and receiving a value of 1 if a company pays access money (to gain government contracts).

c) Government policy

- **Government support**

Governmental support could be immensely beneficial to a firm's operation in general and specifically innovative activities. Branstetter and Sakakibara (1998) find that companies that received governmental support in Japan achieved higher productivity and profits. Furthermore, those companies are said to be more successful in accessing external credential sources (Lerner, 2000) and investing more in research and development activities (Aerts & Schmidt, 2008). Government financing or funding for investments can reduce the financial strain and increase spending on innovation (Tuyen & Huong, 2018; Pham & Matsunaga, 2019). This study measures government support including financial assistance, technical assistance, and other types of government assistance, as a dummy variable. Financial assistance comprises investment incentives such as tax exemptions or reductions and loans from state-owned banks. Technical assistance covers human resource training programs, trade promotion programs, and programs supporting implementing quality assurance. If the company received one of the above government assistance in the previous year, the value of the variable is 1. If the company did not receive support from the government, the value of the variable is 0.

2.4 Review of theoretical models

There is limited research on the theoretical links between corruption and innovation, ending with inconclusive results. A significant related body of research examines the relationship between corruption and economic growth in general and firms' performance specifically (Ades & Tella, 1997; Aidt, 2003; Fisman & Svensson, 2007). However, the results from these studies paint a rather complex and asymmetrical picture. The impacts of corruption vary across firms of different sizes in different economies due to existing differences in social and economic conditions. The influences of corruption on the economy as a whole and firm level are categorized into "helping hand" and "grabbing hand" in which institutional quality is the decisive factor.

2.4.1 “Helping hand theory” or “Grease the wheels theory”

Most of the discussion supporting the “helping hand theory” implies *that corruption facilitates and greases the economic wheels by lubricating and eliminating obstacles from red tape*. In this case, corruption is considered as speed money speeding up the delayed culture and cumbersome administration.

This school of thought refers to the idea that corruption helps firms to survive and promote their efficiency in a low-quality institutional environment (Bjorvatn & Søreide, 2005). Sharing this idea, Huntington (1968) and Méon and Weill (2010) point out that corruption plays the role of a “lubricant” facilitating a firm’s activities when companies face obstacles and harassment from a weak judicial system and bureaucracy. In ill-functioning institutions, businesses often face cumbersome procedures and bureaucratic officials directly reducing their resources and discouraging future investment. Bribery and political relationships, to some extent, could mitigate the instabilities and unexpected alterations in the business environment (Murphy et al.,1993). Corruption could be considered as "insurance" purchased by businessmen to prevent unexpected changes in laws and policies, causing disturbances to their business plans.

Additionally, bribery appears to counter administrative ineffectiveness, excessive red tape, and inflexible regulations, which inhibit productive, creative initiatives (Golla, 2010). Samuel P. Huntington (1968, p. 386) frankly states that “the only thing worse than a society with a rigid, over-centralized, dishonest bureaucracy is one with a rigid, over-centralized, honest bureaucracy”. Corruption in a rigid system could speed up administrative procedures and reduce the delayed habit of public officials (Leys, 1965; Lui, 1985). Corrupt officials will work harder to serve the businesses they have received bribes from. In this case, corruption and bribery significantly maximize economic growth since it has improved a firm’s efficiency and productivity (Méndez & Sepulveda, 2006). If the business has to bargain with a dishonest official, corruption could decide which business is better at cost management. The theory assumes that to obtain state contracts, companies must compete to offer the highest bribery. Therefore, only the company with the lowest cost could afford this enormous fee (Beck & Maher, 1986; Lien, 1986).

Wedeman (2003) uses the term the “East Asian paradox” to describe impressive economic growth in environments where corruption is widespread such as China, Korea, or Thailand. These countries refer to massive organized corruption networks where corrupt behavior is a system norm. When corruption appears to be “a culture” firmly established, unpredictability is reduced, and investment may expand because bribery is just the fee to join the game (Anh, Minh & Tran-Nam, 2016).

2.4.2 “Grabbing hand theory” or “Sand the wheels theory”

The opponent of the “helping hand” is the “grabbing hand” or “sand the wheels” theory. This school of thought argues *that corruption surges enterprises' setting up and operating costs, daunting investors and thus impeding economic growth* (Bliss & Tella, 1997; Aidt, 2003). Additionally, instead of speeding up administrative procedures, bribery also creates a habit of corrupting government officials (Myrdal, 1968). Authorities will take advantage of every opportunity to make money from the business, providing public services as their duty becomes a privilege they bestow upon the enterprises (Tanzi, 1998).

To the companies, corruption undermines essential resources such as corporate culture, distorts the allocation of resources, and destroys incentives for investment in research and innovation (Murphy, Shleifer & Vishny, 1993; Hung, 2008; Lou, 2005). Corruption fundamentally escalates the uncertainty and cost of transactions related to intellectual property rights because the innovators' value chain must contact connected officials and authorities at some step of their invention process. Corruption also raises the cost of licenses, approvals, and other services provided by the government, which innovators frequently demand (Murphy et al., 1991). For instance, corrupt officials in state licensing agencies may demand bribes for issuing patents or quality certificates (Paunov, 2016). To make matters worse, contestants who copy the inventors' ideas can escape punishment if the corrupt-prone judge accepts bribes from the violators (Xu & Yano, 2017).

Expropriation by corrupted authorities always reduces the expected profits from innovative activities, making a potentially lucrative product challenging to sell profitably (Xu & Yano, 2017). Due to its unjust and exploitative nature, corporations

find it challenging and expensive to implement anti-corruption measures (Luo, 2005). In this way, corruption discourages enterprises from investing in and developing new production technologies, indirectly delaying the development of the economy.

Additionally, bribery is also prone to discourage the innovative efforts of smaller businesses (Paunov, 2016). Larger companies with higher sales revenue have fewer credit constraints than small companies and can thus spend more on bribery (Svensson, 2005). Furthermore, big businesses may be preferred partners for bribe-prone politicians since they could earn more from bribery than smaller companies. Bribe-prone officials may negotiate with large corporations and establish long-term relationships (with recurrent interactions) rather than smaller businesses.

The two schools of thought suggest that the correlations between corruption and firms' performance in general, and firms' innovation particularly are complicated and highly context-dependent, with the impact depending on which "hand" is dominant.

2.5 Review of empirical evidence

The surge in empirical research investigating the correlation between corruption and innovation has been significant in recent decades, partly because of the increase in available data. This research topic encompasses studies conducted within individual countries as well as cross-country analysis.

Research specific to individual countries often concentrates on developing or transitioning economies (Xie et al., 2019; Xu & Yano, 2017; Anh et al., 2016; Doan et al., 2021). The US appears to be the only exceptional case in this regard (Dincer, 2019). Cross-country research typically focuses on developing countries (evidenced by research from Paunov, 2016; and Pirtea et al., 2019), markets in Africa (as demonstrated by studies from Barasa, 2018; Mahagaonkar, 2009), and countries in Eastern Europe and Central Asia (as indicated by research from Habiyaremye & Raymond, 2018; Kabadurmuş, 2017). However, exceptions include studies examining the OECD's members (Griffiths & Kickul, 2008; Wen et al., 2020), and a combination of developing and developed economies (as evidenced by the work of Heo, Hou & Park, 2021).

