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Firm-level corruption

Unravelling sand from grease

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Abstract: This paper adds to the recent literature on firm-level corruption by relying on rich data including detailed information on the purpose and amounts of bribe payments among Vietnamese micro, small, and medium firms. Using industry-location averages to instrument for firm-level bribe payments in both a cross-sectional and a panel setting, we provide evidence of a large and significant positive association between corruption and firm performance. We further show that the type of bribe payment does matter: only the payments that can arguably be considered 'voluntary' (rather than extortive) drive this association.

Keywords: corruption, firm performance, small and medium enterprises, Vietnam
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Tables: At end of paper. All tables are the authors' own constructions.

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1 Introduction

Corruption is never a good thing, ethically or economically. But it is also a complex matter. From a second-best perspective, the notion that corruption may 'grease the wheels' of commerce in the presence of weak institutional capacities has been conjectured in academia for a long time. Leff (1964) first placed it as a developing factor in a model, and several authors subsequently argued[1] that corruption can enhance allocative efficiency through two main channels: (i) speeding up bureaucratic procedures and (ii) introducing competition for government resources, resulting in more efficient provision of services than otherwise would have been the case.

This hypothesis, together with the East Asian paradox (high economic growth occurring in the presence of a high level of corruption), has provoked numerous cross-country studies on the relationship between corruption and economic performance,[2] but these studies have not been able to deliver a convincing and robust conclusion. First, cross-country analysis cannot explain within-country variation in firm-level corruption (e.g. Svensson 2003). Even within a highly corrupt economy, firms not paying bribes can perform better (or no worse) than firms paying bribes. The other major drawback of this approach is that it has relied on country-level measures of corruption that are too simple to render the complex nature of the phenomenon. Most cross-country studies rely on perception-based measures of corruption, which have been shown to differ substantially from reality (Olken 2009; Razafindrakoto and Roubaud 2010).

Given the diverse results found across countries, and the need for more precise measures of experienced corruption, within-country variations proved to be critical inputs to country-specific knowledge on the matter, and for anti-corruption policies by extension. Being enabled by increasing data availability, many microeconomic studies have brought the issue to firm-level analysis in recent years with a focus on developing countries.[3] Table A1 in Appendix A provides an overview of all published empirical studies on the relationship between corruption and firm performance that we are aware of. It appears that the findings are as inconclusive as their cross-country counterparts, as both positive and negative effects of generic 'corruption' behaviour are found, and differences in contexts are not sufficient to explain these variations. Even with firm-level data, and the possibility to look at heterogeneous effects by firm size and sector, the approach consisting in a generic indication of corruption fails to capture its complexity. Indeed, various indicators of firm performance are employed in different studies, but virtually all studies use similar measures of corruption, capturing all types of corruption purposes. Paunov (2016) is the only exception, in which the author is able to loosely link bribe payments to obtain an operating licence with quality certificates and patent ownership as well as with machinery investment. As a consequence, existing studies have mainly investigated the net impact of overall corruption on firm performance and left the question of how different types of corruption fulfil their purposes unsolved. To study the 'grease the wheels' hypothesis at firm level in a more precise manner, one needs to acknowledge the heterogeneous nature of bribe payment behaviours and, to do so, to differentiate between the impacts of bribe payments relative to their purposes.

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[1] See Aidt (2003) for a critical review of these theories.

[2] See Aidt (2009) and Svensson (2005) for two critical literature reviews.

[3] See Olken and Pande (2012) for a review of early studies on corruption among individuals, firms, and government officials. In this paper, we focus on firm-level corruption.

A few findings in previous studies indicate that different types of corruption should have different impacts on firm performance. In Philippines, Mendoza et al. (2015) find a positive effect of bribe payments in general on sales growth among small and medium enterprises that actively approached bureaucrats to pay bribes, but no such relationship among those who were asked by the bureaucrats to pay bribes. Similar positive effects on output and labour productivity growth rates are detected among Indonesian firms, which have been argued to pay bribes in an active manner under the Suharto regime (Vial and Hanoteau 2010). Finally, in two South African ports, Sequeira and Djankov (2014) detect, through behaviours of private agents, two types of bribe payments: collusive payments in the form of tariff evasion, which allow private agents to capture sizable rents; and coercive payments in the form of fees additional to the official price of the clearing service, which increase trade costs. These findings, although indirect, suggest that aggregating all types of bribe payments with different purposes into one measure would miss important information about the impact of each type of bribe payment.

The motivation of this paper is precisely to provide evidence on the various types, and differentiated effects, of bribe payments at the firm level. We develop this inquiry using the Viet Nam Small and Medium Enterprises (SMEs) Survey of 2015. This dataset contains detailed information about the purposes of bribe payments as well as various indicators of firm performance, and hence enables us to examine the relationship between different types of bribe payments and their corresponding links with—and effects on—performance. In particular, we hypothesize that there are essentially two types of bribe payments. The first corresponds to the 'grease the wheel' approach, in which firms pay to obtain benefits they would not be able to get without bribe payments. The second type is 'sand the wheel', in which firms pay to obtain something that they would get by default as soon as they fulfilled certain legal requirements. Given two otherwise identical firms, the one paying bribes of the first type should have better performance, while the opposite is true for one paying bribes of the second type. Bribe payments to gain government contracts and to evade tax should fit the first type, and bribe payments to get public services, licences, and permits should fit the second type, while payments to customs may fit either type depending on whether their purpose is to evade tariffs or to expedite bureaucratic procedures.

Public sector corruption is known to be high in Viet Nam. The country scored 33 in the Corruption Perception Index[4] in 2016 (the global average score was 43), which leads us to suspect endemic corruption. Anti-corruption efforts have gained increasing public attention in the past few years. The country passed an anti-corruption law in 2005, which was amended in 2012. It ratified the United Nations Convention against Corruption in 2009. Furthermore, the Political Bureau re-established the Internal Affairs Division in 2012 with the primary purpose of monitoring and investigating corruption. Despite these efforts, recent sociological surveys indicate that corruption is still prevalent and costly from the perspectives of citizens, firms, and public officials (World Bank 2013). The anti-corruption law criminalizes public sector corruption but not that of the private sector. Corrupt behaviour remains widespread in the Vietnamese business environment and firms are likely to experience bribery, political interference, and 'facilitation payments'. Several studies have investigated the causes of firm-level corruption in the Vietnamese context (Gueorguiev and Malesky 2012; Malesky et al. 2015; Rand and Tarp 2012). Rand and Tarp (2012) found that bribe incidence is closely associated with firm-level differences in ability to pay. More visible, relatively large, and formally registered firms are also more likely to make informal payments. But studies on the consequences of such payments are rare. Nguyen and van Dijk (2012)

[4] The Corruption Perception Index score scale is 0 (highly corrupt) to 100 (very clean).

suggested a differentiated effect between the private sector and state-owned enterprises, with perceived corruption having respectively a negative and positive influence on growth.

