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The effect of market competition on bribery in emerging economies: An empirical analysis of Vietnamese firms

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ABSTRACT

Studies of firm bribery have not fully examined how market competition conditions the effects of social norms on firms' bribe payments. We suggest that firms pay bribes to obtain abnormal rents and/or to conform to accepted rules of corruption. These motivations operate differently, depending on the level of market competition. Using data from an annual survey of 10,000 Vietnamese firms between 2006 and 2017, we find that in environments characterized by open competition, bribery is positively associated with long-standing norms in the business social context, while in closed-competition environments, bribe payments are functions of rents that accrue from uncertainty in policy-making.

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1. Introduction

Business-related bribery has been extensively examined in both developed and emerging economies with scholars proposing different, even conflicting, explanations about exactly why firms choose to pay bribes (Belousova, Goel, & Korhonen, 2016; Diaby & Sylwester, 2015; Dong, Dulleck, & Torgler, 2012; Khan, 2006; Persson, Rothstein, & Teorell, 2013; Rose-Ackerman, 1978; Sundström, 2019; Svensson, 2003). In this paper, we define business bribe as a payment or other form of inducement, which is not required by law, and is paid by a firm to a public official (bureaucrat or politician) with the expectation that the official will fulfill a request or grant an illegal favor. There are two general theoretical perspectives for assessing why firms engage in such behavior. The rent-seeking perspective argues that firms can actively engage in bribery with an expectation of abnormal rents (Ades & Di Tella, 1999; Rose-Ackerman, 1978; Shleifer & Vishny, 1993; Svensson, 2003). Bribery, in this vein, is seen as a competitive game with winners and losers from each bribe transaction. The greater the number of firms paying bribes for a permit or contract, the less attractive it is for a new firm to join this game, all else equal. On the other hand, scholars following a social norm perspective argue that firms pay bribes to fit in with or to adhere to norms of corruption in the business environment, and that a firm's bribery depends largely on the firm's expectation of bribery by other firms (Dong et al., 2012; Fisman & Miguel, 2007; Persson et al., 2013; Pierce & Snyder, 2008; Sundström, 2019; Uhlenbruck, Rodriguez, Doh, & Eden, 2006; Venard, 2009). Here, the bribery game is about conformity, where firms participate to survive rather than to win. The greater the number of firms paying bribes, the more the pressure on the next firm to do the same. These two perspectives provide conflicting insights on the relationship between market competition and bribery at the firm level and confusing advice to policy makers and practitioners seeking anti-corruption reforms.

We argue that the theoretical contradiction results from analysts describing different types of bribery and the dynamics of firm-bureaucrat interactions that occur in distinct institutional and social contexts. The rent-seeking expectations are informed by rational institutionalists' arguments that relate bribery with the level of institutional development (North, 1990; Williamson, 2000), which determines policy uncertainty and officials' discretion and risk of punishment (Kaufmann, 1997; Khan, 2006; Lederman, Loayza, & Soares, 2005; Marquette & Peiffer, 2018; Mauro, 1998). Firms, in the rent-seeking view, are active players and engage in *collusive* bribery game with an expectation of abnormal profit (Ades & Di Tella, 1999; Aidt, 2009; Shleifer & Vishny, 1993). Thus, the rent-seeking view is more relevant in closed market competition contexts, where abnormal profits are available

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(Ades & Di Tella, 1999; Aidt, 2009; Shleifer & Vishny, 1993). By contrast, the social norm perspective draws upon the collective action view of corruption (Dong et al., 2012; Persson et al., 2013; Persson, Rothstein, & Teorell, 2019) and sociological institutionalism (J. W. Meyer & Rowan, 1977; Scott, 1995), modeling firm bribery as a function of conformation with accepted norms and expectation of others' behavior (Dong et al., 2012; Galang, 2012; T. V. Nguyen, Ho, Le, & Nguyen, 2016; Persson et al., 2013; Venard, 2009). Firms, in the social norm perspective, are passive players (X. Zhou, Han, & Wang, 2013), who are forced to pay bribes as simply additional business operating costs (Zhou & Peng, 2012). While relevant in both contexts of closed and open competition, the social norm perspective is more powerful in predicting *non-collusive* bribery in open competition, where the motivation for gaining abnormal profits does not exist.

In this paper, we hypothesize and demonstrate empirically that the rent-seeking and social norm explanations for corruption are both relevant, but in different socioeconomic contexts. Using data from an annual survey of 10,000 Vietnamese firms between 2006 and 2017, we find that in environments characterized by open competition, non-collusive bribery is positively associated with long-standing norms in the business social context, while in closed-competition environments, collusive bribe payments are functions of rents that accrue from uncertainty in policy-making. Vietnam is a highly relevant context for studying this topic since the country is suffering from high levels of corruption (2019; WB., 2012) and market competition varies greatly across location and industry (Malesky, Gueorguiev, & Jensen, 2015; T. V. Nguyen, Le, & Bryant, 2013).

Our paper makes three important contributions. First, we provide a synthetic theory that unites two very conflicting epistemological approaches to understanding bribery into a common framework and provides robust statistical evidence for this theory. Second, we move beyond the question of "Why do firms pay bribes?" to "How does market competition condition whether firms engage in collusive versus non-collusive bribery?" This is an important extension, because analysts have offered contradictory predictions about the direct effect market competition on bribery (Alexeev & Song, 2013; Belousova, Goel, & Korhonen, 2016; Diaby & Sylwester, 2015), while its moderating role has not been studied extensively. We thus contribute to work arguing that failing to specify the context of bribery and the dynamics of these behaviors can lead to inconclusive findings regarding the determinants and consequences of bribery for firm performance (T. V. Nguyen et al., 2016; Philp, 2001; J. Q. Zhou & Peng, 2012). Such ambiguity has hampered anti-corruption programs, because in different contexts, firm bribery may follow different strategic logics and the approaches clearly requires different policy interventions to resolve (Khan, 2006; Marquette & Peiffer, 2018; Persson et al., 2013, 2019). Third, we offer concise empirical operationalizations of collusive and non-collusive bribery that can be easily replicated other scholars looking to replicate or build upon our findings.

Our argument proceeds as follows. In the Theoretical Background section, we develop hypotheses on the determinants of firm bribes and how these relationships are moderated by market competition. The unique firm-level data over eleven years and empirical strategy are presented in the Methods section. After reporting the findings in the Results section, we offer our deeper discussions on theoretical and managerial implications of our work.

2. A theoretical framework for studying firm bribery

Why do firms pay bribes? Scholars have answered this question from vastly different perspectives. The two most common theoretical perspectives employed by scholars studying firm behavior are those emphasizing the use of bribes in rent-seeking (Rose-Ackerman, 1978; Shleifer & Vishny, 1993; Svensson, 2003) and those interested in the role that social norms play in motivating and perpetuating corruption (Dong, Dulleck, & Torgler, 2012; Fisman & Miguel, 2007; Levin & Satarov, 2000; Nee, 1998; Persson, Rothstein, & Teorell, 2013; Uhlenbruck, Rodriguez, Doh, & Eden, 2006; Venard, 2009). Advocates of the two competing perspectives model firm bribery behavior differently in their formal theoretical work. In the social norm perspective, firms are modelled as passive players in the bribery game (X. Zhou et al., 2013). That is, firms pay bribes to follow the accepted social norms of corruption, which may not relate to efficiency (Fisman & Miguel, 2007; Uhlenbruck et al., 2006; Venard, 2009) and/or because where most others pay, the cost of not paying is prohibitively high (Persson et al., 2013; Sundström, 2019). In the rent-seeking perspective, by contrast, firms choose to pay bribes with an expectation of receiving abnormal profits if their offer is accepted (Kaufmann, 1997; Lee, Oh, & Eden, 2010; Luo, 2002; Rose-Ackerman, 1978; Shleifer & Vishny, 1993). While the social norms approach is more about informal conventions (Darden, 2008; Fisman & Miguel, 2007; T. V. Nguyen et al., 2016; Venard, 2009; Zhan, 2012; J. Q. Zhou & Peng, 2012), the rent-seeking perspective refers more frequently to formal rules that influence the entry of businesses as well as collusion between public officials and firms (Alexeev & Song, 2013; Heilman, Jones, & Kaufmann, 2003; J. S. Hellman, Jones, Schankerman, & Kaufmann, 1999; Kaufmann, 1997; Rose-Ackerman, 1978; Shleifer & Vishny, 1993). Social norms perspectives also focus on the firm's expectations of other firms' bribery behavior (Dong et al., 2012; Persson et al., 2013), where the rent-seeking perspective underlines the firm's expectations of abnormal gains from corrupt transactions (Galang, 2012; Lambsdorff & Teksoz, 2004).

The two perspectives also differ in the types of bribes they focus on. The social norm perspective tends to highlight non-collusive (or coercive) bribes (Alexeev & Song, 2013; Lindgren, 1993; Shleifer & Vishny, 1993), while the rent-seeking perspective tends to focus on collusive bribes (Alexeev & Song, 2013; Domadenik, Prašnikar, & Svejnar, 2016; Galang, 2012; Mauro, 1998; Rose-Ackerman, 2002). These same types are also sometimes referred to with the short hand, bribes with (collusive) and without theft (non-collusive), indicating whether the government suffers losses from the government transaction. To offer a bit more precision, Table 1 presents a comparison of the two modal bribe types. Non-collusive bribes are bribes paid to get services that the firms are eligible to receive by law, such as to complete standard administrative procedures (Argandoña, 2005; Bailes, 2006). This type of bribe adds to firm costs with minimal benefits in return, such as saving time or avoiding harassment. These services are non-exclusive in that a firm's access to service through bribery does not exclude other firms' access to that same service. Collusive bribes, however, are bribes paid to a public official in exchange for (unfair) business advantages, such as to help firms to reduce costs or access lucrative, limited business opportunities. These bribes can be thought of investments in addition to direct costs. Collusive bribes are often embedded in legal and social relationships with some level of trust between the bribe paying firms and the public officials (Lambsdorff & Teksoz, 2004). Examples of collusive services include government contracts or permissions to do business in restricted areas or sectors (Galang, 2012; Malesky et al., 2015; Mauro, 1998; J. Q. Zhou & Peng, 2012) or to avoid violation fines (Sundström, 2019). In the case of administrative procedures to receive documents that may produce monopoly or oligopolistic rents for the recipient, such as granting a limited number of licenses for natural resource exploitation, public service provision, or construction, scholars code these as collusive rather

Table 1
Two Types of Firm Bribery.

	Non-collusive	*Collusive*
Definition	A bribe paid to a public official in exchange for a public (administration) service that should have been free of charge	A bribe paid to a public official in exchange for (unfair) business advantages
Payers of bribes	All firms can make non-collusive payments	A limited number of firms have opportunities to make collusive payments
Winners and losers	- Only the public officials benefit (bribes) - Firms lose (incur additional costs - bribes) - The state does not lose (directly from the transactions) since the formal fees were transferred to the state (*corruption without theft*)	- Both firms and public officials benefit from the bribe payments (collusion) - The state loses since the officials do not turn the transaction fees to the state. They may hide the transactions (*corruption with theft*)
Instigator(s) of bribes	Public officials	Both public officials and firms could instigate the bribes
Common activities	- Resolve an administrative matter - Expedite an administrative process	- Business licenses in restricted areas - Land access - Government contracts - Tax or other fee negotiations
Legitimacy of results	Obtain something to which the payer is entitled	Obtain something to which the payer is NOT automatically entitled
"Price"	Known to firms	Unknown to firms
Affect other firms	Not directly	Directly affect competing firms

than non-collusive, even though they involve standard bureaucratic activities. This is because the specific document is exclusive (it is not available to all firms) and bribery can induce the bureaucrat to reward a limited set of payers.