The majority of studies that analyze national-level aggregate data suggest that corruption hurts innovation. For instance, Griffiths and Kickul (2008) classified several EU countries, Japan, and the US into different groups based on their innovation index and found a positive correlation between innovation levels and lower perceptions of corruption. Golla (2010) supported this finding in her study focusing on previously centralized EU economies, where she found a link between the Corruption Perceptions Index (CPI) and the Summary Innovation Index (SII).

Similarly, Natário, Couto, Tiago, and Braga (2010) conducted a study aiming to evaluate the hypothesis that institutional efficiency positively influences a country's innovative capability. They utilized data from the European Innovation Scoreboard for 2008 and found a robust relationship between corruption and innovation. Countries with the highest innovative capacity were associated with stringent corruption control, while those with the lowest potential for innovation had weaker corruption control.

Anokhin and Schulze (2009) used panel data spanning 64 countries from 1996 to 2002 to explore the relationship between corruption control and innovation levels. While they found no significant linear influence of corruption control on innovation, they observed a positive squared-term effect, suggesting a convex relationship between corruption control and innovative competence.

Conversely, research at the firm level suggests that corruption can both hinder and promote innovation. A study by de Waldemar (2012) provides compelling evidence for corruption's inhibiting effect on innovation. Using data from the World Bank Enterprise Survey of Indian firms in 2005, which surveyed 2,280 enterprises across 17 states, the study examined product innovation (introduction of new products) and bribery (average bribery practices across sectors and states). Through probit estimation, the study consistently found a negative and statistically significant impact of bribery on product innovation across all specifications.

Another firm-level study by Mahagaonkar (2009) focused on African countries with weak governance institutions and cumbersome regulations, ideal for testing hypotheses regarding corruption's effects. This study categorized innovative activities into marketing, organizational, process, and product innovation, recognizing that corruption

might affect these differently. Using data from the 2004 World Bank Enterprise Survey on African large-scale enterprises, the study found that corruption impedes product and organizational innovation but enhances marketing innovation. Process innovation, however, remains unaffected by corruption, suggesting concurrent effects of both inhibiting and facilitating innovation.

Furthermore, evidence suggests a positive relationship between corruption and innovation, supporting the "greasing the wheels" theory. Krammer (2014) analyzed data from 7,000 firms across 30 emerging markets to explore the impact of corruption, represented by bribes, on firm innovation. Despite variations in bribery practices and innovative performance, the study found that bribes positively influence firm innovation by streamlining regulatory processes and facilitating the introduction of new products to markets.

While the discussion on corruption and innovation is relatively new in literature, the existing evidence indicates a nuanced relationship between the two. This relationship appears to involve potential mutual influence, where corruption can affect innovation and vice versa (Anh et al., 2016). Furthermore, the effect of corruption on innovation seems to vary depending on factors such as the kinds of innovation, the types and the scale of corruption present, and the regional institutional framework.

2.6 Access money and access money in Vietnam

Access money involves the exchange of power and money between the political elite and businessmen based on the profit-sharing model (Ang, 2020). According to Ang (2020), access money is regarded as an investment, a business opportunity rather than a tax burden. These investments are used to cultivate the relationship with the elites for future privileges or to seize the current lucrative profits by winning government contracts or preferential loans. Ang (2020) analyzes the corruption cases including access money and argues that when the capitalists bribe politicians with massive gifts, they could get exclusive access to government construction contracts, low-interest credit, or manufacturing projects in exchange. Preferential credit noticeably boosts a company’s capital resources facilitating investment and, in a way, mitigating risk aversion indirectly encouraging research and adopting new technologies. By winning

important government contracts, companies have the motivation to invest in manufacturing plants, upgrade production lines by applying new technologies, buy new machinery, hire new employees, or improve their current products to meet the requirements and complete the contracts with the government. Profits gained from these contracts can be an excellent source of finance to expand the company and encourage future investment.

In her book "China's Gilded Age: The Paradox of Economic Boom and Vast Corruption", Ang refers access money as "the steroid" of capitalism. In medicine, steroids could promote muscle growth. However, it should be noted that steroid use must be prescribed and supervised by a doctor. Overdosing on steroids can lead to serious side effects such as hormone disruption or damage to important internal organs such as the heart, liver, and kidneys. Like steroids, access money promotes short-term investment and growth but can lead to distorted allocation of national resources and undermine the principles of perfectly competitive markets. Companies will rely on political connections and access money to secure projects, thus creating monopolies. These monopolies can discourage new businesses from entering the market and cause losses to the state budget when they engage in price inflation. Therefore, access money may boost investment in the short term, but will create distortions in the long term. Monopoly does not create healthy competition and gradually eliminates innovation and investment incentives in the long run (Ang, 2020).

To some extent, the operation mechanism of access money has many similarities with crony capitalism or one could argue access money is a representative of cronyism. Crony capitalism was famously defined in The Economist as an economic system in which capitalists could gain enormous rents thanks to close relationships with political authorities (Pei, 2016). Corruption and cronyism often go together, implying that this is a reciprocal relationship based on shared interests (Khatri & Ojha, 2016; Pei, 2016; Haber, 2013). Haber (2013) studies the case of crony capitalism in Latin America and claims that crony capitalism creates huge inequality in distributing income. In an apolitical system where cronyism is widespread, business groups benefiting from political privilege have higher chances of obtaining rents, and that motivates them to invest. These attractive rents must come from somewhere: probably every member of

the community. Political connections ensure that these companies would enjoy their monopoly positions in the market for a certain good. This often results in prices that are much higher than in cases where companies are free to participate in the competition. Consumers are the ones who suffer the most since they do not have their own choices. The accumulated wealth of a small group of people comes at the expense of the loss of the entire society.

Considering access money in Vietnam: the case study of Viet A test kit

In the context of Vietnam today, crony capitalism has penetrated deeply into political and economic life for quite a long time. Most businesses in Vietnam understand that building relationships with officials is very important to be able to do business smoothly. Many businesses consider this a necessity and an effective way to invest in future development (Nguyen, Nguyen, Hoang & Ho, 2017). Crony capitalism has seriously damaged the business environment in Vietnam. Businesses have reported encountering substantial obstacles when attempting to enter unfamiliar markets, particularly in cases where they lack political affiliations or connections with interest groups (Vu, 2015). Such businesses will find it difficult to get contracts and projects, business costs will always increase, and sooner or later they will go bankrupt. Meanwhile, businesses from "interest groups" take advantage of opportunities thanks to priority and incentives in accessing the country's resources including land, resources, access to contracts, and commercial rights (Nguyen, Nguyen, Hoang & Ho, 2017).