We examine the effects of bribe payments on firm performance, which we measure, following the literature, with respect to total assets and labour force—which we call ultimate indicators. Furthermore, the dataset enables us to investigate the relationship between corruption and other direct indicators of intermediate performance. In particular, we examine whether bribe payments to gain government contracts affect the percentage of sales to state customers and whether bribe payments to avoid tax affect the amount of tax paid, which provides insights into the short-term efficiency of bribe payment behaviours, and on their overall returns.

As widely acknowledged in previous studies, one major challenge in examining the effect of corruption on firm performance is the endogenous nature of the relationship. In the case of grease corruption, firms with higher potential benefits may be willing to pay more, or firms with specific (unobservable) characteristics may choose to specialize in the rent-seeking sector. As for sand corruption, bureaucrats may approach firms with a higher capability to pay to ask for bribe payments. To overcome this challenge of endogeneity as well as the measurement errors inherent in micro-level data, we adopt an estimation strategy proposed by Fisman and Svensson (2007), in which an industry-location average of bribe payments is used to instrument for firm-level bribe payments. The assumption is that the industry-location average is a function of the underlying characteristics inherent in each particular industry location, which determines to what extent bureaucrats can extract bribes in that industry location, and hence is exogenous to the firm bribe payments in the same industry location. This empirical strategy has also been used in several more recent studies (e.g. Mendoza et al. 2015; Vial and Hanoteau 2010).

With reported bribe payments rather than corruption perception, detailed information about corruption purposes, and a more robust empirical strategy, we are able to provide a more precise picture with respect to the consequences of bribe payments on firm performance in Viet Nam. We believe that our contribution also offers useful lessons to other developing countries.

The rest of the paper is organized as follows. Section 2 describes the data and provides descriptive statistics. Section 3 describes the identification strategy. Sections 4 and 5 present the empirical results for the direct and the ultimate indicators. The results are discussed in Section 6, and Section 7 concludes.

2 Data and descriptive statistics: patterns of bribe payments among Vietnamese SMEs

This paper relies on panel data for Vietnamese manufacturing SMEs. The survey is a collaborative effort of the Central Institute for Economic Management (CIEM) of the Ministry of Planning and Investment of Viet Nam, the Institute of Labour Science and Social Affairs (ILSSA) of the Ministry of Labour, Invalids and Social Affairs of Viet Nam, the Development Economics Research Group (DERG) at the University of Copenhagen, and the United Nations University World Institute for Development Economics Research (UNU-WIDER). The last round of the survey was conducted in 2015, and included 2,647 enterprises in 10 out of the 63 provinces of Viet Nam. In addition to the 2015 round, the empirical analysis relies on the unbalanced panel data from the 2011, 2013,

and 2015 rounds, for a total of 7,696 observations. We perform further empirical investigations relying on the balanced panel data, for a total of 5,154 observations.[5]

The sampling procedure is based on the Establishment Census and the Industrial Survey in Viet Nam, which include only formal enterprises. A significant share of informal firms was explicitly included, using on-site identification. The definition of MSMEs used in the survey follows World Bank and Vietnamese Government definitions: *micro* firms have up to 10 employees, *small* firms have up to 50 employees, and *medium* firms have up to 300 employees. In practice, however, there are a few firms (0.3 per cent) whose total labour force exceeds 300 employees. Thus, we extend the definition to 400 employees in our empirical investigation. The survey includes informal firms (firms without business registration licences or tax codes, and not registered with government authorities) using an on-site identification strategy. Thus, all the informal firms surveyed operated alongside surveyed formal firms, and hence were not representative of the whole informal sector.[6]

Firm total assets in our sample average around VND6,396 million in 2014 (approximately US$287,000)[7], with a range from VND4.5 million (US$200) to VND782,562 million (US$41 million), while total labour force has a mean around 16 workers (including firm owners) with a range from 0 to 399 additional employees. We use a logarithm of these two indicators in our empirical investigation for ease of interpretation of the results. An average firm in the sample paid around VND231 million in taxes (approximately US$10,400) in 2014, with a range from zero to VND72,597 million (US$3.3 million). To retain those firms paying zero taxes in the logarithmic transformation, we add VND1,000 (US$0.04) to their paid taxes. The percentage of total sales to state customers averages around 4.62 in the sample, with a range from zero to 100 per cent, and the set of customers is dominated by state-owned enterprises.

The first set of results consists in describing bribe payment behaviours among this population of firms. Around 43 per cent of firms in our sample report bribe payments (defined in the questionnaire as 'informal fees') in 2014. The average bribe amount is around VND4.3 million (approximately US$195) per year, which accounts for around 0.12 per cent of total revenue, with a maximum of VND1 billion (US$44,800). To retain those firms with zero bribe payment in the logarithmic transformation of the bribe amounts, we add VND1,000 (US$0.04) to their bribe payment values. Among those firms reporting having made bribe payments, around 19 per cent paid bribes *to get connected to public services* (1), 6 per cent *to obtain licences and permits* (2), 24 per cent *to avoid taxes and tax collection* (3), 10 per cent *to gain government contracts or public procurement* (4), 4 per cent *to avoid with customs duties*, and 37 per cent for other purposes. We define sand corruption as bribe payments restricted to categories (1) and (2), and grease corruption as bribe payments in categories (3) and (4). All firm characteristics are summarized in Table 1a (whole sample) and Table 1b (balanced sample).

The descriptive results on bribes largely corroborate those of Rand and Tarp (2012), who document an overall positive association between bribe incidence and firm size (which they interpret as an indication of firms' ability to pay). The overall bribe-payment incidence does indeed increase with total assets and labour force size. This is also true when looking separately at each type of bribe payment: the average incidence of both types, sand and grease, increases by decile of total assets and workforce. This increase is, however, nonlinear in assets: the first three deciles of

[5] Observations including only one or two years were dropped in this case.