The concept of regulation is associated with both types of bribery, but has different implications depending on the specific corrupt activities described. In general, a regulation (or regulatory requirement) is a rule based and meant to carry out a specific piece of legislation (such as requirements for business regulation, protection of environment, or safety standards). Regulations are enforced usually by a regulatory agency formed or mandated to carry out the purpose or provisions of a legislation. In considering non-collusive corruption, the primary manifestation of regulation is the burden of administrative procedures (sometimes referred to pejoratively as "red tape") necessary to comply with the regulation. For instance, the paperwork required to register a business or the workplace safety standards mandated by law to protect workers that are subject to inspections by a regulatory agency. These requirements increase the number of interactions with government necessary to obtain a particular service or operate the business legally, increasing the opportunity and amount of non-collusive bribery payments. Bhagwati (1982) famously argued that these regulations were often created or altered specifically to generate bribes to officials.

When thinking about collusive corruption, however, the very regulation itself can be altered by a bribe payment. For instance, existing firms may pay to enhance the burden of registration regulations to create entry barriers for new firms or alter the technical standards of a safety requirement to limit the number of eligible competitors. These activities are collusive because they increase the rents available in a sector for the bribe payer and require the participation of corrupt officials. Thus, even regulations designed to reduce corruption, such as antitrust policy, can be distorted by collusive bribery between affected firms and those writing the regulations. This insight informs our hypotheses regarding policy predictability below (Dal Bó, 2006; Laffont & Tirole, 1991).

The rent-seeking perspective refers primarily to such collusive bribes, which help the bribe paying firm gain abnormal profits. By contrast, the social norm perspective considers both types, but is especially powerful in explaining non-collusive bribes. First, when corruption is rampant and pervasive, a firm pays non-collusive bribes because it feels a pressure to conform to the 'rules of the game', albeit usually informal rules that it learns from interactions with others (Galang, 2012; T. V. Nguyen et al., 2016; Venard, 2009). From sociology-driven institutional perspective, conforming to accepted rules or being 'isomorphic' to the environment is a way to gain legitimacy and survive (DiMaggio & Powell, 1983; Scott, 1995). Second, when most other firms pay bribes, the firm's being honest, i.e., not paying bribes and/or reporting corrupt officials, would not change the game (Persson et al., 2013). In addition, refusing to pay non-collusive bribes would impose some costs on the firm, such as delays of service delivery and/or an official's harassment. These perceived costs are high when corruption is rampant and accepted, partly because the official's bribe request or revenge would likely go unchallenged by either existing legal systems or social norms. Note that the third reason is different from material-based cost/benefit calculation in the rent-seeking perspective in that it also includes moral costs (Dong et al., 2012).

These perspectives also provide very different predictions on the roles of market competition on firm bribery. The rent-seeking perspective suggests that increased competition among firms drives firm and industry profits to zero, thereby reducing a firm's willingness to pay collusive bribes (Alexeev & Song, 2013; Diaby & Sylwester, 2015; Shleifer & Vishny, 1993). Consequently, to maintain the stream of rents and generate this form of competitive bribery, public officials may erect barriers to new business entry (Fisman & Svensson, 2007; Malesky, Gueorguiev, & Jensen, 2015; Mauro, 1998; Svensson, 2003). Importantly, however, competition cannot be reduced entirely to zero for these restrictions to generate corrupt behavior, as some opportunity to benefit from discretionary standards must remain in order for firms to believe they have a chance to benefit from bribe payments. On the other hand, the social norms perspective argues that increased market competition results in higher peer pressure and long queues in getting public services, inducing firm to bribe government officials (Alexeev & Song, 2013; Belousova, Goel, & Korhonen, 2016; Wu, 2018). Whether a firm engages in bribery, however, depends upon how bribery is accepted as a norm by public officials and other firms. In other words, market competition could have a positive association with non-collusive bribery, conditioned by social norms of corruption.

The previous discussion suggests that predictions of rent-seeking and social norms perspectives on firm bribery depends on a number of factors, such as the nature of bribes or level of market competition. The following sections elaborate how rent-seeking and social norms of corruption predict firm bribery and how market competition conditions these predictions.

2.1. Social norms of corruption

The social norm perspective of firm bribery resembles the literature on sociological institutionalism (Helmke & Levitsky, 2004;

Nee, 1998; Uhlenbruck, Rodriguez, Doh, & Eden, 2006; Venard, 2009; X. Zhou et al., 2013). According to this perspective, a firm engages in malfeasance, such as bribery, not necessarily for reasons of efficiency, but rather to conform to the established, albeit informal, 'rules of the game' (Helmke & Levitsky, 2004; T. V. Nguyen et al., 2016; Scott, 1995) and to become "isomorphic with their environment" (J. W. Meyer & Rowan, 1977). Conforming to the "rules of the game" helps firms gain the legitimacy and resources needed to survive. Firms give bribes mainly because "others do the same," and because it is a prerequisite for survival in their environment (Fisman & Golden, 2017; Mauro, 1998). Scholars consider corruption norms to be established once expectations for bribe paying are clearly understood by all involved, and bribe exchanges become a routine part of interactions with government officials. By contrast, when bribe paying is uncommon, a firm may not want to engage in bribery, as public officials' expectations for bribe payment are uncertain and they risk punishment by appearing to act unethically or illegally (Fisman & Golden, 2017). The more other firms engage in corruption, the more an individual firm may feel pressured to do the same, even when this may still harm the firm's long-term development. Several studies have found empirical evidence consistent with this argument (Alon & Hageman, 2013; Collins, Uhlenbruck, & Rodriguez, 2009; T. V. Nguyen et al., 2016; Venard, 2009).

Two compelling examples of social norms of corruption demonstrate the persistence of corruption when actors are transported to new institutions. Diplomats from corrupt countries are less likely than their peers to pay traffic tickets in the United States, believing that they can easily bribe their ways out of the fines (Fisman & Miguel, 2007). Similarly, immigrants from corrupt countries are more likely to engage in bribery behavior in the United States, having been taught the social norms that their parents imported from their home countries (Simpser, 2013). In emerging economies, firms are more likely to engage in bribery, if their competitors also engage high levels of corrupt behavior (Venard, 2009). These studies provide persuasive evidence that social norms and conventions dictate views about corruption, which in turn shape the behavior of actors who internalize them (Darden, 2008).

The social norms perspective suggests that firm paying bribes depends upon the informal conventions of corruption in the firm's surrounding environment (T. V. Nguyen et al., 2016; Pierce & Snyder, 2008; Venard, 2009; X. Zhou et al., 2013). From a collective action perspective, a firm's individual expectations about the behavior of other firms is an essential component driving the firm's bribery (Dong et al., 2012; Persson et al., 2013). The classic model of social norms demonstrates that there are two possible equilibria (Andvig & Moene, 1990; Fisman & Miguel, 2007). In an environment where bribery is seen as normal and a large proportion of other firms already pay, firms may have no choice but to pay bribes in order to have any chance of accessing government services to which they are entitled (Alon & Hageman, 2013; Dong et al., 2012; Mauro, 1998; Persson et al., 2013). At the same time, there exists an alternative "no bribe" equilibrium, where very few firms pay, and as a result, the social costs of engaging in bribery are high. Under these conditions, the vast majority of firms will choose not to pay. Because informal norms, co-created by public officials and bribe-paying firms, constrain their behavior this practice is akin to adhering to the "the rules of the game" in a "Northian" sense (Levin & Satarov, 2000; North, 1990). The corruption norms are also reinforcing in that a larger share of firms paying bribes encourages new firms to accept and follow the practice (Darden, 2008; Dong et al., 2012; Persson et al., 2013). Note that the social norms perspective does not require the assumption of a direct link between bribes and firm efficiency.

H1a: The more corruption is a social norm in the business context, the more money, as a share of revenue, individual firms will expend on bribery.

We expect that market competition strengthens the positive relationship between social norms of corruption and firm bribery. This is true for both non-collusive and collusive bribes. For non-exclusive public services, such as administrative procedures, firms generally pay bribes to conform to established rules (i.e., non-collusive bribes) (Alexeev & Song, 2013; Bailes, 2006; Bunker & Casey, 2012; J. Q. Zhou & Peng, 2012). In an environment characterized by open competition, the number of firms is big and the queue for public services is long (Alexeev & Song, 2013; Wu, 2018). We argue that more firms will imply greater pressure from social norms, especially corruption norms, on any single firm. Furthermore, when the queue for a public service is long, public officials have greater bargaining power in the bribery game. The long queue, when combined with accepted corruption norms creates a strong incentive to bribe. In closed competition, the line is shorter and the need to cut in is less severe. Thus, we expect a weaker effect of corruption norms on a firm's likelihood to pay non-collusive bribes in closed-competition environments.

As the name suggests, collusive requires some coordination and implicit sharing of rents between bribe paying firms and public officials (Lambsdorff & Teksoz, 2004; Rose-Ackerman, 1978; Sundström, 2019). Collusive opportunities are built through personal relationships, social networks, or past business deals (Lambsdorff & Teksoz, 2004). We argue that while social norms of corruption may not affect the amount of collusive bribes for each transaction, the norms do affect the need for and the costs of building collusive opportunities. Where corruption is rampant and pervasive, it becomes clear to a firm that building and maintaining some relationships with public officials is an effective way, sometimes the only way, for the firm to compete and receive favorable deals (Persson et al., 2013; Sundström, 2019). That need is enhanced in open-competition situations where more firms are seeking collusive opportunities. In addition, the higher the number of firms competing for attention, the stronger the public officials' bargaining power, raising the costs of building and maintaining the relationships (Rose-Ackerman, 1978). In brief, a combination of strong social norms of corruption with open competition would enhance the need for and the costs of collusion, hence increasing collusive bribes. Thus, for both non-collusive and collusive bribes, the effect of social norms on incentives for bribery is stronger in open competition than in closed competition. Therefore, we hypothesize:

H1b: The size of the positive relationship between corruption norms and firm payment of informal fees is stronger in open-competition than in closed-competition environments.

2.2. Rent-seeking perspective

The rent-seeking perspective argues that rent-maximizing officials demand bribes from firms when those officials have the ability to take discretionary actions (Heilman, Jones, & Kaufmann, 2003; Khan, 2006; Lin, Morck, Yeung, & Zhao, 2016; Rose-Ackerman, 1978). At the same time, firms are willing to engage in collusive bribery when they expect to earn abnormal rents from participating in these discretionary activities (Heilman et al., 2003; Malesky et al., 2015). This perspective resembles rational institutionalism (North, 1990; Williamson, 2000) and suggests that level of institutional development influences a firm's decision to engage in bribery.