2023 marked one of the milestones in the history of the Vietnam Communist Party as it dealt with one of the biggest corruption scandals in the Vietnamese political landscape (Giang, 2023). The whole society was shaken up by several trials involving hundreds of businessmen and public officials from all levels of the bureaucracy. The distribution of overpriced COVID-19 test kits cases was among them. It can be said that the Viet A case is one of the typical examples of the exchange of benefits between officials and businessmen to profit from state resources. In early 2020, when the COVID-19 epidemic broke out, the Vietnamese government had a policy of assigning scientific institutes to proactively research and produce biological products to prevent the spread of the disease. To easily "squeeze" into the research team, get accepted, and

be licensed to circulate, and distribute test kits, the Director of Viet A – a pharmaceutical company Phan Quoc Viet spent more than 106 billion VND (equivalent to about $4 million) bribing public officials (Nguyen, 2024). The Director of Viet A also spent tens of billions of VND to thank some officials who made illegal decisions that benefit the company. After receiving huge bribes, some senior leaders of the Ministry of Health even introduced Viet A to local leaders to help this company sell test kits. To be able to sell and distribute more test kits, the director of this company heavily paid bribes and high commission percentages to the Directors of the Centers for Disease Control and Prevention in different provinces in Vietnam. For a long time, Viet A has surpassed many competitors and became the exclusive distributor of test kits in many provinces of Vietnam (Nguyen, 2024). The selling price of these test kits is said to be many times higher than the production cost, creating a huge profit of up to trillions of VND for this company (Anh, 2024). A question asked by many experts and authorities is whether this company actually produced the test kits. The conclusion of the investigation from the company's factory shows that the company did produce this medical tool, and it also passed many quality inspections conducted by the Ministry of Health.

In these cases, access money represents both the "Grease the wheels" and "Sand the wheels" theories. "Access money" gives the companies "access" to business opportunities, opening chances of investing in new technologies and fostering technological transfers. After winning the project, the company invests noticeably in technology and production lines to meet the needs of the customers – the government agencies. Investment, innovation, and technological adoption happen, but the healthy competition in the market is also eliminated at the same time. These innovations might not be sustainable in the long run because they have created a monopoly. When a company is the only producer, the only supplier in the market, there is probably no need for further improvements because they can still sell their products at any price. Access money greases "the innovative wheel" temporarily, but becomes "sand in the innovative wheel" in the end.

CHAPTER 3: METHODOLOGY AND DATA

3.1 Analytical framework

Data is gathered and examined utilizing the framework illustrated in Figure 3 below. This framework integrates three components comprising six elements relevant to both the analytical framework and the research inquiries: the age and size of a firm, its export activities, access money, the management quality (measured by the education level of the manager), and government support representing governmental policies. As mentioned earlier, in this study, access money corresponds to both market demand and the potential of being a monopoly.

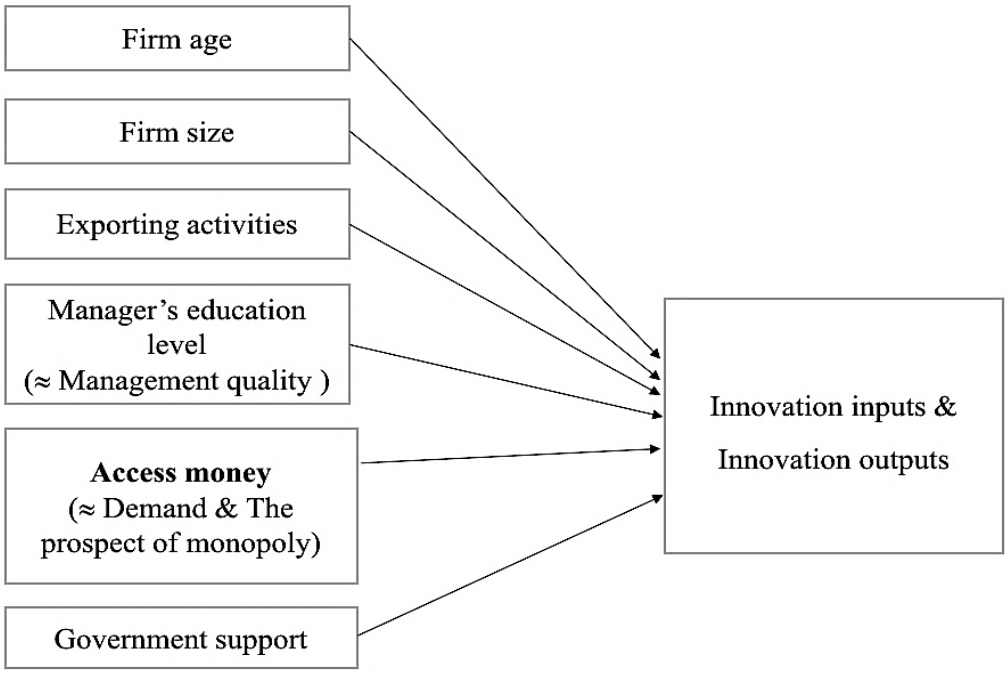

Figure 3: Analytical framework prepared by the author

3.2 Research method

Employing a mixed methods approach is often regarded as suitable for delving into the multifaceted aspects of research topics in social sciences. This approach can effectively capture diverse dimensions of the subject matter, surpassing the limitations of relying solely on quantitative or qualitative methods (Cresswell, 2013). According to Cresswell (2013), the combination of these two methods can provide a more comprehensive and in-depth view of the research problem.

3.2.1. Qualitative method

Corruption is a complex and ever-changing phenomenon, exhibiting numerous manifestations and involving various actors. Its clandestine and highly collusive nature frequently hampers thorough investigations into its scope and characteristics (UNODC, 2018). Therefore, in this study, instead of doing in-depth interviews, the author deploys a thematic analysis technique to investigate the effects and operating mechanism of corruption on investment and innovation in Vietnam by analyzing corruption cases. Thematic analysis involves identifying patterns or themes within qualitative data (Maguire & Delahunt, 2017). The thematic analysis aims to recognize themes or patterns in the data that are significant or noteworthy and utilize these themes to explore the research question or shed light on an issue. It goes beyond mere data summarization; a robust thematic analysis involves interpretation and making sense of the data (Maguire & Delahunt, 2017).

3.2.2. Quantitative method

The quantitative method is employed to analyze a secondary data source collected by two Vietnamese reputable research institutes namely The Institute of Labor Sciences and Social Affairs (ILSSA) and The Central Institute for Economic Management (CIEM). A regression model is utilized to quantify the correlation between corruption (represented by access money) and innovation activities at the firm's level. The results from the regression model could empirically evaluate the level of impact of corruption on innovation.

a) Variables

The study deploys two Probit models with two separated dependent variables (InnovationInput and InnovationOutput), one independent variable (AccessMoney), and five control variables (FirmSize, FirmAge, GovernmentSupport, Export, and ManagerDegree). The descriptions of variables are presented in Table 1.