[6] See UNU-WIDER (2012) for technical information about the survey.

[7] The exchange rate is approximately VND21,000 per US$.

assets (the lower tier of firms) declare almost no voluntary bribes, while these occur much more often in the upper tier of firms.

Looking at the association between bribe payment and firm's age, type (household or incorporated), and registration status (having a business licence or not) reveals statistically significant differences: younger, formal, and incorporated firms tend to pay bribes significantly more often. Interestingly, this is especially true of the types of bribes classified as 'grease' (while the difference by registration status is insignificant for 'sand bribes'). While the visibility of firms (registration status and incorporation) only marginally exposes them to more extortion, registered and incorporated firms are nevertheless more likely to actively corrupt.

Finally, it appears that the incidence of bribe payment varies greatly by industry, from an incidence of 30 per cent in food and beverages to 80 per cent in paper processing. The regional variation is also large, from 10 per cent incidence in Phu Tho to the highest values in Ho Chi Minh City, Hanoi, and Hai Phong. Overall, the industry-location average incidence (later used as an instrument) has a 0.29 standard deviation (the wood processing industry in Khanh Hoa, anecdotally, having the largest value).

3 Identifying the effects of voluntary and extortive bribe payments on firms

The core of the empirical strategy consists in relating firm-level corruption to various output measures. A first specification, based on the 2015 survey, consists in estimating with ordinary least squares (OLS) the following equation:

$$Y_i = \beta_0 + \beta_1 b_i + \beta_2 X_i + \varepsilon_i \quad (1)$$

where Y_i represents the outcomes of firm *i*, which are successively the intermediate indicators (such as government contracts and tax level) and the ultimate indicators (such as assets, labour force, and value added); b_i is the dummy indicating that firm *i* paid bribes (differentiated by type), and X_i a vector of firm-level characteristics (age, registration status, distance to tax office). We also include province fixed effects in all specifications. This first linear estimation is plagued by the endogeneity of the bribe indicator, as unobserved characteristics might explain bribe payments, as well as previous values of the outcomes (such as firm size, which might render the enterprise more visible and increase the incidence of extortion).

In order to overcome this endogeneity, we follow the instrument used by Fisman and Svensson (2007). Thus, we estimate equation (1) using the 2015 data by two-stage least squares; the b_i variable is instrumented by the z_i industry-location average of bribe payment. We assume that corruption depends on an industry-specific factor and a firm-specific factor. The average amount of bribes common to industry location is explained by underlying characteristics inherent to a particular industry-location, thus determining the incidence of extortion. We expect bribery to differ across locations because, for example, some officials might extract bribes more efficiently than others. In this identification strategy, instrumenting firm-level corruption by industry-location averages removes the bias due to unobservables correlated with firm-level corruption. To make sure as far as possible that these industry-location averages are driven only by industry-location characteristics that are exogenous to firm bribe payments, we use province as our location variable. The dataset has 10 provinces and 20 industries, which gives 157 industry-location identifiers. The average number of firms in each industry location is approximately 17. Forty-five industry-location identifiers contain only one or two observations, which together account for around 2 per cent of total observations. These industry-location identifiers are dropped in the investigation. Finally, the

empirical strategy relies on the 2011 and 2013 surveys to construct a panel of firms. We estimate equation (2) with a two-stage least-squares random-effects estimator:

$$Y_{it} = \beta_0 + \beta_1 b_{it} + \beta_2 X_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

Random effects assume that the firm-specific error term μ_i is not correlated with the predictors X_i and the remainder disturbance ε_{it}. They allow us to account for the influence of differences between firms on the outcome measures. This approach allows us to estimate the average effects across time and between firms. We include in the X_i vector similar firm-level controls. We also control by province and year fixed effects, and additionally include year-location interactions, which capture potential time-varying trends by province.

The key assumption to ensure a consistent estimate of the bribe payment coefficient (β_1) in the panel setting is $corr(b_{it}; \varepsilon_{it}) = 0$ or, in the case of a cross-section, $corr(b_i; \varepsilon_i) = 0$. This may be the case if some unobservable processes occur in the industry-location average occurrence of bribe payment that dissymmetrically affect our performance measures—which would threaten the exclusion restriction. There is, however, no reason to believe that idiosyncratic systematic phenomena occur as regards bribe payments at the industry-location level that could affect firms' performance. In particular, the data cover a sufficient spectrum of regions and firm types to mitigate the risk of including particular situations where bribe payment is systematically higher *and* the economic condition systematically better or worse.

4 The immediate 'returns to corruption': Does it pay to bribe to obtain government contracts and avoid taxes?

We start the empirical analysis by examining the relationship between paying bribes to gain government contracts and sales to state customers. Column 1 in Table 2 presents the estimated results using an OLS estimator for equation (1). The estimated coefficient of bribe to gain government contracts is positive but insignificant, when controlling for firm-level characteristics and province fixed effects. As mentioned above, however, unobservable characteristics may drive the results. In column 2, we use industry-location average to instrument for firm bribe payments. The estimated coefficient is now highly significant and indicates that firms paying bribes to gain government contracts have on average 20 per cent higher sales to state customers. The first-stage F-statistic satisfies the conventional threshold. This result also holds when we drop those industry-location identifiers that have only one to two firms. Further analysis (not shown) also indicates that this result is mainly driven by sale percentage to state-owned enterprises. The third column reports the panel two-stage least-squares coefficients for the unbalanced panel, which fall close to the IV estimation for 2015. The fourth column reports the panel two-stage least-squares coefficients for the balanced panel, which closely match the coefficients for the unbalanced panel but are smaller in magnitude. The estimated coefficients for other control variables have the expected signs and are significant in almost all regression models. They suggest that, on average, older and formal firms have higher, while household firms have lower sale percentages to state customers.