A key determinant of collusive bribery is the predictability of policies. In environments characterized by high levels of discretion, policy is less predictable as key governmental decisions remain up for grabs. This is why some scholars have used a principle-agent lens to model the relationships between politicians and bureaucrats in understanding it. In unpredictable environments, firms have incentives to use bribes to influence policy decisions, shape

regulations, or obtain needed resources, licenses, or contracts (Galang, 2012; Lin, Morck, Yeung, & Zhao, 2016; X. Zhou et al., 2013). The literature on state capture (J. Hellman, Jones, & Kaufmann, 2000; J. S. Hellman et al., 1999) has demonstrated that incumbent firms play a role in shaping the regulation by bribing public officials and capturing the policy-making process. By contrast, when policy-making and implementation are predictable, there is less opportunity for gatekeepers to manipulate decisions, the rents available from corruption decline, and firms' motivations to engage in collusive bribery are low.

This perspective suggests that the level of institutional development is negatively associated with corruption. Under strong market-supporting institutions, policies are developed and enforced in a transparent manner. As a result, firms can predict policy changes, and the level of corruption should be low (Aidt, 2009; Lederman et al., 2005). By contrast, in the absence of developed market institutions, firms have to turn to informal institutions, such as personal networks, to obtain necessary information and resources for businesses (Peng & Luo, 2000). That reliance on informal institutions is associated with higher levels of corruption (or bribes) (Kaufmann, 1997; North, 1990, pp. 65, 68). In addition, exogenous shocks that generate policy uncertainty (such as unexpected leader entrants and exits) unsettle ongoing legal, contractual relations between economic actors as well as informal, corrupt associations. Both public officials and firms feel compelled to hedge against these risks by forming new alliances, which generates increases in corruption in the immediate aftermath of political shocks (Goel & Saunoris, 2017). Thus, we can expect that the general predictability of policy formulation and implementation is negatively associated with bribery.

Policy predictability can vary even within the country, especially when studying emerging and/or transition economies (Gao, Murray, Kotabe, & Lu, 2010; K. E. Meyer & Nguyen, 2005; T. V. Nguyen et al., 2013). Scholars have examined institutional variation between sectors (Malesky et al., 2015), provinces (K. E. Meyer & Nguyen, 2005; T. V. Nguyen et al., 2013), or industrial districts (Bertolini & Giovannetti, 2006). Fisman & Svensson, 2007 argue that a combination of industry-location is a good unit for studying within-country variation of institutional development, as it reflects both sectoral and locational characteristics of policy and implementation. Therefore, the general institutional hypothesis suggests that policy predictability is negatively related to bribery across industry-location combinations.

H2a: The less policy is predictable (predictability) in the business context, the more money, as a share of revenue, individual firms will expend on bribery.

The effect of policy predictability on firm bribery varies with level of market competition (Diaby & Sylwester, 2015). As above, we discuss this for both collusive and non-collusive bribes. According to our logic, policy uncertainty has a clearer effect on bribe payment for exclusive services, i.e., collusive bribes. In an open-competition environment, rents from policy uncertainty are quickly driven to zero as more and more competitors enter the market (Alexeev & Song, 2013; Shleifer & Vishny, 1993), reducing the incentives for collusive behavior. By contrast, in a closed-competition environment, abnormal rents from bribery are sustainable, because only a limited number of firms are competing for the opportunity. In this scenario, the higher the policy uncertainty, the higher the possible rents from bribery. Therefore, policy uncertainty should have a clear positive relationship with collusive bribes (i.e., firm bribery for exclusive services) in closed competition environment. For non-collusive bribes (bribes for non-exclusive services), policy predictability often coincides with transparency and certainty in the service provision, reducing the opportunities to cut in line. Therefore, we hypothesize:

H2b: The positive relationship between policy uncertainty and firm bribery is larger in closed-competition than in open-competition environments.

It is important to note that our theoretical concepts of market competition, corruption norms, and policy predictability appear to be theoretically correlated to each other, as they all, at root, arise from the behavior of corrupt officials, who have incentives to limit entry, develop corruption norms, and create policy uncertainty. We acknowledge this risk but argue that these theoretical arguments apply to the bureaucracy in general. Individual officials serving at specific times with specific bureaucratic responsibilities may only have limited influence on market competition, corruption norms, and policy predictability. That is, an individual bureaucratic gatekeeper offering an investment license, for instance, does not have power to shape corruption norms or generate uncertainty about the number of licenses, s/he is merely implementing policies determined at a higher level of authority. Furthermore, there are other factors that influence these variables and are exogenous to the officials' attitude. Market competition could stem from a natural monopoly or historical development of the sector/location that does not depend on the focal officials. Similarly, corruption norms are gradually developed over time and should not depend on individual, bureaucratic gatekeepers. Furthermore, much of policy predictability is not under the control of lower-level bureaucrats. Below, for instance, we take advantage of the exogenous assignment of new provincial leaders, which is determined by central policies of promotion and advancement.

3. Research methods

3.1. Data

We use data from the Provincial Competitiveness Index (PCI), a firm survey funded by the United States Agency for International Development (US-AID) and administered by the Vietnam Chamber of Commerce and Industry (VCCI) since 2006. The PCI's objective is to rank provinces on ten dimensions of governance, based on the feedback from private firms (Malesky, 2007). The PCI is the most well-known and reliable survey in Vietnam today, as is cited by government officials, businesses, and researchers a rigorous dataset that they rely upon for decision-making and investment decisions.[1] In 2016, US-AID hired the American firm Management Systems International (MSI) to conduct an external evaluation of the research effort (Contract No. AID-440-C-14–00003). MSI concluded, "In general, the PCI program has met all targets with high-quality surveys conducted, success in mobilizing engagement by provincial leaders and business associations in the dissemination of the survey results, and improving the acceptance of PCI and the programs results by provinces," (2016).

The annual survey is one of the most comprehensive and systemic firm surveys in Vietnam, applying a stratified random sampling strategy for each province, based on the size, sector, and age of firms. Every year, about 10,000 domestic business owners or managers answer the survey.[2] The total contact rate is 30%, but the adjusted response rate is 60% when incorrect addresses and ghost firms (registered firms that do not exist in

[1] See http://eng.pcivietnam.org/ for more details on the survey methodology. The page also includes provincial level data, questionnaires, and testimonials from academics, politicians, and government officials on the reliability and utility of the data.

[2] The adjusted response rate on the survey is remarkably consistent over time and across space. Annually response rates range between 56% and 63%, and no individual province has an annual adjusted response rate lower than 50% in any given year.

practice) are subtracted from the denominator (Anseel, Lievens, Schollaert, & Choragwicka, 2010; Mellahi & Harris, 2016)[3]. More importantly, as Table 2 shows the item response rate from firms that agreed to the overall survey on corruption questions is high for sensitive questions. Item response rate on corruption questions were always higher than 70%, and for the key measures used to create bribe costs and informal norms, response rates were 79% and 89% respectively. Moreover, seventy percent of respondents are either the CEO or managing director of their firm, implying that they have a very clear idea about the actual firm bribery behavior. In short, while no self-reported measures of corruption are perfect, these data appear only moderately affected by non-response bias.

We create a dataset that organizes every PCI survey between 2006 and 2017 into eleven repeated cross-sections of Vietnamese firms. This allows us to exploit changes in the economic environment over time to test our hypotheses above, and ensure that our results are not the artefact of a single-shot survey within a particular year.

3.2. Measures

Measurements of other variables are described in Table 2 below. Here, we describe the operationalization of key concepts in our analysis.

Bribe Size: Our dependent variable is the reported amount of bribes that firms pay as a share of annual revenue (i.e. sales). We selected this measure, because our theory requires an outcome variable measuring scale of corruption - the amount that firms are willing to expend on bribery.

Our measurement goal differs somewhat from other work that has focused on scope – the frequency of bribe payments – and therefore raises three additional methodological challenges. The first issue is standardization, which has theoretical and empirical implications. Theoretically, the danger of the size of bribe payments varies dramatically by the size and performance of the firm. A large firm or a firm with high cash flow generated by brisk sales can easily afford absolute bribe payments that would be prohibitive for small firms or even large firms dealing with shortfalls in sales. We therefore need a metric that captures the costs and risk of bribery for business success that is comparable across our respondents. Empirically, the distribution of absolute bribe payments tends to be highly skewed with a long right tail, which requires transformation for econometric modeling. The second issue is the memory intensiveness of recalling bribe payments and adding them into a single number. In highly corrupt areas, where bribe payments are more frequent, the difficulty of answering correctly increases, which can lead to systematic measurement error that is correlated with the outcome variable. The third issue is social desirability bias and specifically the fear of admitting to an illicit activity. Techniques, such as shielded response and list questions have been developed for reducing social desirability bias in answering sensitive questions about the bribe frequency (Coutts & Jann, 2011; Malesky et al., 2015),[4] however, no such method currently exists for measuring the scale of bribe payments.

To address the problems of standardization and memory, we use a highly popular measure of corruption size that appears on the PCI survey, but originated in the World Bank's Business Enterprise Performance Survey (BPS), and is used in the construction of the World Bank' own "Control of Corruption" measures in their Governance Index (Kaufman, Kray, & Mastruzzi, 2013).[5] Firms are asked to respond on an eightpoint scale, indicating the bribe size of relative to their annual sales revenue.[6] Thinking of business activities (i.e. taxes, training, investments) in relation to revenue is a normal activity of CEOs and managers, who commonly simplify business decisions involving trade-offs of activities measured in different units. This approach resolves the standardization dilemma by asking respondents to gauge the bribe payment relative to their own assessment of sales. Asking in terms of revenue, also helps compare bribe payments to outlays for taxes and investment expenses, which are also standardized by revenue on the PCI survey. The eight-point scale is used to reduce the danger of memory intensiveness by simplifying the calculations. Of course, while it reduces systematic error (e.g. error correlated with the independent variable) it does generate stochastic measurement error (e.g. white noise), because respondents are estimating and rounding their answers. However, we see this as less damaging to our analysis, because stochastic error reduces the probability of finding significant relationships. Following Bai, Jayachandran, Malesky, and Olken (2017), we create a continuous variable by taking the mean value of each of the eight option ranges.[7] While we show in the appendix that the approach has no effect on our theoretical conclusions, it allows for more intuitive description of substantive effects.

Certainly, the World Bank measure does not eradicate social desirability bias. Firms may still feel uncomfortable revealing the true size of their payment. On the surface, this does not appear to be a severe threat in our case. As we reported above, 79% of respondents answered this question. Of those, 80% report non-zero bribery costs in the past year. As a validity check, we also looked at how our corruption measures performed relative to unmatched count technique (UCT) questions, often referred to as List Experiments, included in the PCI instrument (see Malesky et al., 2015). These shielded response questions have been shown to reduce both social desirability and non-response bias. At the provincial level, our measure of bribe costs appears highly correlated with the frequency of bribe payments for business entry generated by the UCT ($r = 0.61$). Thus, while no measure of bribe scale is foolproof, we feel reasonably confident in the validity of this measure for our analysis.[8]

Open- and Closed- Competition Environments: Our biggest empirical challenge is to measure the level of completion that an individual firm faces in as exogenous a manner as possible. Our strategy is to separate firms into two groups - one group in provinces and industries with limited constraints on entry (*open competition*) and the other where entry into the market is restricted (*closed competition*). Our hypotheses on different bribery behavior can then be tested by using this dichotomous classification as a moderating variable.

Following our theoretical argument above, we used the competitiveness level of the markets in which they operate to group the firms. The level of competition is proxied by average numbers of days firms in an industry-location need to complete registration procedures. We subtract the days for the respondent firm from the mean, so the measure captures the registration wait for other firms in their province-industry, but is not mechanically correlated

[3] This is quite high. Adjusted response rates commonly published in management journals range from 40% to 60%. (Anseel et al., 2010; Mellahi & Harris, 2016).