Table 1: Variables_ Definition and Measurement

Variables	Description and Measurement
Dependent variables	
InnovationOutput	The variable takes the value of 1 if a company has introduced new products, new technology, or any improvements to the current products in the last 2 years. The value takes the value of 0 if a company has not implemented any of those above in the last 2 years.
InnovationInput	The variable indicates innovation input receives the value of 1 if a company has invested in equipment or machinery, invested in R&D, or purchased patents in the last 2 years. The value takes the value of 0 if a company has not invested in equipment or machinery, investing in R&D, or patents in the last 2 years.
Independent variables	
AccessMoney	The variable is measured as a dummy variable, receiving a value of 0 if a company did not pay access money in the previous year, and receiving a value of 1 if a company paid access money in the previous year.
Control variables	
FirmSize	In measuring firm size, the analysis employs the total assets of a company at the end of the previous year.
FirmAge	The firm's age is measured by years of operation of the company.
Export	The variable takes the value of 1 if a company participated in either direct or indirect exporting in the previous year. The

	variable receives a value of 0 if a company was not involved in any direct or indirect exporting activities in the previous year.
ManagerDegree	The education level of the manager is used as the proximity for the management quality. A dummy variable is employed for the manager's education, which equals 1 if the manager possesses a college degree, and 0 if the manager does not have a college degree.
GovernmentSupport	This study measures government support including financial assistance, technical assistance, and other types of government assistance, as a dummy variable. If the company received one of the government assistance in the previous year, the value of the variable is 1. If the company did not receive support from the government, the value of the variable is 0.

b) Models and hypothesis

Following the Oslo Manual guidelines (2005) for gathering and interpreting innovation data, the author evaluates a company's innovative activities by analyzing its investment in R&D initiatives, and its capacity to introduce new products, adopt new production methods, or refine existing products within the last two years. Consequently, this study explores various categories of firm innovation, encompassing: (i) product innovation, which assesses whether a company introduces new goods; (ii) process innovation, which evaluates whether a company adopts innovative production processes; (iii) product improvement, which examines whether a company enhances existing products; and (iv) innovation inputs, which scrutinize whether a company invests in R&D activities, equipment and machinery or patents.

The binary nature of the dependent variable makes the OLS method unsuitable for estimating the impact of corruption on firm innovation (Wooldridge, 2013). Therefore, following previous studies (de Waldemar, 2012; Goedhuys, 2007; Lederman, 2010), the probit regression is used to model innovation (the dummy-dependent variable). In a

panel dataset, estimating fixed effects in a linear probability model with unobserved effects is feasible. However, interpreting and estimating fixed effects in nonlinear probability models like logit or probit models is challenging (Wooldridge, 2013). Additionally, the estimators for fixed effects in probit models may lack consistency (Lee, 2016). Hence, for this study, the random effects probit model is chosen.

The models for testing the hypotheses are outlined as follows:

Hypothesis 1: Firms that pay access money are more likely to invest in innovation inputs than companies that do not pay access money. In other words, firms paying access money have a higher possibility to invest in R&D activities, equipment, machinery, and patents.

$$\text{InnovationInput}_{it} = \beta_0 + \beta_1\text{AccessMoney}_{i(t-1)} + \beta_2\text{FirmAge}_{it} + \beta_3\text{FirmSize}_{it} + \beta_4\text{GovernmentSupport}_{i(t-1)} + \beta_5\text{Export}_{i(t-1)} + \beta_6\text{ManagerDegree}_i + \mu_{it}$$

$InnovationInput_{it}$ is the dependent variable representing the investment in innovative activities in company *i* at year *t* (measured by whether company i has invested in innovation inputs in the last 2 years), $AccessMoney_{i(t-1)}$ indicates whether company *i* pays access money in the year *t-1* or not, $FirmAge_{it}$ is the number of years operation of the company *i* at year *t*, $FirmSize_{it}$ is the total assets of firm *i* at the end of year *t-1*, $GovernmentSupport_{i(t-1)}$ indicates whether company *i* received government assistance in the previous year, $Export_{i(t-1)}$ shows whether company *i* involved in any direct or indirect exporting activities in year *t-1*, $ManagerDegree_i$ indicates whether the manager of the company *i* owns a college degree or not, μ_{it} is a random error term.

Hypothesis 2: Firms that pay access money have a higher possibility of implementing innovative activities namely introducing new product lines, introducing new technology or production processes, and improving current products.

$$\text{InnovationOutput}_{it} = \beta_0 + \beta_1\text{AccessMoney}_{i(t-1)} + \beta_2\text{FirmAge}_{it} + \beta_3\text{FirmSize}_{it} + \beta_4\text{GovernmentSupport}_{i(t-1)} + \beta_5\text{Export}_{i(t-1)} + \beta_6\text{ManagerDegree}_i + \mu_{it}$$

$InnovationOutput_{it}$ is the dependent variable and represents the implementation of innovative activities at year *t* (measured by whether company *i* has implemented any

innovative activities in the last 2 years), $AccessMoney_{i(t-1)}$ indicates whether company *i* pays access money in the year *t-1* or not, $FirmAge_{it}$ is the number of years operation of the company *i* at year *t*, $FirmSize_{it}$ is the total assets of firm *i* at the end of year *t-1*, $GovernmentSupport_{i(t-1)}$ indicates whether company *i* received government assistance in the previous year, $Export_{i(t-1)}$ shows whether company *i* involved in any direct or indirect exporting activities in year *t-1*, $ManagerDegree_i$ indicates whether the manager of the company *i* owns a college degree or not, μ_{it} is a random error term.

3.3. Data collection

The research utilizes a secondary data source gathered from surveys conducted among SMEs in Vietnam. These surveys were carried out through collaboration between two prominent Vietnamese institutions: The Central Institute for Economic Management (CIEM) and the Institute of Labor Sciences and Social Affairs (ILSSA). Focusing specifically on manufacturing SMEs, the surveys were undertaken biennially spanning from 2005 to 2015. The geographical scope of the surveys encompasses 10 provinces (Ho Chi Minh City, Hanoi, Hai Phong, Long An, Ha Tay, Quang Nam, Phu Tho, Nghe An, Khanh Hoa, Lam Dong) across three distinct regions (South, Central, North) of Vietnam.

The data set now is available freely on the website of the United Nations University. Using this dataset provides several benefits as it encompasses a wide array of information regarding various business aspects of the surveyed small and medium-sized enterprises, including their characteristics, production activities, and the different types of innovation they have accomplished. Additionally, it includes extensive monetary details regarding bribe payments, covering areas like accessing public services, obtaining licenses and permits, managing taxes and tax collection, securing government contracts and public procurement, as well as handling customs, imports, and exports. This data set has been used in a series of previous studies on Small and Medium Enterprises in Vietnam (Nguyen et al., 2008; Tuyến & Hưởng, 2018; Anh et al., 2016; Doan et al., 2021; Trang & Matsunaga, 2019; Rand & Tarp, 2020). The author specifically focuses on "access money" payments within this dataset. However, due to data limitations and variations across different years, the author restricts the analysis to

the period between 2011 and 2015. Consequently, the dataset comprises a total of 7702 SMEs for analysis following data extraction.

Data used for thematic analysis of corruption cases mainly comes from press pages from state-owned media agencies. This information is said to be confirmed by various officials of the Communist Party and the Vietnamese government.

