**The impact of petty corruption on firm innovation in Vietnam**

Abstract Corruption has been found to have complex effects on firm innovation. Limited theoretical and empirical evidence to date has been rather inconclusive. This study employs econometric estimation techniques to analyze data from small and medium manufacturing enterprises in Vietnam to assess the impact of petty corruption on firm innovation. The empirical results tend to support the Bgreasing^ impact of corruption on innovation. Specifically, informal payments

by Vietnamese firms are shown to encourage overall innovation, product im-

provement, innovation and new innovation. In view of the commonplace busi- ness practice of paying small informal fees to speed up transactions in the inefficient public sector in Vietnam, this finding is not entirely unexpected, though troubling.

# Introduction

Innovation is widely regarded as a key driver of increased productivity worldwide, a view which is put forward most prominently by advocates of the new growth theory [[1](#_bookmark5)–[3](#_bookmark6)]. Innovation can also be viewed as an important channel for economic growth. Different types of innovation in the production and distribution process have been identified in the literature, including, for example, process innovation, product innova- tion, organizational innovation and marketing innovation [[4](#_bookmark7), [5](#_bookmark8)]. We will draw from these distinctions for our analysis.

Corruption refers to the abuse of public office by civil servants or officials for illegitimate private gains [[6](#_bookmark9)]. In country-level empirical studies, corruption is often measured by summary indexes (e.g., Transparency International’s Corruption Perceptions Index or the World Bank’s Worldwide Governance Indicators) while at the firm level, the focus is on bribery behaviors. Some authors (see, for example, [[7](#_bookmark10)]) further classify corruption by scale (grand vs. petty). It has been argued that firms engage in grand corruption to gain market advantages (e.g. to win a government’s procurement contract) and in petty corruption to ‘get things done’ (e.g. to speed up business applications). While grand corruption, associated with high-level public officials and large sums of money, is generally seen as detrimental to long term economic viability ([[8](#_bookmark11)–[11](#_bookmark12)]; see also [[12](#_bookmark13)], in this issue), the impact of petty corruption associated with smaller amounts of money and lower level public officers, can be positive in certain situations, especially where inefficient institutions prevent businesses from operating effectively. Small payments can be used to speed up and improve the quality of public services, that is, the so-called ‘greasing the wheels’ hypothesis (see, for example, [[13](#_bookmark14)–[15](#_bookmark16)]. Empirical evidence of the positive impact of corruption at the country level can be found in Méon and Weill [[16](#_bookmark17)], while Kato and Sato [[17](#_bookmark18)] provide such evidence at the state level in India, where corruption ‘greases the wheels’ of productivity and growth.

The impact of petty corruption is often studied using firm/plant level data. Overall, the literature shows that the impact of corruption is not uniform and depends on the effectiveness of local institutions. While there is evidence of the negative impact of corruption on performance of firms (see, for example, [[18](#_bookmark19)]), at the micro (firm/plant) level, Dreher and Gassebner [[19](#_bookmark20)] provide evidence that corruption may temper the negative effect of regulation on early-stage entre- preneurship. Zhou and Peng [[20](#_bookmark21)] find that bribery hurts growth for small- and medium-size firms, but not for large firms due to the fact that large firms may choose to engage in bribery strategically while smaller firms are forced to do so. Chen et al. [[21](#_bookmark22)] report that bribery helps private firms access bank credit in China. Interestingly, an empirical microanalysis of Indonesian firms by Vial and Hanoteau [[22](#_bookmark23)] demonstrates the co-existence of negative and positive impacts of corruption at the plant level, where those offering bribes enjoy higher productivity growth, but corruption remains harmful at the aggregated level of manufacturing industries.

In this article, we contribute to this body of empirical literature by estimating the impact of petty corruption on an important factor of growth, namely, the innovation activities of firms. In a country like Vietnam, where competitiveness of the private sector is hampered by bureaucratic burdens and poorly paid public sector officials, firms may be tempted to make small informal payments to speed up transactions with the government.1

The study makes use of the small and medium enterprise (SME) survey data conducted biennially since 2005 by the Central Institute of Economic Management (CIEM) and Danish International Development Agency (DANIDA). Our empirical analysis suggests that bribery in the form of informal payments by Vietnamese SMEs greases the wheel of the bureaucratic machinery.

The remainder of this article is organized as follows. The next section provides a succinct summary of theoretical arguments concerning the possible effects of corrup- tion on innovation. This is basically a review of the sand vs. grease the wheel hypotheses as applied to innovation. This theoretical discussion is followed by a review of the evidence from empirical studies, focusing on definitions of key variables, data sources, estimating methods and key findings. The research methodology and the dataset employed in the present study are discussed next. This is then followed by the findings of the present study, which confirm that corruption has a greasing impact on different types of firm innovation in Vietnam.