[4] See <https://dimewiki.worldbank.org/wiki/List_Experiments>

[5] See < https://info.worldbank.org/governance/wgi/Home/Documents> for a list of indicators used in the World Bank's "Control of Corruption Index." The question we use appears in the BPS section, "Percentage of total annual sales do firms pay in unofficial payments to public officials?"

[6] "On average, what percentage of revenue do firms in your line of business typically pay per year for informal charges to public officials?" 1. 0%; 2. <1%; 3. From 1 to under 2% 4. From 2 to under 5%; 5. From 5 to under 10%; 6 From 10 to under 20%; 7. From 20 to 30%; 8. Above 30%

[7] We also run all analyses using the eight point scale using an ordinal probit set-up as well, and receive similar results. See Appendix A for details.

[8] See Appendix F for details

Table 2
Summary of Measures.

Variable	*Measure*	*Item Response Rate*	*Note*
Bribery severity	Percentage of informal fees in total revenue. Firms reported with 8 groups (e.g., 0%, <1%, from 1 to 2%, etc. to greater than 30%)	79%	Continuous measure defined by midpoint in range of value options
Types of Competition	Dummy variable is created for two groups of firms.- *Open Competition* includes firms in province-industry dyads, minus the respondent, that have average registration times of 30 days or less.- *Closed Competition* includes firms in industry-province dyads that have average registration time greater than 30 days.	84% on underlying registration question	Dummy variable of 0 (Open) and 1 (Closed). Named in the model as Closed-Competition-Seeking (CC = 1)
Industry-Province Corruption Norm	Percentage of firms in the province-industry dyad, minus the respondent, that said paying informal fees was normal for firms like them, excluding the firm itself. The higher the percentage, the more corruption was a norm in the context.	89% on underlying bribery question	Continuous data from PCI survey
Policy Predictability	Whether firm is operating in province with an executive, People's Committee Chair in his/her first term, indicating lack of predictability.		Administrative Handbook from Ministry of Home Affairs; (New PCOM = 1)
Control variables	- Firm ages: Number of years in operation- Firm size: Number of employees (1–8 scale)	90%/91%	Continuous data from PCI survey
Inspection Bribe Normal	If firm admitted to paying regulatory bribe during inspection, a follow-up was asked. Firms answering 3 that the informal payment was standard were coded as 1; those answering 1 or 2 were coded as zero D6: During any of the inspections, did you provide a gift or informal payment to the examiner?1 Yes (go to Question 6.1) 0 No (Skip to Question 7) D6.1: Who initiated the informal payment? 1. I offered it; 2 The examiner requested it; 3. It is a standard. Nobody needed to say anything.	81% for D6; 100% for D6.1	Asked in 2016 and 2017. (Malesky, 2017; Malesky, Phan, & Pham , 2018)
Know Bribe Size	D11. Before you pay for an informal charge, does your firm know in advance what the amount might be? (5 Always; 4 In most cases; 3. Occasionally; 2. Rarely; 1. Never)	70%	Only asked in PCI 2016 (Malesky, 2017)
Service Delivered	12. In your opinion, if a firm in your province pays 'informal charges', how often is the service or document delivered as the firm expected? (5 Always; 4 In most cases; 3. Occasionally; 2. Rarely; 1. Never)	73%	Asked for all PCI years.

with individual answers of bribery by the respondent. The industry-location combination reflects market structure, sectoral characteristics, and local policy implementation issues, and thus is a reasonable institutional context for examining level of competition and opportunities for officials to extract bribes (e.g.,Fisman & Svensson, 2007). We disaggregate firm sectors into two-digit ISIC codes[9] and 63 provinces to construct province-industry dyads. This created 2884 industry-location combinations, with an average of 32.5 (sd = 61) firms in each combination.

Our examination of regulation and consultation with domestic firms and legal experts in Vietnam suggested that a normal business registration process would take about thirty days to complete all necessary procedures. The World Bank's Doing Business in Vietnam also suggested that it would take between 37 days (2008) and 20 days (2015) for a firm to finish all nine registration procedures in the period 2005 – 2012 (WB & MY). Further, our data show that about 80% of firms need about thirty days or less to complete registration procedures.

Therefore, our categorization of the firms is as follows. *Open competition* includes firms in province-industry dyads (subtracting the respondent firm) that have average registration waiting times of thirty days or less, where entry is unrestricted and, according to our theory, firms are most likely to pay non-collusive bribery. *Closed competition* includes firms in province-industry dyads that have average registration waiting times greater than thirty days, where entry is restricted by regulation or scarce resources, and firm corruption is highly related to rent-seeking bribery.[10] Fig. 1 provides a histogram capturing the level of competition faced by each firm in the sample. The gray dashed line depicts the thirty-day cutoff between firms facing open and closed competition.

In line with our theory, *closed-competition* firms appear to operate in environments with higher available rents. As a validity check of the match between theory and operationalization, our estimation of median pre-tax revenue per employee is about 295 Million VND ($13,400 USD) in Group B (*closed competition*) as opposed to 257 Million VND ($11,714 USD) in Group A (*open competition*). More importantly for our theory of higher rent availability, business is significantly more concentrated in *closed-competition* environments. Fig. 2 shows that the average Herfindahl-Hirschman Index (HHI) based on registered capital is 0.43 in *closed-competition* province-industry dyads, compared to 0.39 in *open-competition* dyads. Industries with HHIs above 0.40 are extremely concentrated, allowing market participants to benefit from monopoly pricing and consequently implying higher rents (Kwoka, 1977). Employment concentration shows a similar pattern with HHIs for *closed-competition* and *open-competition* dyads, and the difference for both is highly, statistically significant ($p < 0.001$). In sum, firms coded as *closed competition* operate in more profitable and more concentrated province-industries, which is consistent with our expectations, as they compete in arenas with higher rents where collusive bribery is more likely.

Norms of Corruption: To measure corruption norms, we take advantage of a separate PCI question, also borrowed from the World Bank's ICA survey, which asks firms whether "informal charges" are common for firms like them.[11] To be clear, this is different from the measure of bribe costs, which asks firms about their own behavior, as this question asks firms to speculate about other firms in their locality and industry. That is, they project away from their own behavior to identify what they believe the social norm is for firms in their situation. To create this measure, we simply measure the share of firms agreeing with this question in each province-industry dyad, minus the respondent firm to further reduce the relationship between an individual firm's bribery and the indicator.

Policy Predictability: Self-reported measures of uncertainty can be problematic because perceptions are endogenous to the quali-

[9] We use the revision 4 structure (https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27). In cases where the single-digit sector has<50 firms, we use the single-digit or broad sector.

[10] Below we also test our results against a range of different cut-offs.

[11] Do you agree with this statement: "Firms in my line of business usually have to pay extra 'informal payments.'?1) Strongly agree; 2) Agree; 3) Disagree; 4) Strongly disagree

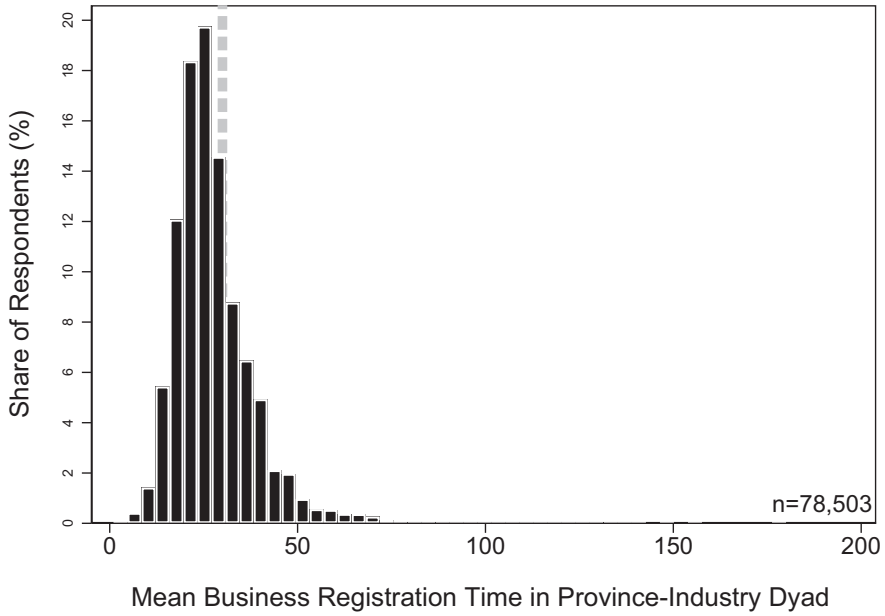

Fig. 1. Histogram of Business Registration Time. The gray dashed red line represents the cutoff of 30 days for business registration, which we use to separate *open-competition* (<=30) from *closed-competition* environments (greater than30).

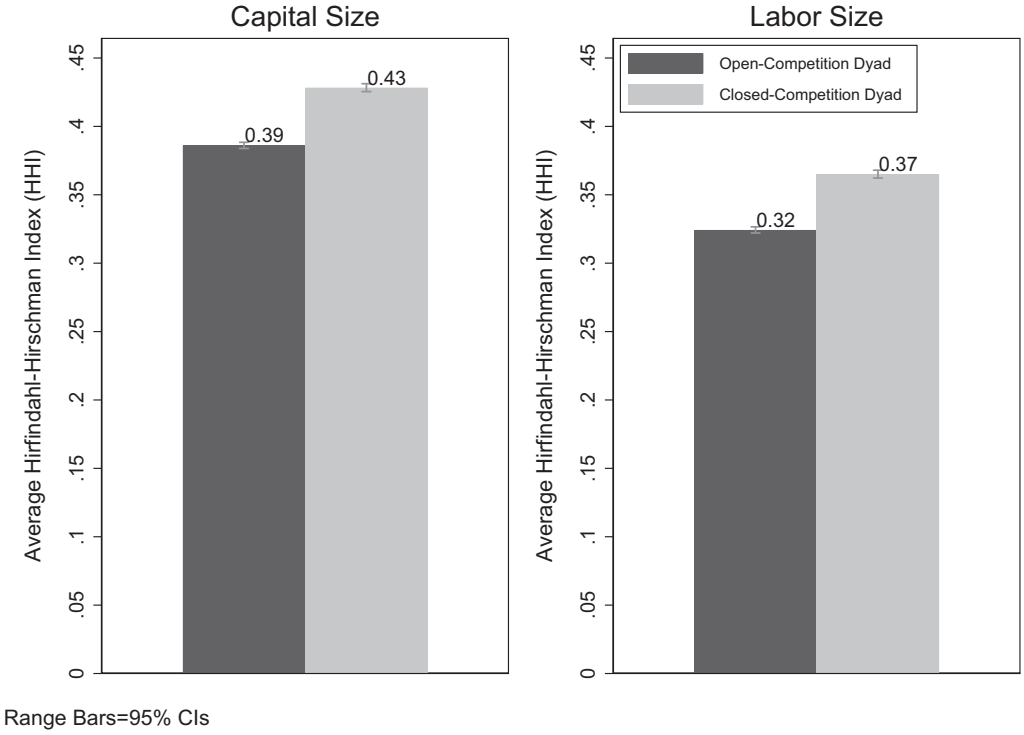

Fig. 2. Herfindahl-Hirschman Index (HHI) by Province-Industry Dyad. Bars depict average HHI for firms in each province-industry dyad by annual revenue. Range bars represent 95 percent Confidence Intervals. Above 0.40 indicates a severely concentrated dyad.

ties and experiences of the respondent. To capture policy uncertainty for Hypothesis 2 in as exogenous a manner as possible, we take advantage of a unique feature of the Vietnamese administrative system – the length of tenure of the provincial executive. This means that what matters is the shock of new leadership, not the specific attributes of the leader. People's Committee Chairs (PCOMs) are effectively the governors of Vietnamese provinces, responsible for all administrative activities.[12] Via a series of laws in the early 1990s, most business-government interactions were

[12] See Appendix C for a full list of People's Committee Chairmen used in the analysis.

decentralized to the provincial level, including business registration, environmental and safety inspections, labor oversight, local government procurement, and land allocation. Provincial departments of line ministries are "dual subordinate," meaning they report both to the PCOM as well as the relevant national line ministry. In practice, however, appointments of department directors and budget allocations are set by the PCOM, closely aligning department interests with those of the province. Moreover, proximity matters. The PCOM interacts with department directors regularly, while the line ministries are hundreds of kilometers away in Hanoi. As a result, many studies have documented that the provincial government, more than the central government, is the relevant administrative level when thinking about the institutional climate facing firms (Malesky, 2008; K. E. Meyer & Nguyen, 2005; T. V. Nguyen et al., 2013; Tran, Grafton, & Kompas, 2009).