Table 3 presents similar estimated results with respect to total paid taxes in a logarithm. The OLS estimator in column 1 produces a positive and significant estimated coefficient for bribes to avoid taxes, which indicates that firms that pay bribes to avoid taxes on average end up paying higher taxes. This does not indicate that bribe payment is counter-productive, but rather that the bias is high with an OLS specification: only larger firms, which are subject to higher taxes, bribe in order to dodge them. Logically, the estimated coefficient of bribes to avoid tax loses significance when

instrumenting bribe payments in column 2. All coefficients for other control variables have the expected sign; they indicate that, on average, formal firms and firms with higher before-tax profits have higher tax levels, while household firms and firms located far from the tax offices have lower levels of tax payments. Columns 3 and 4 show a similar result with a panel setting. Nevertheless, these results show at best the absence of a reducing effect, and do not indicate that bribing leads to significantly lower taxes. In sum, firms paying bribes to avoid tax are not significantly different in terms of the amounts of tax paid. But to the extent that larger firms bribe more—and should pay more taxes—this provides suggestive evidence that not bribing would increase the amount of tax paid.

These intermediate results can be interpreted as a necessary condition to apprehend the relationship between bribe payment and firm performance: those firms that pay bribes to gain government contracts do more business with the public sector, and those paying bribes to dodge taxes do not pay significantly more tax (even though they are on average larger). These results tend to confirm the validity of the distinction between this type of bribes, which are typically assumed to be voluntary and from which we expect a 'grease the wheel' effect, and the extortive ones.

5 Ultimate indicators: firm-level corruption and firm performance

Does corruption increase firm performance? We investigate in this section the effect of corruption on our ultimate indicators. Table 4 presents the estimated results for general corruption, defined as bribe payments for all purposes. The variable of interest is thus a dummy indicating whether the firm paid any type of bribe. The three outcomes of interest are (i) firm size measured as total assets, (ii) total labour force, and (iii) firm value added. The two first outcomes thus provide insights into the relationship between corruption and firm size, and the last one into its effect on short-term profits. The four columns for each outcome correspond to the OLS, IV, panel 2SLS for the unbalanced panel and panel 2SLS for the balanced panel estimations. The value-added models include logarithms of production factors, assets, and labour, and thus measure the influence of corruption on productivity.

While firms that do pay bribes do not have significantly higher short-term profits, it appears that corruption has a strong association with firm size. All models indicate a large and significant association between bribe payment and log of total assets. The preferred specification using panel 2SLS indicates that on average (between firms and over time), holding equal firms' characteristics, province, time, and differentiated trends, firms paying bribes have their total assets scaled up by 0.78. Similarly, with firm size measured as total labour force, all models indicate a strong and significant association. The preferred specification shows that bribing is associated with a firm size that is 27.3 per cent higher. The 2SLS specifications for the balanced panel show that bribe payments increase total assets by 49 per cent and firm size by 15.8 per cent. Almost all the firms that left the panel had paid bribes, which can explain that, unsurprisingly, when these firms are excluded from the sample in the balanced panel specification, coefficients are lower. There is, however, no association with value added (except for the balanced panel) once both production factors have been controlled for, indicating that corruption could have a long-term influence on firm performance rather than an immediate one. One possible interpretation is that firms that choose not to pay bribes have less chance of achieving sustained growth.

Although they are informative on the overall effect of firm-level corruption behaviours, the results in Table 4 combine all types of bribe payments. One of the key features of this paper is that the data allow us to disentangle bribe payment patterns by their purpose, thereby separating what constitutes extortion from what is, more likely, voluntary corruption. We thus restrict the

indication of corruption to what we consider to be 'sand' bribes, that is, payments for what should be freely accessible public goods. We construct an indication of bribes whose object is to get connected to public services or to obtain licences and permits. At the firm level, 'sand' corruption is supposed to be a pure cost, and one can expect the strong and positive association evidenced above to disappear. The impact of sand bribes is, however, not necessarily negative: some extortive payments in the frame of a heavy bureaucracy may provide a temporary advantage over competitors who choose not to speed up procedures (that is, to the extent that these procedures are inefficient for the whole population).

Table 5 repeats all regressions from Table 4, and allows us to analyse the influence of sand bribes on firm performance. The linear—and biased—estimations on firm-size indicators show a significant (and large) effect. But removing endogeneity by using Fisman and Svensson's instrument, in both the cross-section and the panel setting, reduces the coefficients and reveals the absence of effect. It further indicates a negative, although insignificant, association with value added. The results remain when performing an analysis on the balanced panel sample. In sum, Table 5 shows that the positive relationship between bribe payment and performance found in Table 4 does not exist with respect to sand corruption, even while the latter does not have a direct negative influence.

Symmetrically, Table 6 repeats all the regressions in Table 4 with respect to grease bribe payments, defined as payments to avoid taxes and tax collection and to gain government or public contracts. With OLS estimators in columns 1, 4, and 9, the estimated coefficient of grease bribe payments is positive but significant only with respect to total assets and value added. When we use industry-location average to instrument for firm bribe payments in columns 2/3/4 and 6/7/8, this estimated coefficient increases in magnitude and also becomes highly significant. All the first-stage F-statistics satisfy the conventional threshold. Results hold when performing estimations on the balanced panel sample. The positive relationship between bribe payment and performance found in Table 4 is actually driven by grease bribe payments. It does pay for firms to voluntary bribe to gain contracts with the state.

In order to investigate further the specificity of this relationship between corruption and firms' performance according to the nature of the firm, we repeated the previous estimations on four restricted samples: formal firms, informal firms, household businesses (henceforth HHB), and non-household businesses.[8] Table 7 examines the relationships between paying bribes to gain government contracts and sale percentage to state customers and between bribes to avoid tax and taxes paid with respect to each nature of a firm. Paying bribes to gain government contracts is positively and significantly associated with sale percentage to state customers, irrespective of the nature of the firm. However, this positive relationship is stronger for informal firms than for their formal counterparts and similarly stronger for HHB. This indicates that the benefit of bribery to gain government contracts is higher for informal firms and HHB, which by nature are less in contact with officials and initially have less opportunity to secure contracts with the government.

Bribe payment to dodge tax has a significant impact only on informal firms, for which this pattern is counter-productive. All coefficients for other control variables have the expected sign; they indicate that, on average, firms with higher before-tax profits have higher tax levels, while firms located far from tax offices have lower levels of tax payments.

[8] We perform regressions on the unbalanced panel only (the number of formal household firms in the balanced panel is insufficient).

We investigate the effect of corruption on firms' performance in Tables 8 and 9. Table 8 presents the estimated results of sand corruption on two outcomes of interest: firm size measured as total assets and total labour force.[9] The coefficients associated with sand bribe payments are almost all negative, even if not significant, except for informal firms, for which sand corruption has a strong positive effect on performance. Bribe payments to get access to public services is costly for a firm but the benefit outweighs the cost for informal firms, as they get access to services that would be difficult to obtain by legal procedures.