CHAPTER 4: RESULTS

4.1. Overview of the Status of SME Innovation and Corruption in Vietnam

4.1.1. State of Innovation in Vietnamese SMEs from 2011 to 2015

a) Innovation input

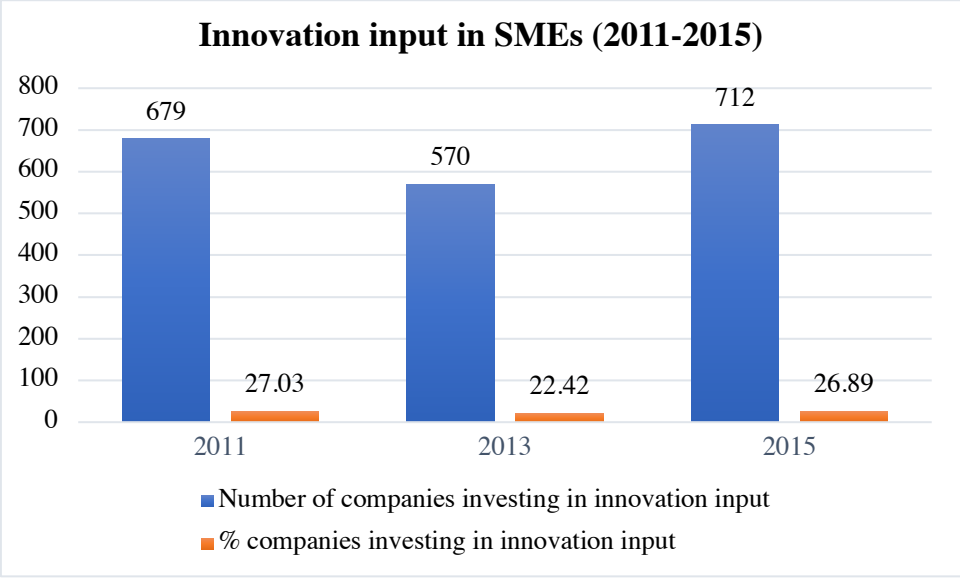

Figure 4: Number and the proportion of SMEs investing in Innovation input (2011- 2015)

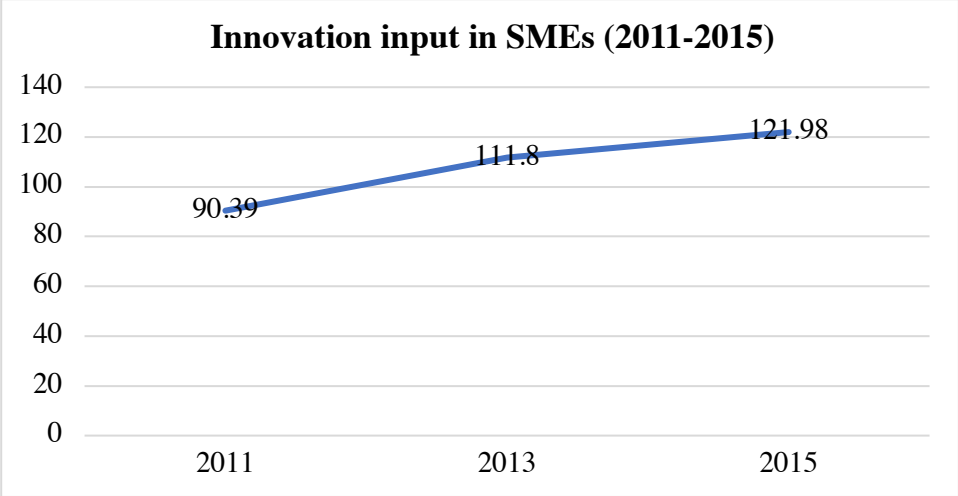

Figure 5: Average amount of investment in Innovation input in SMEs (2011-2015) (million VND)

Regarding innovation input, Figure 5 shows that the number of SMEs investing in innovation was relatively humble as mentioned in a recent report from the World Bank

(World Bank, 2023). Only about 30% of the total number of surveyed businesses invested in innovation activities. This statistic underscores a notable lack of emphasis on innovation initiatives, and this situation has been happening for many years.

Although the investment in Innovation Inputs significantly improved from 2011, only less than 1% of companies participating in the survey conduct R&D activities, suggesting that the majority of innovation is not supported by research and development activities (Thanh, 2021).

b) Innovation Output

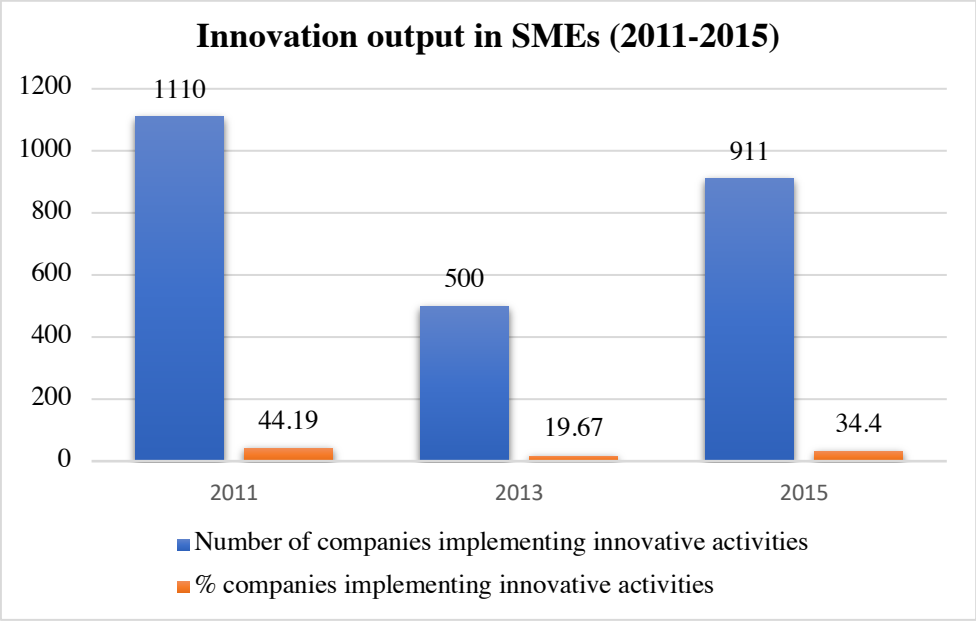

Figure 6: Number and the proportion of SMEs implementing Innovative activities (2011-2015)

Regarding implementing innovation activities, this figure witnessed a noticeable fluctuation during the surveyed time. 2013 was recorded as the year with the highest percentage of businesses implementing innovation activities (about 45%). However, this number dropped sharply to only about 20% in 2013 before increasing again in 2015 to about 35%. These figures indicate that SMEs did not place significant emphasis on investment endeavors and the integration of innovative practices into their production processes.