Terms of PCOMs last five years and no PCOM is allowed to serve more than two consecutive terms in the same province. Fortunately for our research design, appointments are cyclical occurring immediately after Communist Party Congresses in 2006, 2011, and 2016, so there is no discernible spatial pattern to new appointments. New PCOMs are found in rich and poor, large and small, urban and rural provinces in all regions of the country. Importantly, there are no systematic differences in age, education, home province between leaders in Term 1 and Term 2.[13] When new PCOMs are appointed, businesses must adjust to the new modes of government and relationships between government agencies. During that time, decisions and policy implementation of PCOMs are far more variable. From the perspective of our theory, limited predictability implies more opportunity to influence decisions over policy, land concessions, procurement, and allocation of restricted licenses.

To validate this proxy, Fig. 3 demonstrates that firms experience more uncertainty in predicting policy formulation and policy implementation when a PCOM is in his/her first term. The Figure shows the standard deviation, a measure of uncertainty, in predictability between new and old provincial leaders. As the graph shows, variance among firms within the province-industry dyad on questions gauging predictability is significantly higher for new leaders. This indicates that there is much less certainty about how policy will be created and implemented under new leaders.

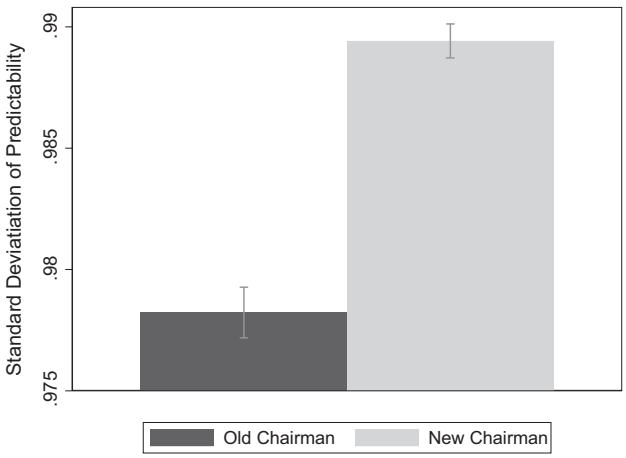

Fig. 3. Relationship between Predictability and Tenure of Provincial Leader. Old Chairmen indicates People's Committee Chair in his/her second term. New Chair indicates first term. Range bars depict 95% Confidence Intervals. The dependent variable is the standard deviation of policy predictability at the provincial level for each provincial-sector dyad. The question read, "How predictable is implementation of central laws and regulations at the provincial level?" Values included: 1) Never; 2) Seldom; 3) Sometimes; 4) Often; 5) Always.

3.3. Analysis

To test Hypotheses 1a and 1b, we use ordinary least squares (OLS) regression specified in estimating equation 1.[14] The dependent variable is the ratio of total bribe payments to revenue and is measured at the firm level (i). When *CC* equals one, this implies *closed competition* corruption as defined above, and is therefore measured at the (province-industry level (p-s) for each time-period (t)). When *CC* equals 0, we characterize the corruption type as *open competition*. *Norm* is the industry-province corruption norm, the share of firms in each province-industry dyad describing bribe payments as normal. *Norm* is also measured at the p-s level. The critical term in our analysis is β_3, which is the multiplicative interaction term between *CC* and *Norm*. We expect a negative coefficient, as our H1b proposes that the size of bribe payments of CC firms should decline when corruption norms are high, because heavy competition reduces the available rents in the sector, and therefore reduces the attractiveness to the collusive briber.

In the naïve models, we control for the employment size of the firm at the time of establishments, as Bai et al. (2017) have shown that variable to be influential in determining bribe size in work on Vietnam, and also control for firm age under the theory that firms established a long time ago have a greater understanding of government actors and institutions, and therefore are able to reduce their bribes over time. Relatedly, age helps address survivor bias in that older firms have survived a vetting process and are therefore more likely to be productive and successful. Standard errors are clustered at the province-industry level (p-s), because this is the level at which our two treatment variables *CC* and *Norm* are measured. We introduce survey-year fixed effects, denoted by (λ) to address idiosyncratic shocks in a given year from the real world or survey administration, as well as to address potential trending in bribery behavior over time that might associated with our firm-level measures. Observations are indexed by time (t), province (p), two-digit sector (s), and firm (i).

$$1)\ Bribe_i = \beta_0 + \beta_1 CC_{p,s,t} + \beta_2 Norm_{p,s,t} + \beta_3 CC_{p,s,t} * Norm_{p,s,t} + \beta_4 Size_{i,t} + \beta_5 Age_{i,t} + \lambda_t + \varepsilon_{i,p,s}$$

A key concern for our research design is potential omitted variable bias or unobserved heterogeneity. Firms in *open-* and *closed-competition* environments may differ in a number of other ways that might be correlated with increased bribe payments. This might include relationships with government officials, business experience, interactions with different types of clients and supplies, etc. The top panel of Table 3 studies how the descriptive statistics of a number of potential confounders vary between types of corruption. These statistics illustrate that the threat does not appear to be severe. Nevertheless, there are a few areas of concern. Firms characterized as operating in *open competition* environments are more likely to do business with state agencies or state-owned enterprises (SOEs) and are slightly more likely to be run by former

[13] See Appendix D for balance tests.

[14] Our results are substantively similar when we use ordered probit analysis, but we find the interpretation of interaction effects to be more straightforward with OLS, because the share of bribes over revenue can be read directly off the regression coefficient Moreover, OLS is less prone to bias in the presence of fixed effects. For robustness tests using oprobit on the eight-point corruption scale, please see Appendix A.

Table 3
Matching Rent-Seeking and Facilitative Firms on Covariates.

Variables	1. Before Balancing					
	Closed Competition			Open Competition		
	Mean	Variance	Skew	Mean	Variance	Skew
Survey Year	2012	11.63	−0.10	2012	11.71	−0.07
Legal Form of Firm	2.28	1.18	0.32	2.37	1.09	0.15
Employees at Establishment (1–8)	2.19	1.31	1.18	2.14	1.05	1.00
Capital at Establishment (1–8)	2.46	1.53	0.76	2.44	1.26	0.61
Sales to SOE (%)	22.9%	17.7%	1.29	27.3%	19.9%	1.02
Sales to Domestic Individuals or Firms (%)	71.9%	20.2%	−0.97	67.4%	22.0%	−0.74
Sales to Foreign Individuals or Firms (%)	10.1%	9.1%	2.65	9.2%	8.3%	2.83
Exports Directly (%)	7.3%	6.8%	3.29	5.1%	4.9%	4.07
Exports Indirectly (%)	5.3%	5.0%	4.01	3.8%	3.6%	4.86
Former Local SOE = 1	5.3%	5.0%	4.01	4.8%	4.6%	4.24
Former Central SOE = 1	1.0%	1.0%	9.61	0.8%	0.8%	11.25
Firm owner is former government = 1	3.4%	3.3%	5.14	3.5%	3.4%	5.07
Firm owner is former military = 1	9.8%	8.9%	2.70	9.7%	8.8%	2.72
Firm owner former SOE manager = 1	12.4%	10.9%	2.29	13.7%	11.9%	2.11
Firm owner former SOE employee = 1	17.4%	14.3%	1.72	16.6%	13.9%	1.79
Firm posseses land use rights certificate	41.5%	24.3%	0.34	37.4%	23.4%	0.52
Variables	2. After Balancing					
	Closed Competition			Open Competition		
	Mean	Variance	Skew	Mean	Variance	Skew
Survey Year	2012	11.63	−0.10	2012	11.61	−0.07
Legal Form of Firm	2.28	1.18	0.32	2.28	1.08	0.23
Employees at Establishment (1–8)	2.19	1.31	1.18	2.19	1.14	1.11
Capital at Establishment (1–8)	2.46	1.53	0.76	2.46	1.32	0.65
Sales to SOE (%)	22.9%	17.7%	1.29	23.0%	17.7%	1.29
Sales to Domestic Individuals or Firms (%)	71.9%	20.2%	−0.97	71.8%	20.2%	−0.97
Sales to Foreign Individuals or Firms (%)	10.1%	9.1%	2.65	10.1%	9.0%	2.66
Exports Directly (%)	7.3%	6.8%	3.29	7.3%	6.7%	3.29
Exports Indirectly (%)	5.3%	5.0%	4.01	5.2%	5.0%	4.01
Former Local SOE = 1	5.3%	5.0%	4.01	5.3%	5.0%	4.01
Former Central SOE = 1	1.0%	1.0%	9.61	1.0%	1.0%	9.62
Firm owner is former government = 1	3.4%	3.3%	5.14	3.4%	3.3%	5.14
Firm owner is former military = 1	9.8%	8.9%	2.70	9.8%	8.9%	2.70
Firm owner former SOE manager = 1	12.4%	10.9%	2.29	12.4%	10.9%	2.28
Firm owner former SOE employee = 1	17.4%	14.3%	1.72	17.3%	14.3%	1.73
Firm posseses land use rights certificate	41.5%	24.3%	0.34	41.5%	24.3%	0.34

This table describe the Entropy Balancing Procedure (Ebalance, Hainmueller, 2012) to address observed differences between firms that provided comments and those that did not. The first panel shows mean, variance, and skew between commenting firms and control firms before balancing. The second panel shows the same statistics afterwards. The second panel demonsrtates much more balance on confounders. *Source:* Authors' estimated results based on PCI and enterprise survey (GSO) datasets.

SOE managers, implying they have more connections to decision makers. *Closed-competition* firms are also significantly more likely to possess land titles and therefore have more secure property rights.

While not the experimental ideal, matching techniques have been proposed as one possible remedy to this selection problem (Dehejia & Wahba, 2002). In this section, we employ a type of matching suggested by Hainmueller (2012) called entropy balancing (*Ebalance*). *Ebalance* is a non-parametric approach that reweights observations to statistically generate a region of common support where commenting and non-commenting are comparable on structural covariates. Ebalance does this directly by incorporating covariate balance into the weight function that is applied to the sample units. Ebalance has been proven doubly robust with respect to linear outcome regression and logistic propensity score regression, and is thought to be an appealing alternative to conventional matching estimators that rely on maximum likelihood assumption (Zhao & Percival, 2017). Diaz and Kelly observe that "Covariate balancing methods outperform all other methods—including a correct logistic regression model—when the correct covariates are observed," (Diaz & Kelley, 2016).