Table 9 presents the results of grease corruption on total assets and labour force, which fall close to the estimations on the whole sample. Grease payments have a significant positive impact on performance. This effect is much stronger among informal firms than among their formal counterparts.

6 Discussion

These results are overall bad news, but not unexpected. The reason why corruption remains widespread in many developing countries has to lie in some sort of positive effect at the firm level. Even while the phenomenon can be an impediment for the economy as a whole, it seemed very likely that a sufficient distinction between the types of corruption would yield positive and significant results.

A first concern is, however, the robustness of the evidence. How well can survey data capture bribe behaviours, and how detailed is this information? The answer depends on the survey setting, and on the quality of the survey design. In this regard, the SME data have at least two advantages. First, the formulation of the questionnaire is highly suitable for the Vietnamese context. Respondents are asked in the *fees and taxes* module about the *informal fees* that their firm had to pay, and subsequently about the frequency and destination of these payments. Second, the panel dimension does matter as well: even though respondents can initially be reluctant to report such information, repeated interaction can increase trust. The possibility remains, however, that the different types of bribes are reported differently. If voluntary bribes were less frequently declared than extortive ones, the results would then be biased downwards.

Even if corruption is captured with sufficiently low error in the survey, the results must be interpreted with care. We do not claim at this stage that bribes have a causal positive impact on firm performance, and ultimately on their size. The instrument, although increasingly used in the literature, does not provide a perfect identification, but rather an indication of the effect of bribing *more relative to direct competitors*. Indeed, instrumenting by the average bribe payment in the same province and industry eventually yields results that indicate a deviation from this mean. The positive results evidenced in this paper thus indicate that paying bribes more than direct competitors does have a positive return. In this sense, they could be partially linked with other unobserved characteristics of the firms' owners, such as their managerial capacity: is bribing to gain contracts not an indication of aggressive competitiveness?

[9] We dropped the value-added outcome from the investigation, as previous results showed that the different types of bribe payments do not have any significant effect on short-term performance.

7 Concluding remarks

This paper uses a rich SME dataset, combining a recent cross-section survey conducted in 2015 with a panel of firms surveyed over three rounds. It investigates the complex nature of firm-level corruption. Acknowledging the endogeneity of bribe payments, we instrument corruption by industry-location averages. One of the major contributions consists in dividing bribes by their ultimate purpose, which allows us to distinguish the 'sand' (extortive) bribe type from the 'grease' (proactive) one. The results show that firm-level corruption is overall associated with significantly larger firm size (measured by number of workers and assets), but not with higher short-term profits (measured as value added). Further disentangling types of bribes shows that bribing officials to gain new markets does have an immediate and strong association with sales percentage to state customers. These proactive bribes are then shown to be the main driver of the overall association with firm-level outcome, while the extortive types have little or no negative influence. This paper thus sheds light on what could be considered the benefits of corruption from the firms' point of view. Corruption can be perceived, when it comes to an individual decision, as a trade-off between risks and gains; this paper underlines some of the gains that may occur.

References

Aidt, T.S. (2003). 'Economic Analysis of Corruption: A Survey'. *Economic Journal*, 113(491): F632–52.

Aidt, T.S. (2009). 'Corruption, Institutions, and Economic Development'. *Oxford Review of Economic Policy*, 25(2): 271–91.

Asiedu, E., and J. Freeman (2009). 'The Effect of Corruption on Investment Growth: Evidence from Firms in Latin America, Sub-Saharan Africa, and Transition Countries'. *Review of Development Economics*, 13(2): 200–14.

Fisman, R., and J. Svensson (2007). 'Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence'. *Journal of Development Economics*, 83(1): 63–75.

Gueorguiev, D.D., and E.J. Malesky (2012). 'Foreign Investment and Bribery: A Firm-level Analysis of Corruption in Vietnam'. *Journal of Asian Economics*, 23(2): 111–29.

Leff, N.H. (1964). 'Economic Development Through Bureaucratic Corruption'. *American Behavioral Scientist*, 8(3): 8–14.

Malesky, E.J., D.D. Gueorguiev, and N.M. Jensen (2015). 'Monopoly Money: Foreign Investment and Bribery in Vietnam, a Survey Experiment'. *American Journal of Political Science*, 59(2): 419–39.

Mendoza, R.U., R.A. Lim, and A. Ong Lopez (2015). 'Grease or Sand in the Wheels of Commerce? Firm-level Evidence on Corruption and SMEs'. *Journal of International Development*, 27(4): 415–39.

Nguyen, T.T., and M.A. van Dijk (2012). 'Corruption, Growth, and Governance: Private vs. State-owned Firms in Vietnam'. *Journal of Banking and Finance*, 36(11): 2935–48.

Olken, B.A. (2009). 'Corruption Perceptions vs. Corruption Reality'. *Journal of Public Economics*, 93(7–8): 950–64.

Olken, B.A., and R. Pande (2012). 'Corruption in Developing Countries'. *Annual Review of Economics*, 4(1): 479–509.

O'Toole, C.M., and F. Tarp (2014). 'Corruption and the Efficiency of Capital Investment in Developing Countries'. *Journal of International Development*, 26(5): 567–97.

Paunov, C. (2016). 'Corruption's Asymmetric Impacts on Firm Innovation'. *Journal of Development Economics*, 118: 216–31.

Rand, J., and F. Tarp (2012). 'Firm-level Corruption in Vietnam'. *Economic Development and Cultural Change*, 60(3): 571–95.

Razafindrakoto, M., and F. Roubaud (2010). 'Are International Databases on Corruption Reliable? A Comparison of Expert Opinion Surveys and Household Surveys in Sub-Saharan Africa'. *World Development*, 38(8): 1057–69.

Sequeira, S., and S. Djankov (2014). 'Corruption and Firm Behavior: Evidence from African Ports'. *Journal of International Economics*, 94(2): 277–94.

Sharma, C., and A. Mitra (2015). 'Corruption, Governance, and Firm Performance: Evidence from Indian Enterprises'. *Journal of Policy Modeling*, 37(5): 835–51.

Svensson, J. (2003). 'Who Must Pay Bribes and How Much? Evidence from a Cross-section of Firms'. *Quarterly Journal of Economics*, 118(1): 207–30.