4.1.2. State of Corruption in Vietnamese SMEs from 2011 to 2015

a) Bribe frequency

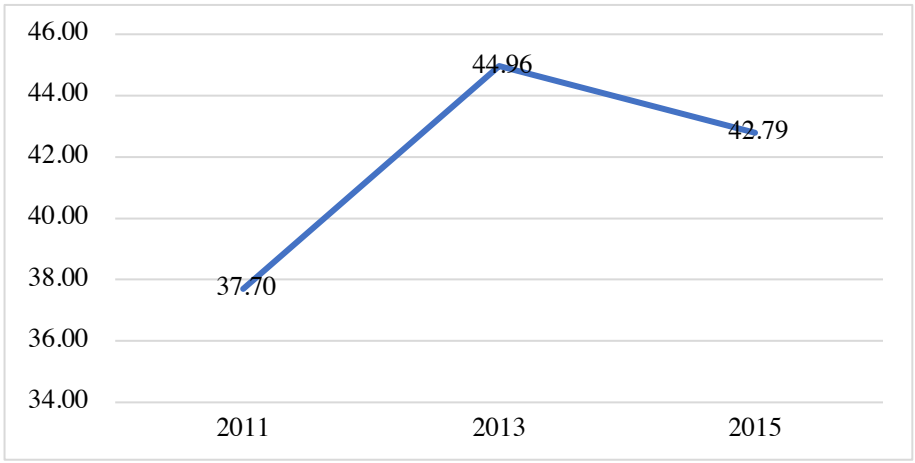

Figure 7: The proportion of SMEs paying bribes during the surveyed time (%)

The graph revealed that a substantial proportion, approximately thirty to fifty percent, of the enterprises within the dataset were implicated in acts of bribery. Moreover, the practice of offering bribes to governmental authorities was not an isolated occurrence but rather manifested recurrently, with the majority of cases ranging from 2 to 5 instances annually across the surveyed enterprises. These figures underscore the pervasive nature of corruption within the Vietnamese business landscape, highlighting it as a prevalent and concerning issue.

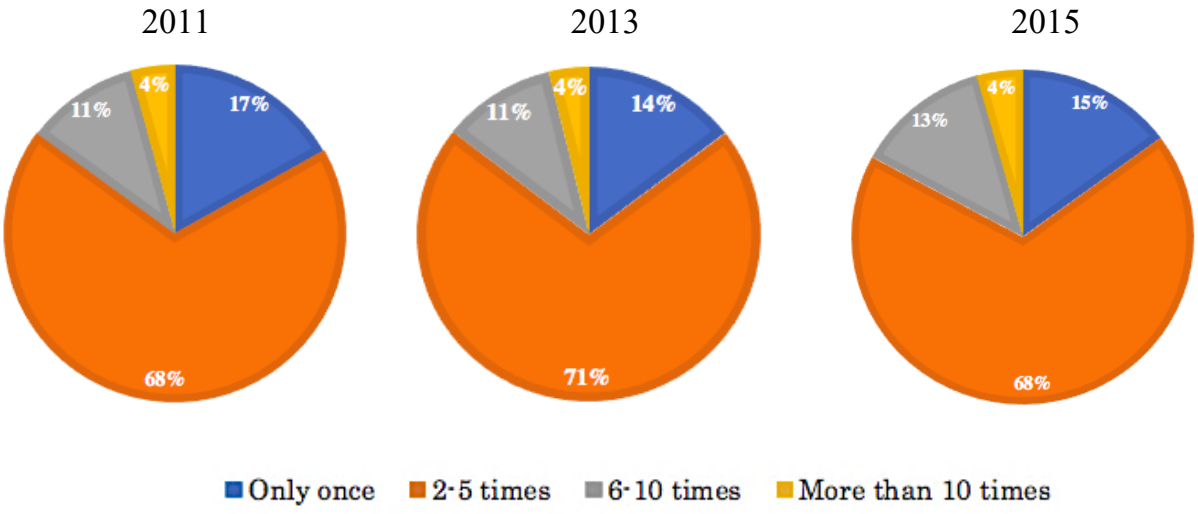

Figure 8: The frequency of paying bribery among surveyed companies (2011-2015)

b) Bribe purpose

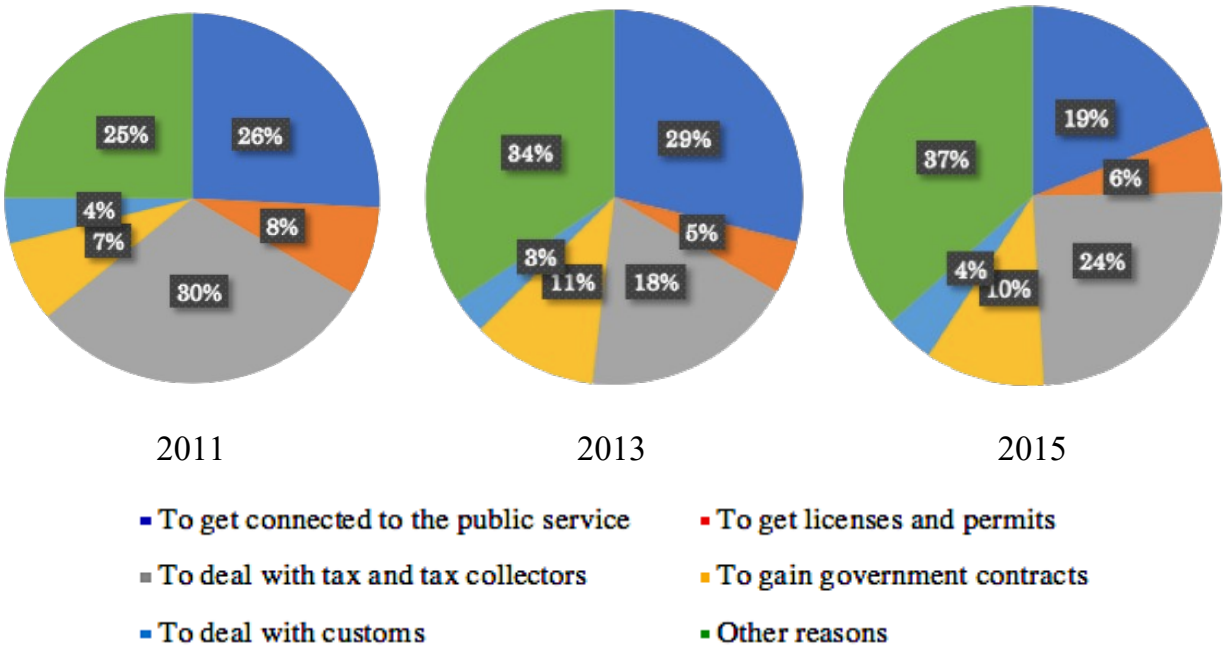

Figure 9: The purpose of paying bribery

The primary motivations driving bribery among enterprises were identified as gaining access to public services and dealing with taxation processes. Specifically, the analysis indicated that SMEs predominantly resort to bribery as a means to streamline arduous administrative procedures and address regulatory tax requirements. In contrast, a relatively minor portion, approximately 10% of businesses, engaged in bribery to secure government contracts. This observation suggests that such payments were optional rather than obligatory, with the implication that a significant portion of enterprises may lack the financial means to pursue this avenue.

4.2. Empirical results from random effects probit regression models

4.2.1. Descriptive statistics

a) Summary statistics of the variables

In this section of the paper, the author employed descriptive analysis to demonstrate the data set. Table 2 presents a statistical overview of the variables utilized in the model, encompassing the number of observations, mean, standard deviation, minimum value, and maximum value of each variable.