To apply this technique, we impose a set of balance constraints, which imply that the covariate distributions of the treatment and control groups in the preprocessed data match exactly on all pre-specified observations. We take care to use only pre-treatment variables in the balancing equation. The entropy balancing algorithm then searches for the set of weights that satisfies the balance constraints but remains as close as possible to a set of uniform base weights to retain information. This recalibration technique assures maximum balance between the treatment and control groups (Hainmueller, 2012). After reweighting, open-competition and closed-competition firms match directly in terms of average value, variation, and skew (see the bottom panel of Table 3). Another assumption of the technique is that, if the region of common support is large enough, our balancing on observable confounders reduces potential biases caused by unobservable confounders. Of course, balance on unobservables can never be fully verified.

4. Results

4.1. Descriptive statistics

Table 4 provides descriptive statistics and bivariate correlations of key variables of interests in the regression analysis. The mean annual *bribe payment* between 2006 and 2017 is about 2.99 percent of revenue, but this varies considerably by firms, as can be seen by the standard deviation of 4.84 (Aterido, Hallward-

Table 4
Descriptive Statistics.

Summary Statistics						
Variable		N	Mean	Std. Dev.	Min	Max
1	Bribes/Revenue (%)	74,231	2.99	4.84	0	25
2	Service Delivered = 1	68,517	3.57	0.92	1	5
3	Know Bribe Size = 1	5,758	2.94	1.30	1	5
4	Inspection Bribes Norma1	16,237	0.22	0.42	0	1
5	Closed Competition = 1	93,995	0.42	0.49	0	1
6	Industry-Province Corruption Norm	83,667	0.61	0.13	0	1
7	First Tem of People's Committte-Chair = 1	90,682	0.71	0.45	0	1
8	Number of Employees at Start (1–8)	84,597	2.16	1.08	1	8
9	Age of Firm	90,775	6.50	6.03	0	106
10	Number of Administrative Units (ln)	93,660	5.18	0.52	4.16	6.50

Bivariate Correlations											
Variable		1	2	3	4	5	6	7	8	9	10
1	Bribes/Revenue (%)	1									
2	Service Delivered = 1	0.0949*	1								
3	Know Bribe Size = 1	0.2112*	0.3308*	1							
4	Inspection Bribes Norma1	0.2532*	0.0895*	0.1396*	1						
5	Closed Competition = 1	−0.0668*	−0.0069	−0.022	0.0215*	1					
6	Industry-Province Corruption Norm	0.1613*	0.0744*	0.1171*	0.1148*	0.0161*	1				
7	First Tem of People's Committte-Chair = 1	−0.0284*	−0.0229*	−0.0023	−0.0173*	−0.0041	−0.0501*	1			
8	Number of Employees at Start (1–8)	−0.0433*	0.0078	−0.0253	0.0157	0.0280*	0.0948*	0.0416*	1		
9	Age of Firm	−0.0201*	0.0145*	−0.0276*	0.0598*	0.0598*	−0.0302*	−0.0298*	0.1838*	1	
10	Number of Administrative Units (ln)	0.0210*	0.0283*	0.0300*	0.0290*	0.0416*	0.3164*	−0.1534*	0.0461*	0.0122*	1

Summarized from PCI and enterprise survey (GSO) datasets. * Significant at the 0.05 level.

Driemeier, & Pagés, 2009).[15] The minimum *bribe payment* in the PCI sample is zero percent (about 22 percent of respondents) and the maximum is equal to 25 percent (about 3 percent of respondents). On average, 61 percent of the firms in the cluster of industry-province believe "informal payments,"[16] the well-known Vietnamese euphemism for bribery, are common. About 42 percent of the firms operate in *closed-competition* environments (*CC* = 1), and pay both non-collusive and collusive, and the remaining firms belong to *open-competition* environments (*CC* = 0), paying predominantly non-collusive bribes. A little over 71 percent of firms operate in provinces where People's Chairmen are in their first term (actually, first year) in office, and therefore face unpredictable policy environments.

4.2. Testing of hypothesis 1a and 1b.

Table 5 presents the estimated results on the nexus between *Norm* and annual *Bribe Size*. Model 1 presents the unadjusted interaction between corruption norms and competition type (*CC*), Model 2 controls for the key covariates of logged employment size, and years since establishment (age). Model 3 uses the *Ebalance* technique to address potential biases caused by omitted confounders at the firm level. Our preferred specification, Model 4, controls for government size, operationalized by the number of administrative units within the province, thereby capturing the number of bureaucrats on the provincial payroll and consequently the number of opportunities for bureaucratic corruption. This model is important because it addresses differences in government size across Vietnamese provinces, which has been shown to be a critical determinant of bribe opportunities and therefore propensity (Dimant & Tosato, 2018; Goel, Budak, & Rajh, 2012; Rose-Ackerman, 1978). Coefficient sizes and standard errors are reasonably similar across models.

The next two models offer robustness checks to test whether our findings hold within individual provinces and sectors. These models are fundamentally different from our preferred specifications, because they remove the cross-sectional variation in our treatment variable, however, they are important because the focus attention on changes in the treatment variable over time. Model 5 uses the *Ebalance* approach with provincial fixed effects, thereby isolating changing corruption norms within particular provinces. By introducing provincial dummies, we compare firms to other firms within the same provinces, allowing us to hold the impact of provincial socio-economic factors constant to focus on firm level factors. Finally, Model 6 provides the most rigorous specification of all, using *Ebalance* and including year, province, and sector fixed effects. This specification allows us to isolate the effect of changing corruption norms over time, holding constant features of the province and sector in which the firm operates. The substantive effect of Model 6 is expected to be smaller because it is only capturing longitudinal variation in *Norm* and *Closed-Competition*.

Focusing on our preferred Model 4, which allows for both cross-sectional and longitudinal variation, we find evidence consistent with our theory. The first row tells us that when the *Norm* is equal to zero, firms in *closed competition* take advantage of the limited competition to pay about 1.2 percentage points more in bribes as a share of revenue. Consistent with H1a, we find in row 2 that when a firm is characterized as engaging in *open competition* (*CC* = 0), increases in *Norm* leads to more sizable bribe payments. A movement from 0% of competitors paying to 100% of competitors paying is associated with 5.87 percentage points in greater bribe payments as a share of revenue.

Finally, row 3 provides the coefficient (β_3) on the interaction term of *CC* and *Norm*. Consistent with H1b, we observe a significant and sizeable coefficient of −2.86, implying the relationship between social norms and corruption is much steeper under condi-

[15] While 2.99% of sales revenue may seem small in isolation it is actually quite a substantial expense. It is roughly 1/3 of the official VAT, which is 10% of sales. To put this in comparative perspective, Atierdo et al. 2009 using the same exact question for 56,000 firms in 90 countries describe an average bribe payment of 1.5% of sales (SD=4.2). That means that Vietnamese firms pay 0.24 standard deviations more than the average firm in the World Bank sample of all countries in the world.

[16] *Chi phi khong chinh thuc*

Table 5
Relationship Between Norms and Severity of Corruption.

Dependent Variable: Bribes/Revenue (%)	Main Specifications				Robustness Checks	
	(1) Baseline	(2) Controls	(3) Ebalance	(4) Ebalance	(5) Ebalance	(6) Ebalance
Closed Competition = 1	1.303***	1.426***	1.181***	1.192***	1.162***	0.511**
	(0.284)	(0.296)	(0.275)	(0.276)	(0.257)	(0.202)
Industry-Province Corruption Norm	6.028***	6.363***	5.771***	5.870***	4.944***	1.505***
	(0.470)	(0.498)	(0.439)	(0.446)	(0.457)	(0.279)
Closed Competition*Corruption Norm	−3.207***	−3.399***	−2.846***	−2.857***	−2.707***	−1.042***
	(0.504)	(0.522)	(0.485)	(0.486)	(0.453)	(0.345)
Labor Size at Establishment (1–8)		−0.154***				
		(0.021)				
Age of Firm		−0.016***				
		(0.004)				
Number of Administrative Units (ln)				−0.068	0.050	−0.384
				(0.084)	(1.127)	(0.983)
Constant	−0.392	−0.143	−0.313	−0.022	−0.516	3.359
	(0.255)	(0.264)	(0.239)	(0.457)	(5.844)	(5.113)
Survey Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	No	No	No	No	Yes	Yes
Two-Digit Sector Fixed Effects	No	No	No	No	No	Yes
Observations	72,260	64,643	64,503	64,480	64,480	64,480
Clusters	2554	2534	2531	2522	2522	2522
R-Squared	0.036	0.040	0.034	0.034	0.044	0.087
RMSE	4.774	4.779	4.665	4.665	4.645	4.541

OLS with robust standard errors, clustered at province-industry level, in parentheses (*** p < 0.01, ** p < 0.05, * p < 0.1). Models 3–6 employ Ebalance to match types of corruption on observables. *Source:* Authors' estimated results based on PCI and enterprise survey (GSO) datasets.

tions of *open-competition*. Fig. 4 probes the substantive effects of this interaction effect by plotting the two lines implied by the interaction. The dark gray and light gray lines plot the predicted bribe size at different levels of corruption norms for firms in *open-competition* (*CC* = 0) and *closed-competition* environments (*CC* = 1) respectively. The range bars represent the 95% confidence intervals around the estimated bribes sizes. Finally, the histograms at the bottom of the graph depict the distribution of observations for both types of observations over different values of corruption norms, the moderating variable. We can see from the histograms that the interaction fulfills the traditional assumptions of the linear interaction. The distributions are normally distributed, cover close to the range of the interaction term, and there is common support, sufficient numbers of both *open competition* and *closed-competition* observations at different values of the moderating variable (Xu, Hainmueller, Mummolo, and Liu, 2017).[17]

As is clear in the regression table, the dark gray line for *open competition* is positive and steep, crossing 4% of revenue at the highest observed level of corruption norms. However, the light gray line for *closed competition* firms is significantly less steep. As the number of bribe-paying firms increase, the rents available from bribing an official decline, and collusive bribers correspondingly lower the amount that they are willing to pay in bribes. Above 49 percent of firms paying bribes, the size of bribe payments by firms in different competition environments significantly diverge. At the highest level of social norms, firms in *closed competition* pay bribes equivalent to 3.8 percent of revenue (a 27 percent increase above the sample mean of 2.99), however, firms in *open competition* pay bribes equivalent to 5.5 percent of revenue (an 84 percent increase over the sample mean). Although, as our theory predicts, the estimated bribe payments for *closed competition* firms are actually higher when *Norm* is low (i.e. <40% of firms in the province-industry dyad). At the 25th percentile of social norms, bribery under *closed competition* is equivalent to 1.54 percent of revenue versus 1.03 percent for firms in *open competition*. This is because *closed competition* firms prefer to pay collusive bribes when they have less competitors, where bribes present them with a competitive advantage.

[17] Results are robust to using the STATA Interflex command recommended by Hainmueller et al. 2017. See Appendix E.