# Review of theoretical models

The literature on the theoretical relationship between corruption and innovation is meager in terms of the number of studies and their indeterminate findings. A related and much more substantial strand of literature relates to corruption and economic efficiency/growth. The competing sand-the-wheels and grease-the- wheels hypotheses concerning the impact of corruption and economic growth apply equally well in the case of corruption and innovation. That is, these hypotheses can be modified to provide arguments on how corruption ‘sands’ or ‘greases’ innovation.

The sand-the-wheels hypothesis is the formal statement of the common-sense observation that corruption, however defined, is detrimental to innovation and eco- nomic development. This is basically how international organizations such as the International Monetary Fund (IMF), the World Bank or the Organization for Economic Cooperation and Development (OECD) perceive corruption, culminating in international initiatives such as the United Nations Convention against Corruption (UNODC [[23](#_bookmark24)]) or the OECD’s Convention on Combating Bribery of Foreign Public Officials in International Business Transactions [[24](#_bookmark25)].

Various theoretical arguments have been put forward in the literature to support the above orthodox viewpoint. Myrdal [[25](#_bookmark26)] suggested that corrupt public servants may cause unnecessary delays to extract a bribe. Such delays tend to harm innovative efforts. Likewise, Veracierto [[26](#_bookmark27)] constructed a game theoretic model that demonstrates a positive effect of corruption controls on production innovation, although his model does not shed light on the precise channel of this positive effect. As pointed out by Rose-Ackerman [[27](#_bookmark28)], although corruption and competitive auction are analogous, the highest briber may also be the one who is most willing to compromise on the quality of the goods produced once a license is obtained. It is also quite possible that corruption may divert entrepreneurial efforts away from improved production coordination activ- ities, including innovation, into dealing with bureaucracies as suggested by Bó and Rossi [[28](#_bookmark29)]. In this case, corruption may reduce rather than increase the incentive to innovate.

Corruption has also been argued to increase uncertainty and transaction costs and thus make a potentially promising innovative opportunity much less attractive com- mercially (see, for example, Luo [[29](#_bookmark30)]. It has also been suggested that innovative activities may be adversely affected by corruption due to the lack of resources (from investment) or lack of trust in institutions ( [[4](#_bookmark7)]: 81). Shleifer and Vishny [[30](#_bookmark31)] also argue in a similar fashion that the true level of innovation may get inflated in the presence of corruption. This is because corrupt firms would often report having advanced technol- ogies, even though they are not necessarily needed.

Corruption may also act as a barrier to innovation through various indirect channels. For example, Murphy et al. [[31](#_bookmark32)] argue that, due to the economic benefits of corruption to some individuals, economic agents are likely to move from productive to unproduc- tive rent-seeking activities. Such a sub-optimal reallocation would harm human capital accumulation and consequently, innovation. Along a similar line, Kurer [[32](#_bookmark33)] contends that corrupt officials have an incentive to create distortions in the economy to protect their illegal income. Such distortions may hinder innovation. Further, corruption in a host country may also have a negative impact on the inflow of foreign direct invest- ment, which is a well-known source of technology transfer for the host country. Additionally, corrupt practices by foreign firms may also potentially retard the host country’s innovative activity [[7](#_bookmark10)].

The grease-the-wheels hypothesis represents the alternative viewpoint. According to this line of thinking, advanced by Leff [[14](#_bookmark15)] and Leys [[15](#_bookmark16)], corruption can be efficiency- or innovation-enhancing. This is so because corruption may alleviate the distortions in an economy caused by ill-functioning institutions or poor governance structure. An important bureaucratic inefficiency that can be compensated for through corruption is time lost in legally establishing new firms [[15](#_bookmark16)]. This idea has been supported by Lui

[[33](#_bookmark34)] who demonstrated in a formal model that corruption could reduce time spent in a queue. Another important bureaucratic inefficiency is caused by the government’s inability to attract quality public servants. In this context, it has been argued by Leys

[[15](#_bookmark16)] and Bailey [[34](#_bookmark35)] that corruption can improve the quality of public servants when government salaries are low. A similar argument offered by Leff [[14](#_bookmark15)] is that the most generous briber can also be the most efficient producer. Subsequently, Lien [[35](#_bookmark36)] and Beck and Maher [[36](#_bookmark37)] formally demonstrate that corruption can duplicate the outcome of a competitive auction aimed at assigning government procurement contracts. In this sense, corruption can stimulate innovation by assigning the projects to the most efficient firms.