Svensson, J. (2005). 'Eight Questions about Corruption'. *Journal of Economic Perspectives*, 19(3): 19–42.

UNU-WIDER (2012). *Characteristics of the Vietnamese Business Environment: Evidence from an SME Survey in 2011*. Helsinki: United Nations University.

Vial, V., and J. Hanoteau (2010). 'Corruption, Manufacturing Plant Growth, and the Asian Paradox: Indonesian Evidence'. *World Development*, 38(5): 693–705.

World Bank (2013). *Corruption from the Perspective of Citizens, Firms, and Public Officials: Results of Sociological Surveys*. Washington, DC: World Bank.

Tables

Table 1a: Descriptive statistics (unbalanced panel)

Variable	2011		2013		2015	
Observations (unbalanced)		2,510		2,539		2,647
	Mean	sd	Mean	sd	Mean	sd
Total assets (million VND)	6,043.45	20,527.34	5,268.89	13,002.46	6,396.07	33,665.24
Total labour force	16.16	32.13	14.62	28.33	15.74	35.40
Sale % to state customers	5.89	14.56	5.46	15.47	4.62	13.50
Total tax paid (million VND)	127.82	914.28	143.38	896.15	235.52	2204.77
Tax share in profits	0.12	0.31	0.20	3.82	0.12	1.49
Bribe incidence	0.38	0.49	0.45	0.50	0.43	0.50
Bribe amount (mean, million VND)	5,475.36	104,787.32	2,881.90	14,909.50	4,302.99	23,230.44
Bribe share in sales	0.003	0.095	0.002	0.016	0.002	0.029
Bribe: government contracts	0.03	0.16	0.05	0.21	0.04	0.20
Bribe: taxes	0.12	0.32	0.08	0.28	0.11	0.31
'Sand' bribe payment	0.13	0.33	0.15	0.36	0.11	0.31
'Grease' bribe payment	0.14	0.35	0.13	0.34	0.15	0.36
Firm age	13.44	9.45	15.57	10.02	16.52	10.16
Formal firm	0.61	0.49	0.51	0.50	0.93	0.26
Household firm	0.64	0.48	0.63	0.48	0.63	0.48
Distance to tax office (km)	11.22	26.29	16.48	32.55	23.84	38.89

Table 1b: Descriptive statistics (balanced panel)

Variable	2011		2013		2015	
Observations (balanced)		1,718		1,718		1,718
	Mean	sd	Mean	sd	Mean	sd
Total assets (million VND)	5,892.0	19,942.9	5,117.5	12,955.8	6,140.3	34,614.2
Total labour force	16.40	33.52	14.44	27.74	15.09	34.01
Sale % to state customers	5.67	13.95	4.93	14.60	4.99	14.70
Total tax paid (million VND)	137.4	1,020.5	115.1	631.1	184.9	1,874.6
Tax share in profits	0.11	0.25	0.23	4.60	0.13	1.48
Bribe incidence	0.37	0.48	0.45	0.50	0.42	0.49
Bribe amount (million VND)	3,186.1	22,518.3	2,522.1	6,724.2	4,141.3	26,420.1
Bribe: government contracts	0.02	0.15	0.04	0.21	0.04	0.20
Bribe: taxes	0.11	0.31	0.08	0.27	0.10	0.30
'Sand' bribe payment	0.14	0.34	0.15	0.36	0.10	0.30
'Grease' bribe payment	0.13	0.34	0.12	0.33	0.14	0.35
Firm age	13.5	9.3	16.3	9.7	18.3	9.7
Formal firm	0.62	0.49	0.55	0.50	1.00	0.02
Household firm	0.68	0.47	0.66	0.47	0.66	0.47
Distance to tax office (km)	11.6	26.9	17.1	33.3	23.7	38.9

Table 2: Sale percentage to state customers

	Sale percentage to state customers			
	(1)	(2)	(3)	(4)
	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)
Bribe to gain government contracts	1.417	20.231**	16.85***	12.31***
	(1.606)	(8.146)	(3.123)	(4.029)
Firm age	0.072**	0.073**	0.037*	0.040*
	(0.029)	(0.030)	(0.019)	(0.024)
Formal firm	0.860**	0.690	1.023**	1.620***
	(0.370)	(0.421)	(0.417)	(0.541)
Household firm	-6.444***	-5.124***	-4.375***	-4.179***
	(0.674)	(0.767)	(0.441)	(0.546)
Constant	6.764***	6.154***	8.334***	8.354***
	(1.015)	(1.056)	(0.940)	(1.178)
Province dummies	YES	YES	YES	YES
Time dummies	na	na	YES	YES
Time*Province	na	na	YES	YES
Observations	2,612	2,560	7,440	5,000
R-squared	0.078	na	na	na
First-stage F-statistic	na	10.39***	na	na

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 3: Ln total taxes paid

	Ln total taxes paid			
	(1)	(2)	(3)	(4)
	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)
Bribe to avoid tax	0.261**	0.687	0.605	0.483
	(0.115)	(0.613)	(0.377)	(0.467)
Firm age	0.004	0.004	-0.004	-0.003
	(0.004)	(0.004)	(0.003)	(0.004)
Formal firm	1.036***	0.987***	1.132***	1.195***
	(0.196)	(0.195)	(0.062)	(0.079)
Household firm	-3.127***	-3.064***	-3.071***	-3.000***
	(0.095)	(0.126)	(0.080)	(0.099)
Distance to tax office	-0.016***	-0.015***	-0.022***	-0.021***
	(0.001)	(0.001)	(0.001)	(0.001)
Profit before tax	0.061***	0.058***	0.000***	0.000***
	(0.018)	(0.017)	(0.000)	(0.000)
Constant	2.779***	2.706***	3.390***	3.423***
	(0.229)	(0.267)	(0.159)	(0.214)
Province dummies	YES	YES	YES	YES
Time dummies	na	na	YES	YES
Time*Province	na	na	YES	YES
Observations	2,644	2,583	7,262	4,910
R-squared	0.586	na	na	na
First-stage F-statistic	na	20.36	na	na

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 4: General corruption and firm performance