4.3. Placebo tests

While the results depicted in Fig. 4 are compelling, an important concern remains that we may be introducing bias due to our arbitrary choice of 30 days to assign firms to competition environments. Other cutoffs may have delivered substantively different results. We address this concern in Fig. 5 with a placebo test, where we try re-run our most rigorous specification (Table 5, Model 4) with differing cut-off assignments for generating the measure of *closed-competition* environments, ranging from 10 to 50 days for business registration. The range bars depict the 95% Confidence Intervals for the interaction term (β_3) for each cut-off. The graph shows that the negative marginal effect would be similar and statistically significant for any cut-off ranging from 20 days to 50. Remember, 20 is the bottom of the range that the World Bank described as normal business registration waiting periods for Vietnam, while 37 was the maximum. Below 20 days, we no longer see significant effects, which is consistent with our theory. These province-industry dyads are less restricted and there is little benefit to extra payments. These placebo tests confirm that we could have chosen a wide spectrum of possible cut-off decisions and received substantively similar results. Our results are in no way wedded the arbitrary thirty-day threshold.

4.4. Exploring further observational implications of the theory

Our theory presents us with a number of observable implications beyond the regression analysis depicted in Table 5. As we highlighted in Table 1, in environments where the social norm explanation for corruption prevails, non-collusive corruption should be more common. Non-collusive corruption in *open-competition* environments has a number of distinguishing characteristics. First, because it is a social norm, it should be more likely to be seen by firms as a normal part of doing business. Second, because non-collusive corruption is more widespread and transactional, firms are more likely to know the size of the bribe

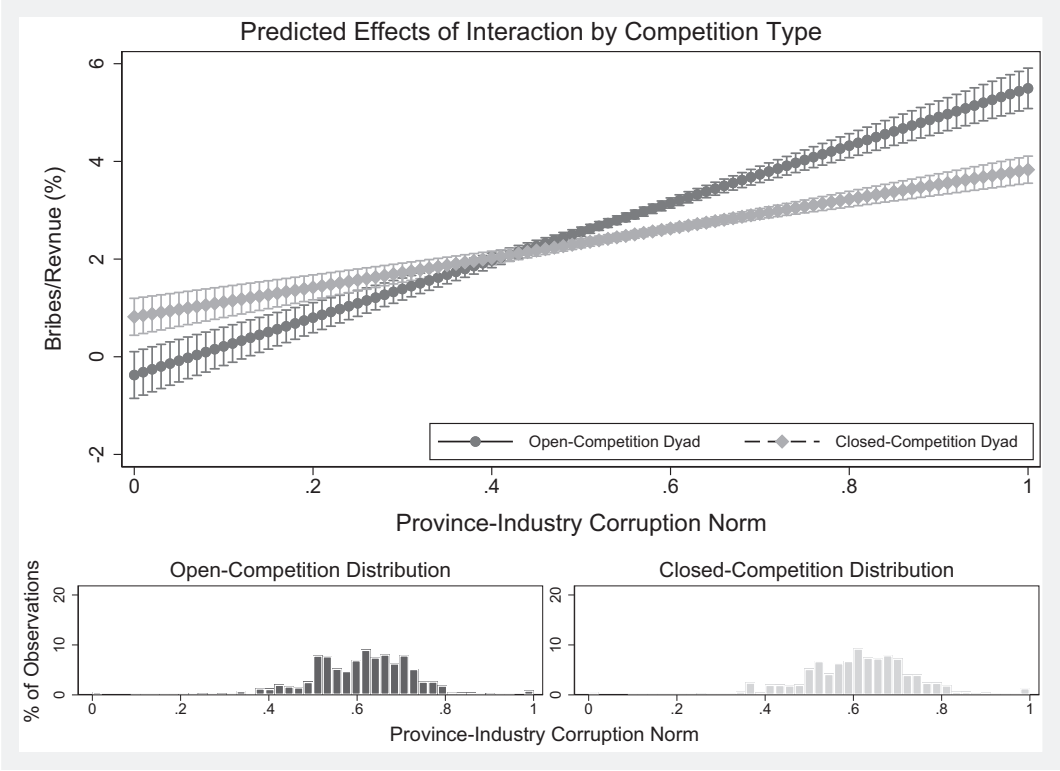

Fig. 4. Illustration of How Competition Type Conditions the Relationship between Norms and Bribe Payments. The top panel depicts the two lines generated by the regression in the full-specified Model 4 of Table 6. Range bars depict 95% Confidence Intervals. The bottom panel depicts the distributions of observations of competition types over the range of the moderating variable. The graph shows that as province-industry corruption norms increase, the share of bribes over revenue paid by firms in open competition environments increases faster than those for firms in closed-competition environments. Above 49 percent of firms paying bribes, the size of bribe payments by firms in different competition environments significantly diverge.

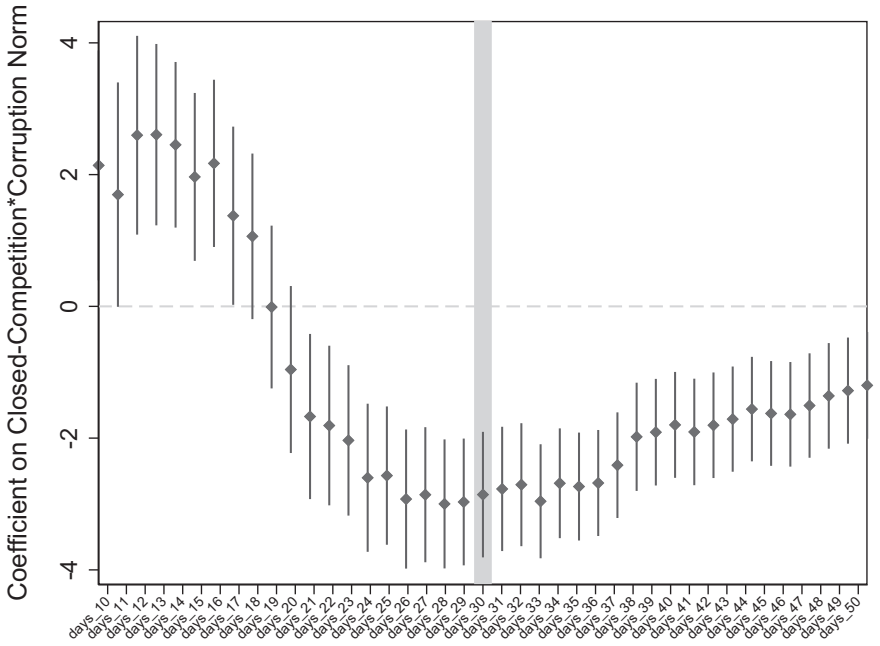

Fig. 5. Placebo Test of Cutoff between Corruption Types. This graph replicates the Model 4 of Table 5 multiple times, each time assigning a different cutoff of waiting periods for registration to delineate *open-* and *closed-competition* province-industry dyads. Gray diamonds represent the coefficient on the interaction between norms and rent-seeking corruption, representing the change in slope between types of firms. Range bars represent 95% CIs. The gray shadow demarks the original distinction of 30 days. Noticeably, the interaction term is significant and similarly sized between 20 and 50 days, indicating that our results are not an artefact of our cutoff selection.

in advance, and can therefore build it into their business plans. Third, because firms are paying for services that are due to them, rather than special access, the bribe payment is more likely to lead to successful acquisition of the service.

Table 6
Validity Test: Direct Measures of Corruption Norms.

Dependent Variable	Service Delivered			Know Bribe Size			Inspection Bribe Normal		
	(1) Baseline	(2) Controls	(3) Ebalance	(4) Baseline	(5) Controls	(6) Ebalance	(7) Baseline	(8) Controls	(9) Ebalance
Closed Competition = 1	−0.004	0.001	0.020	0.479***	0.467***	0.483**	0.069	0.083	0.082
	(0.044)	(0.042)	(0.045)	(0.169)	(0.173)	(0.188)	(0.065)	(0.067)	(0.068)
Industry-Province Corruption Norm	0.380***	0.324***	0.372***	1.245***	1.195***	1.201***	0.297***	0.290***	0.277***
	(0.046)	(0.048)	(0.050)	(0.179)	(0.188)	(0.203)	(0.069)	(0.074)	(0.074)
Closed Competition*Corruption Norm	−0.000	−0.004	−0.042	−0.896***	−0.863***	−0.910***	−0.116	−0.133	−0.135
	(0.069)	(0.067)	(0.070)	(0.269)	(0.275)	(0.297)	(0.102)	(0.106)	(0.106)
Labor Size at Establishment (1–8)		0.026***			0.011			0.001	
		(0.004)			(0.017)			(0.006)	
Age of Firm		−0.002***			−0.006*			0.003***	
		(0.001)			(0.003)			(0.001)	
Number of Administrative Units (ln)		0.022**	0.026***		0.036	0.062*		0.021	0.027**
		(0.010)	(0.010)		(0.033)	(0.036)		(0.013)	(0.013)
Constant	3.344***	3.216***	3.223***	2.215***	2.083***	1.931***	0.370***	0.239***	0.250***
	(0.029)	(0.052)	(0.051)	(0.110)	(0.191)	(0.201)	(0.042)	(0.071)	(0.070)
Survey Year Fixed Effects	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Observations	66,830	61,691	59,631	5,635	5,360	5,049	6,351	5,975	5,813
Clusters	2547	2521	2505	1445	1415	1374	1461	1419	1403
R-Squared	0.018	0.020	0.019	0.010	0.011	0.010	0.007	0.010	0.008
RMSE	0.906	0.895	0.895	1.294	1.292	1.298	0.496	0.494	0.495
Marginal Effect at Mean of Norm = 0.61	−0.004	−0.001	−0.004	0.06*	0.05	0.06*	−0.001	−0.003	0.001
Marginal Effect at Mean + 2SD of Norm = 0.86	0.004	0.002	0.015	0.29***	0.27***	0.300***	0.031	0.032	0.034

OLS with robust standard errors, clustered at province-industry level, in parentheses (*** p < 0.01, ** p < 0.05, * p < 0.1). Models 2, 4, and 6 employ Ebalance to match types of corruption on observables. *Source:* Authors' estimated results based on PCI and enterprise survey (GSO) datasets.

We test these three additional observable implications of our theory with three additional PCI questions. Two of these questions were added at our request to the PCI survey in 2016 and 2017, but do not exist in prior iterations and therefore cannot be employed in the full analysis (Malesky, 2017; Malesky, Phan, & Pham, 2018). The third question can be traced back to 2006. These questions are listed at the bottom of Table 2. First, we employed a question used in all iterations of the survey, asking whether bribe payers received the service for which they illicitly paid. *Service Delivered* was scored on a five-point scale, ranging from never (1) to always (5). The second characteristic was whether firms knew the size of the payment in advance. If a firm admitted to bribing an official, we asked whether the price was known. This variable, *Know Bribe Size,* was scored on the same five-point scale. The final question was a follow-up to a question on bribes during regulatory inspections, a common activity that nearly all firms face. If a firm admitted to making a payment to a regulator, the PCI survey asked who initiated the payment: the firm (16% of respondents), the examiner (2%), or was no request made, because the activity was known and expected by both parties (22%). We coded firms answering the third option as one and those answering the other two options as zero on the dependent variable *Inspection Bribes Normal.*

For consistency, we use the same econometric specification spelled out in equation 1 (and implemented in Table 5, Model 4), employing OLS and standard errors clustered at the provincial-sector level. These results are presented in Table 6. For each outcome variable, we provide three models. Model 1 is a baseline model with only the interaction equation and survey-year fixed effects. Model 2 controls for employment size and province administrative size. Finally, Model 3 provides the rigorous approach that accounts for omitted variable bias using *Ebalance* to hold constant a wide range of potential confounders.