Opponents of the efficiency- or innovation-enhancing schools of thought have argued that the positive impact of corruption is based on weak and unjustifiable assumptions. For instance, the size of the bribe may be determined by corrupt officials rather than by corrupt firms. Similarly, corrupt bureaucrats are most unlikely to work to promote economic growth or innovation. Challenging Leff’s argument [[14](#_bookmark15)], Tanzi [[37](#_bookmark38)]

claims that the rigidities are not natural in bureaucracy, but created by government officials, especially if such obstacles can attract more bribes. Consequently, it is unreasonable to claim that corruption can enhance efficiency or innovation by removing these rigidities. Myrdal [[25](#_bookmark26)] also states that in case of corruption, rather than accelerating the administrative procedure, officials would maintain the rigidities in order to receive more bribes. Kaufmann and Wei [[38](#_bookmark39)] support this view, arguing that since bureaucrats can endogenously choose regulatory burdens and delays, they tend to extract the largest amounts of corruption. Thus, firms are likely to spend more time negotiating with corrupt officials, leading to higher costs of capital.

In contrast to Beck and Mahers’ claim [[36](#_bookmark37)], firms that pay the highest bribe may not necessarily be the most economically efficient ones. The firm which offers the highest bribe may simply do so because they consider bribery an investment with a high rate of return. A subsequent study by Acemoglu and Verdier [[39](#_bookmark40)] suggests that property rights enforcement, which is decided by public officials, is the key condition for wealth creation. Firms need to get it to resolve environmental problems by internalizing externalities and relying on incentives of private owners to conserve resources for the future; it would be difficult and costly for firms if public officials require bribes to complete the administrative process. Consequently, it is necessary to prevent all corruption.

In summary, there are different ways to view the theoretical impact of corruption on innovation, particularly in countries with weak governance structure and institutions. It is necessary to turn to empirical studies to resolve this difference. It is important to note that it is conceivable for both hypotheses to hold simultaneously. A more recent and perhaps more plausible approach is to disaggregate corruption into different types which may in turn have opposite effects on different types of innovation. This approach will be considered below.

# Review of empirical studies

There are very few empirical studies that directly examine corruption as a determinant of innovation at either firm or national levels. The available evidence, however, shows no consensus on the effects of corruption on innovation. Broadly speaking, empirical studies relating innovation to corruption can be classified into two groups by reference to the level of aggregation of data. The first group utilizes data at the country level, whereas the second group employs firm-level data.

Most studies using aggregate data at the national level find that corruption nega- tively affects innovation. In a study of the socioeconomic determinants of innovation, Griffiths and Kickul [[40](#_bookmark41)] classify several EU countries, Japan and the US into four groups (leaders, followers, trailing, and those that are catching up) on the basis of each country’s innovation index. Using data from Eurostat 2006 and supplemented with Transparency International’s 2005 CPI within a multivariate discriminant analysis framework, the authors report a positive relationship between the two variables, i.e. more/less innovative countries have higher/lower CPI (less/more corruption). This finding has also been confirmed by Golla [[41](#_bookmark42)] in her study of the simple correlation between CPI and Summary Innovation Index (SII) in formerly centrally planned EU economies (Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Slovenia, Bulgaria and Romania) for the year 2009.

In a study similar in spirit to that of Griffiths and Kickul [[40](#_bookmark41)]; Natário et al. [[42](#_bookmark43)] set out to test, among other things, the hypothesis that institutional efficiency has a positive influence on a country’s innovative capacity. Using a cluster analysis with data derived from the European Innovation Scoreboard for 2008, Natário et al. [[42](#_bookmark43)] show a strong association between corruption and innovation. The first cluster of countries, including Australia, Germany, Estonia and Luxemburg, has the greatest innovative capacity and is associated with the highest level of corruption control, whereas the third cluster, including Bulgaria, Spain, Hungary, Lithuania, Malta, Poland, Romania and Slovakia, has the least innovative capacity and is associated with the lowest level of control of corruption.

Anokhin and Schulze [[43](#_bookmark44)] draw on longtitudinal data covering 64 countries from 1996 to 2002 to test the hypothesis that improvement in corruption control raises the level of innovation but at a slowing rate. Using random-effects negative binomial regressions where innovation is defined as the number of patent applications, the linear effect of control of corruption on innovation is not significant but the squared-term effect is significantly positive, implying a convex relationship between innovation and corruption.

On the other hand, at the firm level, there is evidence of corruption both sanding and greasing the wheels of innovation. A recent study by de Waldemar [[44](#_bookmark45)] finds strong evidence to support the sand the wheels hypothesis. The data for this study is derived from the World Bank Enterprise Survey for Indian firms in 2005, consisting of 2280 enterprises located in 17 states in all regions of the country. The key variables are product innovation (whether a new product has been introduced) and bribery (sector- state average of firms’ responses). Using probit estimation, bribery is shown to have a negative and significant effect in all specifications. The results are robust in terms of both the endogeneity test (via the use of instrumental probit estimation) and the introduction of a multi-product dummy variable, providing the evidence that corruption in the form of bribery diminishes the probability of new products being introduced by Indian firms.