	Ln total assets				Ln total labour force				Ln value added			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)
General bribe payments	0.450***	1.560***	0.779***	0.488***	0.332***	0.823***	0.273***	0.158**	0.030	0.187	0.0899	0.197**
	(0.062)	(0.284)	(0.112)	(0.126)	(0.041)	(0.205)	(0.065)	(0.076)	(0.034)	(0.214)	(0.079)	(0.094)
Firm age	0.008***	0.010***	0.008***	0.001	0.002	0.003**	0.001	-0.002	-0.006***	-0.006***	-0.006***	-0.006***
	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Formal firm	0.606***	0.531***	0.228***	0.178***	0.336***	0.303***	0.0933***	0.0711***	0.085	0.080	0.0343*	0.0146
	(0.090)	(0.096)	(0.031)	(0.036)	(0.054)	(0.057)	(0.018)	(0.022)	(0.065)	(0.067)	(0.019)	(0.024)
Household firm	-1.615***	-1.268***	-1.202***	-1.147***	-1.392***	-1.238***	-1.108***	-0.980***	-0.228***	-0.200***	-0.240***	-0.200***
	(0.064)	(0.109)	(0.052)	(0.062)	(0.043)	(0.076)	(0.031)	(0.038)	(0.041)	(0.052)	(0.028)	(0.035)
Log capital									0.210***	0.208***	0.202***	0.200***
									(0.013)	(0.015)	(0.008)	(0.009)
Log employment									0.889***	0.882***	0.879***	0.866***
									(0.020)	(0.023)	(0.013)	(0.016)
Constant	7.122***	6.406***	7.893***	8.188***	2.183***	1.866***	2.582***	2.768***	3.040***	2.991***	2.820***	2.803***
	(0.139)	(0.233)	(0.099)	(0.132)	(0.078)	(0.153)	(0.060)	(0.083)	(0.108)	(0.120)	(0.069)	(0.091)
Province dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	na	na	YES	YES	na	na	YES	YES	na	na	YES	YES
Time*Province	na	na	YES	YES	na	na	YES	YES	na	na	YES	YES
Observations	2,645	2,645	7,476	5,023	2,645	2,645	7,476	5,023	2,540	2,540	7,261	4,910
R-squared	0.501	na	na	na	0.487	na	na	na	0.8374		na	na
First-stage F-statistic		235.74				235.74				200.37		

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 5: Sand corruption and firm performance

	Ln total assets				Ln total labour force				Ln value added			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)
Sand bribe payments	0.313***	0.504	0.428	0.167	0.190***	0.350	-0.00873	0.0202	-0.089*	-0.134	-0.026	-0.010
	(0.082)	(0.460)	(0.158)	(0.191)	(0.062)	(0.314)	(0.095)	(0.117)	(0.048)	(0.277)	(0.112)	(0.130)
Firm age	0.008***	0.008***			0.002	0.002			-0.007***	-0.007***		
	(0.003)	(0.003)			(0.002)	(0.002)			(0.002)	(0.002)		
Formal firm	0.635***	0.634***	0.268***	0.211***	0.358***	0.357***	0.109***	0.080***	0.087	0.085	0.031*	0.017
	(0.090)	(0.090)	(0.030)	(0.037)	(0.054)	(0.054)	(0.018)	(0.022)	(0.064)	(0.064)	(0.019)	(0.024)
Household firm	-1.740***	-1.731***	-1.377***	-1.331***	-1.486***	-1.478***	-1.199***	-1.068***	-0.230***	-0.233***	-0.282***	-0.250***
	(0.061)	(0.065)	(0.042)	(0.053)	(0.042)	(0.044)	(0.027)	(0.035)	(0.040)	(0.041)	(0.025)	(0.032)
Log capital									0.212***	0.215***	0.887***	0.878***
									(0.013)	(0.014)	(0.012)	(0.014)
Log employment									0.893***	0.895***	0.886***	0.201***
									(0.020)	(0.021)	(0.007)	(0.009)
Constant	7.366***	7.338***	8.285***	8.455***	2.369***	2.346***	2.727***	2.837***	3.061***	3.049***	2.780***	2.763***
	(0.132)	(0.150)	(0.078)	(0.103)	(0.076)	(0.089)	(0.050)	(0.068)	(0.107)	(0.108)	(0.068)	(0.088)
Province dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	na	na	YES	YES	na	na	YES	YES	na	na	YES	YES
Time*Province	na	na	YES	YES	na	na	YES	YES	na	na	YES	YES
Observations	2,645	2,645	7,482	5,023	2,645	2,645	7,482	5,023	2,593	2,540	7,266	4,910
R-squared	0.493	na			0.476	na			0.8357	na		
First-stage F-statistic	na	23.93			na	23.93			na	15.74		

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 6: Grease corruption and firm performance

	Ln total assets				Ln total labour force				Ln value added			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)	OLS	IV	Panel-IV (Unbalanced)	Panel-IV (Balanced)
Grease bribes	0.153**	1.508***	0.818***	0.702***	0.059	0.776***	0.423***	0.407***	0.118***	0.220	0.056	0.144
	(0.077)	(0.392)	(0.148)	(0.168)	(0.058)	(0.250)	(0.087)	(0.102)	(0.037)	(0.214)	(0.096)	(0.115)
Firm age	0.007***	0.008***			0.002	0.002			-0.006***	-0.006***		
	(0.003)	(0.003)			(0.002)	(0.002)			(0.002)	(0.002)		
Formal firm	0.632***	0.592***	0.251***	0.186***	0.357***	0.336***	0.092***	0.068***	0.085	0.081	0.029	0.017
	(0.090)	(0.092)	(0.031)	(0.037)	(0.054)	(0.054)	(0.019)	(0.023)	(0.065)	(0.065)	(0.019)	(0.024)
Household firm	-1.726***	-1.462***	-1.288***	-1.204***	-1.484***	-1.344***	-1.115***	-0.980***	-0.209***	-0.193***	-0.276***	-0.238***
	(0.063)	(0.101)	(0.047)	(0.058)	(0.043)	(0.066)	(0.030)	(0.037)	(0.041)	(0.054)	(0.027)	(0.034)
Log capital									0.210***	0.211***	0.885***	0.878***
									(0.013)	(0.013)	(0.012)	(0.014)
Log employment									0.892***	0.894***	0.883***	0.200***
									(0.020)	(0.020)	(0.007)	(0.009)
Constant	7.376***	7.052***	8.171***	8.280***	2.383***	2.212***	2.627***	2.713***	3.040***	3.010***	2.778***	2.745***
	(0.133)	(0.163)	(0.083)	(0.114)	(0.076)	(0.095)	(0.053)	(0.074)	(0.108)	(0.114)	(0.069)	(0.089)
Province	YES	YES	YES	YES	YES	YES	YES	YES			YES	YES
Time	na	na	YES	YES	na	na	YES	YES	na	na	YES	YES
Time*Province	na	na	YES	YES	na	na	YES	YES	na	na	YES	YES
Observations	2,645	2,645	7,482	5,023	2,645	2,645	7,482	5,023	2,593	2,540	7,266	4,910
R-squared	0.491	na			0.474	na			0.836	na		
First-stage F-statistic	na	41.80			na	41.80			na	31.67		