Table 2: Summary statistics (author's calculation)

Dependent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Innovative activities					
InnovationInput	7,702	.255	.436	0	1
InnovationOutput	7,702	.327	.469	0	1

Independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Firm's characteristics					
FirmAge (years)	7,696	15.204	9.969	2	76
FirmSize (million VND)	7,608	5271.32	21884.22	.1472	921004.8
Export	7,684	.064	.245	0	1
ManagerDegree	7,179	.1301	.3364	0	1
Business environment					
AccessMoney	7,702	.0397	.195	0	1
Government Policy					
GovernmentSupport	7,699	.1137	.317	0	1

The majority of firms are relatively young, with an average age of approximately 15 years. Involvement in exporting activities remains limited, with only 6.4% of firms engaging in export activities in the preceding year. In the meantime, government assistance to these firms has a low record, as only 11% receive such support. A majority of the firm's owners do not possess a college degree. Only 13% of firms have managers attaining higher education.

Regarding investment in innovation input, this figure from SMEs was relatively humble as mentioned in a recent report from the World Bank (World Bank, 2023). Only about 26% of the total number of surveyed businesses invested in innovation activities. This statistic underscores a notable lack of emphasis on innovation initiatives, and this situation has been happening for many years.

Concerning implementing innovation activities, this figure witnessed a slight improvement compared to innovation input during the surveyed time. Around a third of the surveyed companies carried out innovative activities. These figures indicate that SMEs did not place significant emphasis on investment endeavors and the integration of innovative practices into their production processes.

4.2.2. Correlation Matrix

Table 3: Correlation testing (author's calculation)

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) InnovationInput	1.000							
(2) InnovationOutput	0.180***	1.000						
(3) FirmAge	-0.056***	-0.052***	1.000					
(4) FirmSize	0.092***	0.081***	-0.024**	1.000				
(5) Export	0.068***	0.101***	-0.044***	0.177***	1.000			
(6) AccessMoney	0.025**	0.034***	-0.021*	0.061***	0.026**	1.000		
(7) GovernmentSupp~t	0.072***	0.098***	-0.030***	0.030***	0.095***	0.040***	1.000	
(8) ManagerDegree	0.057***	0.089***	-0.136***	0.150***	0.140***	0.018	0.049***	1.000

**** p<0.01, ** p<0.05, * p<0.1*

Table 3 displays the correlations between variables. This analysis aims to understand the degree of correlation between these variables; the closer the correlation coefficient is to 1, the stronger the correlation. There are no significant correlations detected among the explanatory variables.

4.2.3. Factors affecting Innovation input

The empirical findings derived from random effects probit regression models are presented in Table 4, and Table 5 presents the average marginal effects.

Table 4: Impacts of access money on the firm's innovative activities

Variables	InnovationInput	InnovationOutput
	(1)	(2)
AccessMoney	0.124	0.239***
	(0.0985)	(0.0834)
FirmSize	7.17e-06***	5.21e-06***
	(1.41e-06)	(1.19e-06)
FirmAge	-0.00875***	-0.00532***
	(0.00212)	(0.00163)
Export	0.202**	0.329***
	(0.0848)	(0.0688)
GovernmentSupport	0.275***	0.316***
	(0.0565)	(0.0486)
ManagerDegree	0.129**	0.237***
	(0.0556)	(0.0473)
Observations	7,079	7,079

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Average marginal effects of independent variables on innovation

Variables	InnovationInput (1)	InnovationOutput (2)
	dy/dx	dy/dx
AccessMoney	0.0356	0.0836***
	(0.0284)	(0.0291)
FirmSize	2.07e-06***	1.82e-06***
	(4.03e-07)	(4.15e-07)
FirmAge	-0.00252***	-0.00186***
	(0.0006)	(0.00057)
Export	0.058**	0.1151***

	(0.024)	(0.0239)
GovernmentSupport	0.0793***	0.1105***
	(0.0162)	(0.0168)
ManagerDegree	0.0371**	0.083***
	(0.016)	(0.0164)
Observations	7,079	7,079

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

a) Firm's characteristics

Firm size

Firm size – measured by the total asset - is found to enhance innovation input. Although its impact on innovation input is positive and statistically meaningful, the influential degree of firm size on a firm's innovation input is rather trivial. It is predicted that a 1 unit increase in firm size increases 2.07e-04% in the probability that a company will invest in innovation input. This result shows that larger-sized enterprises are more likely to invest in innovation than smaller-sized enterprises. However, this advantage is relatively insignificant. Since the average total assets of firms in this survey are about 5 billion VND (equivalent to $200000), it is understandable that investment in innovation activities remains a daunting challenge for most of them.

Firm age

Regarding firm age, it has a negative impact on the firm's innovation input. Although the impact of a firm's age on innovation input is trivial, the finding supports the theory of obsolescence effects. Older firms are likely to hesitate to invest in innovative activities. By contrast, younger firms seem to have a more positive attitude towards investing in innovation. It is predicted that if the age of the company increases by 1 year, the possibility that a company invests in innovation reduces by 0.25%.

Exporting activities

The result of this study supports the "learning-by-exporting" theory. Export activities are found to have a profoundly positive influence on investment in innovation activities

within a firm. An exporting company is 5.8% more likely to invest in innovation compared to a company without exported products.

Management quality

Consistent with empirical evidence from previous studies (Cirera, 2021; Crowley & Bourke, 2018; Queiró, 2016), management quality or the education level of managers is realized to play a significant role in promoting technology adoption. The coefficient of a manager's degree indicates that having a manager with a degree raises the likelihood of a firm's investment in innovation by 3.71%.

b) Business environment

Access money

Contrary to the "grease-the-wheel" theory, no significant impact of access money on a firm's innovation input could be confirmed by the analysis.

The result from the regression paints a possibility that the decision to invest in innovation might be more strongly influenced by internal factors of the firm rather than the demand and the prospect of monopoly from the business environment. While the average total asset of SMEs in this sample size is only about $200,000, even when they are able to recognize the needs of the market, mobilizing resources to meet those needs remains difficult, especially when it comes to investing in new technologies. Given the fact that most of SMEs lack collateral and transparent financial data, securing loans for investment in innovation activities encounters numerous challenges (Lan, 2023).

Additionally, applying new technologies or new production lines not only requires significant financial packages but also mastering technological know-how and expert knowledge. It could not be a short-term investment but a long-term development strategy in human resources and production facilities. However, the chance of a small or medium-sized enterprise to develop mass production and monopolize a commodity market in the future is a very unlikely possibility, if not impossible since most of them have to deal with limited resources and fierce competition from bigger enterprises.

Therefore, even when they can pay access money to obtain government contracts, they probably will prioritize choosing projects that do not require much investment in innovative technologies.

c) Government policy

Government support

Financial and technological assistance from the government has proved to have positive impacts on innovative performance. This result is consistent with previous studies showing that financial and technical support tends to stimulate R&D activities (Zúñiga-Vicente et al., 2014). If a company receives assistance from the government, the company is 7.93% more likely to invest in innovation. This suggests that the government plays an important role in encouraging innovation by implementing policies such as interest rate subsidies, supporting human resource training, and the application of new technology.