A relatively recent study using firm-level data is that of Mahagaonkar [[4](#_bookmark7)]. This study focuses on African countries which are often considered to have weak governance structures and burdensome regulations, making them suitable test cases for the sand/ grease the wheels hypotheses. An interesting feature of this study is the recognition of four separate types of innovation: process, product, organizational and marketing innovation. This separation is important because innovative activities that require exclusively the use of public properties such as licenses or permits may be impacted differently by corruption. Using the probit and instrumental variable probit models with the African subset of a large-scale firm-level data set derived from the 2004 World Bank Enterprise Survey, it is found that corruption impedes product and organizational innovation but has a beneficial effect on marketing innovation. Process innovation appears to be unaffected by corruption. The findings of this study lend support to the possibility of simultaneous occurrences of the sand/grease the wheels hypotheses.

There is also evidence showing a positive greasing relationship between corruption and innovation. Krammer [[45](#_bookmark46)]] employs data from 7000 firms in 30 emerging markets to examine the impact of corruption, proxied by bribes, on firm innovation. Despite significant heterogeneity in terms of both bribing practices and innovative performance, the study shows that bribes have a positive effect on firm innovation by greasing the regulatory apparatus to facilitate the introduction of innovative products to markets. However, local application of corrupt practices by individual firms within a sector- region-city unit, can also have negative impacts on firm innovation. More interestingly, the study also reports that the efficiency of bribes is mitigated by the quality of formal (control of corruption) and informal institutions.

The harmful effect of corruption on innovation can also arise from foreign firms’ practices in host countries. Habiyaremye and Raymond [[7](#_bookmark10)] examine transnational corruption and innovation in transition countries using data derived from the fourth wave of the European Bank for Reconstruction and Development (EBRD) – World Bank Business Environment and Enterprise Survey, which relies on information for the year 2007 from about 12,000 firms in 30 countries in Eastern Europe and Central and Western Asia. Three measures of innovation are employed, namely, innovation effort (R&D spending), incremental innova- tion (upgrading of existing goods/services), and major innovation (introduction of new goods/services). Similarly, four measures of corruption are utilized, namely, the percentages of firms in each two-digit industry, taken separately for each country, that engage in grand and petty corruption, which are further broken down into foreign and domestic firms. The authors find that: (i) grand corruption by foreign firms is detrimental to all types of innovation while grand corruption by domestic firms have no effect on the three innovation measures,

(ii) petty corruption by local firms has a stifling effect on innovation efforts and incremental innovation, but not major innovation, while petty corruption by foreign firms has a positive direct effect on major innovation (evidence of a wheel greasing effect), and (iii) the combination of grand corruption by foreign firms and petty corruption by domestic firms causes the most harm to innovation.

Another useful reference for the present study is a recent paper by Rand and Tarp [[46](#_bookmark47)]. Although this study does not examine the relationship between corruption and innovation, it utilizes the same panel data set that will also be employed in the present study. Rand and Tarp [[46](#_bookmark47)] examine the determinants of bribes and changes in bribe- paying behavior in Vietnam in 2005 and 2007. Employing a pooled probit model and a fixed-effects linear probability model, bribe incidence was found to be significantly and positively related to a firm’s size, a firm’s willingness to pay (proxied by profit per employee), and a firm’s outside options (proxied by capital/labor ratio). Conversely, bribe incidence was negatively associated to a time dummy variable. Other explanatory variables such as receipt of government assistance, international trade and business registration are also found to be statistically significant.

Although the literature on corruption and innovation has only recently emerged, the currently available evidence tends to suggest that the connection between innovation and corruption is complex with possible two-way causality and where the impact of corruption on innovation may be dependent upon types of innovation, types of corruption and the local institutions. In the following section, we attempt to deal with the possible endogeneity between corruption and innovation and at the same time explore the impacts of corruption on three types of innovation, namely production innovation, process innovation and product improvement.

# Conclusion

Using panel data of Vietnamese Small and Medium Scale Manufacturing Enterprises from 2005 to 2011, we have examined the impact of corruption on firm innovation in Vietnam and obtained a positive and statistically significant relationship between the two (innovation is broken down into several component parts). Our analysis confirms the greasing effect of corruption on a firm’s decision to innovate in several dimensions such as overall innovation, product improvement innovation and new innovation.

To the best of our knowledge, our study provides the very first evidence for the impact of corruption on firm innovation in Vietnam. While our study is preliminary and rather limited in scope, it nevertheless makes a useful contribution to the literature in general and the recent wave of corruption studies in Vietnam in particular. Further studies are necessary to examine the long-run impact of corruption on firm innovation. In the meantime, the results of our study suggest that in the fight against corruption in Vietnam it is critically important to highlight the true costs of corruption in the long run, as pointed out in other studies reported in this issue.