The significant and sizable component effect of *Norms* is in row 2 is consistent with our expectations in H1a that social norms are associated with greater prevalence of non-collusive corruption. Looking at the full specification in Models 3, 6, and 9, if corruption norms increase, all firms are significantly more likely to say the service was delivered, inspection bribes are normal, and know the bribe price.

We also find suggestive evidence for H1b that the increase in non-collusive bribery due to social norms is greater in the presence of *open competition* than *closed competition*. In all specifications, the interaction term is negatively signed, indicating that slope is flatter in *closed competition* dyads. However, the interaction term is only significantly different from zero in the case of whether firms know the bribe price. To put this finding in perspective, we calculate the marginal effect (the difference between closed and open competition) at the mean province-industry corruption norm (0.60) and two standard deviations above the mean (0.86) in the bottom two rows of Table 6. When 60% of firms in a dyad are paying bribes, there is only −0.06 point (on a five-point scale difference) in whether firms in closed competition dyads know the price. However, at two standard deviations above the mean in social norms, the difference is −0.30 points, five times as much and equal to about a quarter of a standard deviation. Thus, we can conclude that as social norms increase, firms in open competition environments are much more likely to be able to predict the size of their bribe payments.

4.5. Testing the relationship with predictability (Hypothesis 2)

To test H2 regarding the conditional effects predictability we use a similar linear specification with entropy balancing as above with two alterations. This time, we interact CC with whether or not a province has a *PCOM* serving in his/her first term (*PCOM* = 1). Given, the importance of *Norms* above, we control for them in the fully specified model by also interacting them with *CC*. To remain as consistent and conservative as above, we begin with the fully-specified specification in Model 4 of Table 5 that included year (λ) fixed effects and measures of administration size. However, this test has the additional concern of unobserved heterogeneity at the provincial level that might be associated with the type of leader. That is, particular leaders may have characteristics that led to their assignment to specific provinces and management of specific sectors. To address these concerns, we add province (Π) and two-digit sector (η) fixed effects to our preferred specification. Again, we cluster standard errors at the province-industry level, which is the level of our treatment variable, and employ *Ebalance* to generate comparable groups of collusive and non-collusive bribers.

Table 7
Relationship between Predictability and Severity of Corruption.

Dependent Variable: Bribes/Revenue (%)	Using Entropy Balancing			
	(1) Baseline	(2) Corruption Norms	(3) Chairmen Controls	(4) Chairmen FE
Closed Competition = 1	−0.153	0.742***	0.819***	0.704***
	(0.104)	(0.230)	(0.278)	(0.230)
New People's Committee Chairman==1	−0.074	−0.058	−0.060	−0.113
	(0.066)	(0.065)	(0.081)	(0.096)
Closed Competition*New Chairman	0.261***	0.224**	0.238**	0.248***
	(0.098)	(0.096)	(0.110)	(0.095)
Industry-Province Corruption Norm		3.954***	4.256***	3.929***
		(0.301)	(0.363)	(0.301)
Closed Competition*Corruption Norm		−1.583***	−1.749***	−1.552***
		(0.379)	(0.458)	(0.379)
Education Level of Chairman			0.037	
			(0.035)	
Age of Chairman			0.007	
			(0.013)	
Chairman Serving in Hometown			0.093	
			(0.114)	
Number of Administrative Units (ln)			−0.541	−1.149
			(1.079)	(1.335)
Constant	2.223***	−0.094	2.150	5.986
	(0.135)	(0.212)	(5.703)	(6.939)
Survey Year Fixed Effects	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes
Two-Digit Sector Fixed Effects	Yes	Yes	Yes	Yes
Chairman Fixed Effects	No	Yes	No	Yes
Observations	63,786	63,585	52,435	63,585
Clusters	2690	2493	2419	2493
R-Squared	0.075	0.079	0.081	0.083
RMSE	4.381	4.374	4.536	4.369

OLS with robust standard errors, clustered at province-industry level, in parentheses (*** p < 0.01, ** p < 0.05, * p < 0.1). All models employ Ebalance to match types of corruption on observables. *Source:* Authors' estimated results based on PCI and enterprise survey (GSO) datasets.

Observations are again indexed by time (t), province (p), two-digit sector (s), and firm (i). [18]

$$2)\ Bribe_i = \beta_0 + \beta_1 CC_{p,s,t} + \beta_2 NewPCOM_{p,t} + \beta_3 CC_{p,s,t} * NewPCOM_{p,t} + \beta_4 Norm_{p,s,t} + \beta_3 CC_{p,s,t} * Norm_{p,s,t} + \lambda_t + \pi_p + \eta_s + \varepsilon_{i,p,s,t}$$

Table 7 presents the multiple regression results. Model 1 uses the baseline specification. Model 2 adds the multiplicative interaction of CC and *Norm* to control for corruption norms at the province-sector level. Model 3 controls for the age, education, whether the PCOM was born in the the province s/he serves. Finally, Model 4 provides the most rigorous specification of all with PCOM fixed effects, so that the relevant comparison is of the impact of corruption of the first and second term of the same exact same PCOM.

Table 7 does not provide support for H2a that decreasing predictability increases bribery generally. However, we do find strong support for H2b that predictability increases bribery dramatically in the specific context of *closed-competition*. We can see this even more clearly in Fig. 6, which presents the marginal effects from the interaction term for *open-* and *closed-competition firms.* When a province switches from an old to a new PCOM, *closed-competition* firms significantly increase their bribe/revenue by 0.20%, shifting from 2.86% to 3.06% of revenue. By contrast, *open-competition* firms that experience the same increase in uncertainty actually decrease their bribe payments from 3.18% to 3.0% of revenue, although this change is not significantly different from zero.

It is clear that uncertainty (in the form of a new PCOM) increases the benefits of collusive corruption in *closed-competition* environments, which in turn leads to an increase in their willingness to expend resources on bribery. By contrast, uncertainty does not appear to be significantly correlated with non-collusive corruption in *open competition* environments, as firms see bribery as the tax they need to pay to get things done.

5. Discussion

Do social norms of corruption and policy uncertainty influence firm bribery? Our answer is "It depends on level of market competition" based on data from a sample of firms in Vietnam. We have demonstrated that social norms of corruption are positively related to a firm's bribe payment, and that relationship is strengthened by level of market competition. By contrast, policy uncertainty has a positive association with firm bribery only in closed market competition.

Readers should be cautious of two limitations of this research. First, while we were able to demonstrate that a firm's ability to predict policy changes depends on many factors other than their bribe payment, the potential endogeneity problem between a firms' bribery and policy predictability is substantially limited by

[18] We also run all analyses using the eight-point scale using an ordinal probit set-up as well, and receive similar results. See Appendix B for details.

Fig. 6. Illustration of How Competition Type Conditions the Relationship between Predictability and Bribe Payments. The Fig. depicts the marginal effects generated by the regression in the full-specified Model 3 of Table 7. Range bars depict 95% Confidence Intervals. The graph depicts the change in bribery levels when provinces switch from an old chairman to a new one. Firms in *closed-competition* environments significantly increase their bribery, while a new chairman has no effect on bribery among non-collusive firms. e of bribe payments by firms in different competition environments significantly diverge.

the assignment of leaders, but not completely ruled out. Secondly, our measures of market competition may be endogenous to bribe size if industry regulations were designed with the specific goal of generating rents by increasing the burden of red tape (Bhagwati, 1982). Despite these limitations, we believe that the paper contributes theoretically to the current literature.

5.1. Theoretical implications

This study contributes to the literature by testing the two competing views on firm bribery – rent-seeking versus social norms. To our knowledge, this is the first empirical study that demonstrates how market competition conditions the effects of social norms and policy uncertainty on firm bribery choice. This suggests an important avenue for future studies seeking to explore institutional determinants on firm bribery. Overall, our attempt goes beyond the general statement that institutions matter, specifying how they interact to influence firm bribery (Wright, Filatotchev, Hoskisson, & Peng, 2005). Furthermore, our results point to the indirect role of market competition on firm bribery, such that market competition moderates the effects of social norms of corruption and policy uncertainty on firm bribery. These indirect effects of market competition on firm bribery have been understudied and could be further examined in future research.

Several potential research topics follow from our findings. One question could be whether the social norm and rent-seeking views are more relevant to explain the dynamics of different types of bribery. Our theoretical discussions suggest that the rent-seeking view is more relevant to explain why firms pay collusive bribes (Alexeev & Song, 2013; Diaby & Sylwester, 2015; Shleifer & Vishny, 1993), because this type of bribes is motivated by abnormal rents. Conversely, the social norm perspective may be more relevant to explain why firms pay non-collusive (or coercive) bribes. Uncovering the dynamics of these types of bribes would provide more nuanced implications for policy-making and yet has not been done in empirical studies.

Our study also sheds light onto the question of "how much choice does a firm have in bribery?" The answer depends greatly on the combination of market competition and institutional context. In an open competition setting with high levels of social norms for corruption, firms do not have many options other than to adhere to the "norms" of their social group. In most cases, firms are "forced" to pay this type of bribes. On the contrary, in a context of closed competition and high policy uncertainty, firms have opportunities to make strategic decision to maneuver the "rules." Bribing public officials can be seen as a complement, or even a substitute, strategy for building innovative capacity.

5.2. Policy implications

Our results show that while enhancing market competition may help to reduce some type of bribes, it is not enough to curb corruption. This is because even in open environments, firms may still have to pay bribes following accepted norms. Therefore, it is critical to develop ethical norms in the business environment as those suggesting a collective action model of corruption have advocated (Persson et al., 2013, 2019). On the one hand, continuing public administration reform is imperative, as firms in Vietnam are still subject to complex procedures, harassment, and unreasonable requests from individual public officials (T. V. Nguyen et al., 2016). On the other hand, firms should be encouraged to be more proactive in dealing with non-collusive bribery. Such measures, such as promoting collective action among firms in the same local-industry context and/or supporting firms to develop codes of conduct, should be considered. In countries where corruption is rampant and pervasive, promoting collective stances against corruption is important an first step (Persson et al., 2013, 2019).

Beyond developing integrity norms, addressing collusive bribes has become increasingly important for the country. Scholars and practitioners have pointed out that collusive bribery has become a serious threat to developing countries and particularly Vietnam (De Jong, Tu, & van Ees, 2012; T. T. Nguyen & Van Dijk, 2012;

T. V. Nguyen et al., 2016). These bribes can nullify economic reforms, lead to distorted decisions, and waylay policy implementation. Measures to address collusion between government officials and businesses need to be in place. These include addressing conflict of interests, closely monitoring public procurement and public–private partnership projects, and transparent asset declaration for public officials, among others. Importantly, unnecessary entry barriers should be cleared away.

CRediT authorship contribution statement

Edmund J. Malesky: Methodology, Software, Validation, Investigation, Resources, Writing - original draft, Writing - review & editing. **Thang V. Nguyen:** Conceptualization, Supervision, Project administration, Writing - original draft, Writing - review & editing. **Thang N. Bach:** Investigation, Methodology. **Bao D. Ho:** Investigation, Methodology.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.worlddev.2020.104957.

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