4.2.3. Factors affecting Innovation output

a) Firm's characteristics

Firm size

Similar to the effect of investment in innovation activities, the size of the firm is found to have no substantial influence on the firm's conduct of innovation activities. It is predicted that 1 unit increase in firm size only leads to 1.82e-04% increase in the firm's innovation outputs. Although this is a statistically significant variable, the degree of its effect is not noticeable.

Firm age

The age of a firm is likely to impede the implementation of innovation outputs. If the age of the firm increases by 1 year, the likelihood that that company carries out innovative activities decreases by 0.19%. Older firms tend to be more hesitant about introducing innovation in their production lines.

Exporting activities

Exporting activities continue to play a noticeably important role in promoting innovative practices in businesses. Companies exporting their products to foreign markets are 11.51% more likely to perform innovative activities. This finding suggests that selling products abroad is critical to a firm's innovation. Being able to export a product to another market means that companies not only face stronger competitors but also need to be more adaptable in meeting the diverse demands of the customers. Innovation activities in exporting businesses need to be invested systematically. Applying new changes or simply improving your current products is not enough. Companies also have to invest their resources in carrying out R&D activities and learning new technologies. Therefore, exporting activities not only enhance innovation inputs but also innovation outputs.

Management quality

Similar to the impact to Innovation Inputs, management quality is proven to have a positive and significant influence on Innovation Outputs. Companies whose managers possess college degrees are about 8.3% more likely to carry out innovation activities. Higher education managers tend to focus on and foster innovative activities more than their lower-level education peers.

b) Business environment

Access money

The result from the probit model indicates that access money has a positive and significant impact on Innovation outputs. Companies paying access money to guarantee government contracts are about 8.36% more likely to implement innovative activities compared to companies that do not pay access money. The finding supports the "Grease the wheel" theory, which has found support in earlier research (Anh et al., 2016; Xie et al., 2019), hypothesizing that corruption could facilitate innovation activities at the firm level. This finding is not improbable, especially in the setting of an emerging economy in which crony capitalism is pervasive, and interest groups appear in every corner of the economy.

Given the prevalence of access money in Vietnam, it's reasonable to assume that Vietnamese SMEs may perceive paying access money as a customary aspect of conducting business. Consequently, they might be inclined to participate in paying access money as long as the advantages, such as greater demand in the future, outweigh the associated costs, namely the amount of bribery. In this context, paying bribes can be interpreted as a method to secure demand from the market, and facilitate new business prospects including innovation. Economically, access money payment could be regarded as an investment promising lucrative profit from public projects.

c) Government policy

Government support continues to play an extremely important role in stimulating the firm's innovative activities. Companies that receive financial and technical assistance from the government are about 11.05% to carry out innovative initiatives. Given the fact that small and medium-sized companies often face various internal and external constraints, any external support is extremely necessary because it can boost business confidence and reduce risk aversion to innovation.

CHAPTER 5: DISCUSSIONS AND PRACTICAL IMPLICATIONS

5.1. Discussions

One possible explanation behind the findings access money seems to promote innovation stems from the concept of potential monopolization. In environments where corruption is widespread, companies might resort to bribery as a means to access resources or opportunities that would otherwise be difficult to obtain. As discussed in Chapter 2, access money operates differently from speed money. While speed money is typically utilized to navigate bureaucratic hurdles or expedite the issuance of licenses for new products, access money fuels the creation of these products. With generous bribery, businesses can secure government projects without undergoing rigorous bidding processes. These lucrative contracts can further strengthen existing interest groups or establish new connections, enhancing the likelihood of securing future public projects. Access money represents a strategic, long-term investment rather than a mere additional cost in the business cycle. In certain instances, the allure of monopolizing government contracts may outweigh the appeal of competitive markets due to the stability of demand they offer. Any investment in launching a new product involves a certain degree of risk. However, when a firm can secure a contract from the government, the possibility that the customer says no to their products is extraordinarily low, if not impossible, especially in the case that the company has powerful political backing.

Securing government contracts also means that the company will have to mobilize resources to complete these projects. Resource allocation and investment might not necessarily involve funding for research activities, but can simply start with improving the quality of existing products to meet the requirements of the customers. Access money not only promotes and lubricates the wheels of existing economic activities but can also the development of entirely new products, as demonstrated by the Viet A test kit. Viet A was previously a pharmaceutical company unfamiliar with COVID-19-related medical products. It was the needs of the Vietnamese government in responding to the epidemic that motivated the incentives of "research and production" of COVID 19 detection devices. Leveraging relationships with officials, Viet A's director swiftly secured initial research projects on COVID test kit production, enabling the company to

surpass its competitors in the pharmaceutical field, and obtaining huge production and distribution contracts at that time. This suggests how bribery, in certain circumstances, can serve as a pragmatic strategy for dominating the market and navigating the complexities of the business landscape.

Nevertheless, it's crucial to acknowledge the ethical and legal ramifications of such practices, along with their potential long-term consequences on the integrity of the business ecosystem and public trust in institutions (Ang, 2020). While corruption may offer short-term benefits such as fostering innovation and investment, it often comes with hidden and protracted costs that can significantly impede a firm's long-term development and destroy the operation of a competitive market.

When a company can continue to maintain its monopoly position through political connections, entry into the market can be quite challenging for new businesses. Firmly operated interest groups will be daunting barriers for any newcomers. Maintaining a monopoly position for too long can diminish incentives for innovation when the company faces no competition from the market. In the absence of innovation, enhancing product quality might be limited, and prices may rise since there is a sole distributor in the market. Consumers are the ones likely to suffer the most, as they pay taxes to use public goods without any alternative options.

5.2. Policy implications

The positive relationship between access to money (representing market demand) and a firm's innovation output indicates that market demand significantly motivates companies to pursue innovations or introduce new products. The expectation that profits from satisfying market demand will surpass production costs encourages companies to adapt and innovate their offerings. One implication for the government is that promoting and maintaining a robust competitive market, where companies with high-quality products can compete, would effectively stimulate innovation activities.

Currently, the majority of innovation activities in SMEs in Vietnam are still frugal innovations, leveraging existing advantages rather than focusing on R&D or implementing new technologies (Thanh, 2021). Given that government support,

including financial and technical assistance, significantly boosts both innovation inputs (such as R&D activities) and outputs, such support is crucial for enhancing future business innovation capacity. Solutions such as preferential loans tailored to the needs of SMEs, programs supporting technology transfer, and human resource training are promising for improving a firm's innovative capacity.

Additionally, the study suggests that promoting export activities could enhance innovation capability. The government can indirectly foster innovation by simplifying import and export procedures, organizing information support programs about foreign markets for businesses, and assisting businesses in ensuring their products meet the standards of demanding markets.

5.3. Limitation

The first limitation of this study is its reliance solely on secondary data sets. The absence of primary data collection and direct interviews with businesses regarding their encounters with corruption makes the research less comprehensive. Consequently, details concerning the operational dynamics of bribes and access money in SMEs remain unexplored.

Another limitation is the data set was conducted nearly a decade ago. As a result, certain information on innovation and corruption activities may lack updates.

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