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 7: Sale percentage to state customers and ln total taxes paid: sample restricted

	Sale percentage to state customers			
	(1)	(2)	(3)	(4)
	Panel-IV Formal firms	Panel-IV Informal firms	Panel-IV Household business	Panel-IV Non HH business
Bribe to gain government contracts	21.07***	23.47***	21.33***	15.54***
	(3.787)	(5.407)	(6.233)	(4.142)
Firm age	0.0174	-0.0472	0.0239	0.0959**
	(0.023)	(0.031)	(0.019)	(0.044)
Constant	8.584***	7.450***	5.079***	8.206***
	(1.113)	(1.552)	(1.275)	(1.396)
Province dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
Time*Province	YES	YES	YES	YES
Observations	5,105	2,335	4,757	2,683
	Ln total taxes paid			
	(1)	(2)	(3)	(4)
	Panel-IV Formal firms	Panel-IV Informal firms	Panel-IV Household business	Panel-IV Non HH business
Bribe to deal with tax	0.819	4.550***	1.065	-0.440
	(0.373)	(1.256)	(0.773)	(0.377)
Firm age	-0.0204***	-0.0386***	0.00120	0.00906*
	(0.004)	(0.007)	(0.004)	(0.005)
Distance to tax office	-0.0182***	-0.0332***	-0.0247***	-0.00349*
	(0.001)	(0.002)	(0.001)	(0.002)
Profit before tax	0.0000368***	0.0000990***	0.000730***	0.0000262***
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	3.654***	2.010***	0.456*	4.360***
	(0.171)	(0.425)	(0.260)	(0.158)
Province dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
Time*Province	YES	YES	YES	YES
Observations	5,019	2,243	4,687	2,575

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 8: Sand corruption: sample restricted

	Ln total assets				Ln total labour force			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel-IV Formal firms	Panel-IV Informal firms	Panel-IV Household business	Panel-IV Non HH business	Panel-IV Formal firms	Panel-IV Informal firms	Panel-IV Household business	Panel-IV Non HH business
Sand bribe payments	0.287	1.943***	-0.236	0.546	-0.050	0.601**	-0.133	-0.206
	(0.205)	(0.444)	(0.221)	(0.297)	(0.131)	(0.239)	(0.118)	(0.193)
Firm age	-0.006**	-0.004	0.005**	0.003	-0.008***	-0.007***	-0.001	0.005
	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.002)	(0.001)	(0.003)
Constant	8.207***	7.794***	7.143***	8.485***	2.570***	2.346***	1.492***	2.960***
	(0.100)	(0.179)	(0.129)	(0.133)	(0.069)	(0.109)	(0.071)	(0.100)
Province dummies	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES
Time*Province	YES	YES	YES	YES	YES	YES	YES	YES
Observations	5,138	2,338	4,194	2,243	5,138	2,338	4,194	2,243

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 9: Grease corruption: sample restricted

	Ln total assets				Ln total labour force			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel-IV Informal firms	Panel-IV Formal firms	Panel-IV Non HH business	Panel-IV Household business	Panel-IV Informal firms	Panel-IV Formal firms	Panel-IV Non HH business	Panel-IV Household Business
Grease bribe payments	2.222***	1.066***	0.538***	0.894***	0.950***	0.573***	0.154***	0.409***
	(0.394)	(0.178)	(0.160)	(0.233)	(0.235)	(0.109)	(0.103)	(0.117)
Firm age	-0.005	-0.003	0.013***	0.008***	-0.007***	-0.005***	0.010***	-0.000
	(0.004)	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)
Constant	7.569***	8.028***	8.277***	6.854***	2.241***	2.423***	2.778***	1.286***
	(0.183)	(0.105)	(0.107)	(0.126)	(0.113)	(0.073)	(0.080)	(0.071)
Province dummies	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES
Time*Province	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2,338	5,138	2,819	4,871	2,338	5,138	2,819	4,871

Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Appendix A: Overview of firm-level (published) empirical studies

Table A1: Existing (published) empirical studies on corruption and firm performance

Study	Country	Data	Corruption	Performance	Method	Result
Sand the wheels						
Fisman and Svensson (2007)	Uganda	Cross-section 1997	Bribe payments (general corruption)	Sales growth	IV	Negative
Asiedu and Freeman (2009)	Transition countries	Cross-section 1998	Bribe payments (general corruption)	Investment growth	LS	Negative in transition countries No relation in Latin America
Nguyen and van Dijk (2012)	Viet Nam	Cross-section 2005	Perception (general corruption)	Total assets (book value)	LS	Negative in private sector No relation or positive in public sector
O'Toole and Tarp (2014)	Developing and transition countries	Cross-section 2002–2010	Bribe payments (general corruption)	Return on investment	IV	Negative among SMEs No relation among large firms (state- and foreign-owned companies)
Paunov (2016)	Developing and emerging countries	Cross-section 2007–2011	Bribe payments (operating license)	Certificates ownership Patents ownership Machinery investment	LS	Negative on quality certificate ownership No relation to patent ownership Negative on machinery investments Only affects small firms
Grease the wheels						
Vial and Hanoteau (2010)	Indonesia	Panel 1975–1995	Bribe payments (general corruption)	Output growth Productivity growth	IV	Positive on output growth Positive on labour productivity growth
Sharma and Mitra (2015)	India	Cross-section 2005–2006	Bribe payments (general corruption)	Efficiency and profit Productivity Product innovation	LS	Negative on efficiency and profit No relation to productivity Positive on product innovation
Mendoza et al. (2015)	Philippines	Cross-section 2012	Bribe payments (general corruption)	Sales growth	IV	Positive among active payers No relation among passive payers