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Greasing the wheels of change: bribery, institutions, and new product introductions in emerging markets

Sorin M.S. Krammer

University of Leeds

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Corresponding author: Sorin M.S. Krammer, Centre for International Business, Leeds University Business School, University of Leeds, Maurice Keyworth Building, Leeds, LS2 9JT, United Kingdom.

Email: M.S.Krammer@leeds.ac.uk

ABSTRACT

Despite the consensus on the negative country-level implications of corruption, its consequences for firms are less understood. This study examines the effect of bribery on the innovative performance of firms in emerging markets, as reflected by new product introductions. I argue that bribery may help innovators in these markets to introduce new products by overcoming bureaucratic obstacles, compensating for the lack of kinship or political affiliations, and hedging against political risk. I also propose that the relationship between firm bribery and new product introduction will be negatively moderated (i.e., weakened) by the quality of the formal and informal institutions in place. Employing data from over 6,000 firms in 30 emerging markets and a wide range of empirical tests, my results support these hypotheses. These findings extend transaction costs economics by showing that bureaucratic obstacles and uncertainty can drive firms into illegal cost minimization strategies. Moreover, they augment institutional theory by expounding upon the ways that norms and informal practices moderate the efficiency of firm strategies in emerging markets.

Keywords: corruption; innovation; institutions; new products; emerging economies;

GREASING THE WHEELS OF CHANGE: BRIBERY, INSTITUTIONS, AND NEW PRODUCT INTRODUCTIONS IN EMERGING MARKETS

"Bureaucrats live for respect. East of the Balkans, that means a bribe."
Michael Westen in the TV-series Burn Notice (IMDb, 2017)

INTRODUCTION

The worldwide monetary effects of corruption are estimated at a staggering US$ 1.5 trillion per year (Kaufman, Kraay, & Mastruzzi, 2009), roughly the size of Australia's gross domestic product (GDP). In emerging markets, corruption remains a ubiquitous feature of doing business (Rose-Ackerman, 1998; Husted, 1999; Cuervo-Cazurra, 2006; Olken, 2009; Jeong & Weiner, 2012), and the use of bribes by both domestic and foreign firms is frequently reported in the press[1]. Although the general consensus is that bribery has negative effects on a country (Mauro, 1995; Cuervo-Cazzura, 2008; Anokhin & Schultze, 2009; Asiedu & Freeman, 2009), its implications for firms are still insufficiently understood (Galang, 2012; Cuervo-Cazurra, 2016). Thus, while prior research has proposed several explanations for why firms engage in bribing (Svensson, 2003; Collins & Uhlenbruck, 2004; Martin, Cullen, Johnson, & Parboteeah, 2007; Spencer & Gomez, 2011), recent scholarly attention has been directed at examining its consequences for firm strategies (Lee & Weng, 2013; Birhanu, Gambardella & Valentini, 2016). In particular, innovating firms in emerging markets face more bribing pressure from corrupt public officials (Ayyagari, Demirguc-Kunt, & Maksimovic, 2014) and often lack proper institutional support for their activities (Kotabe, Jiang, & Murray, 2017). Yet, relatively little is known about the impact of bribery on firm innovation and the institutional

contingencies of this relationship (James, Leiblein, & Lu, 2013; Mueller, Rosenbusch, & Bausch, 2013).

To address these questions, I investigate how bribing affects the innovative performance of firms in emerging markets, as reflected by their new product introductions (Katila & Ahuja, 2002; Bstieler, 2012; Wang & Cheng, 2015). Introduction of new products represents a central aspect of firms' strategy (Nadkarni & Chen, 2014) that provides avenues to diversify and adapt to evolving markets (Schoonhoven, Eisenhardt, & Lyman, 1990) and determines their subsequent survival and success (Banbury & Mitchell, 1995; Chaney & Devinney, 1992). Integrating elements from transaction costs economics (TCE) and institutional theory, I propose that, in emerging markets, bribing will have a positive ("greasing") effect on firms' new product introductions by effectively reducing the transaction costs associated with these activities. In these environments, bribery may help innovators to deal with bureaucratic obstacles (Hadjimanolis, 1999; D'Este, Iammarino, Savona, & von Tunzelmann., 2012), influence public officials' decisions despite lacking favorable kinship or political affiliations (Leff, 1964; Bertrand et al., 2007), and hedge against political risks from adverse regime and legislative changes (Acemoglu & Verdier, 2000; Darendeli & Hill, 2016). Furthermore, I argue that the impact of bribes on new product introductions will be negatively moderated by the quality of existing institutions (de Vaal & Ebben, 2011). Thus, effective regulatory frameworks for controlling corruption (Cuervo-Cazurra, 2008; Frederikson, 2014) and greater levels of societal trust (Hunt, 2004; Uslaner, 2004) will reduce the greasing ability of bribes for product introductions via formal (e.g., scrutiny, penalties, and bureaucrats' ability to organize) and informal mechanisms (e.g., reputation, use of intermediaries, and non-pecuniary interactions).

These hypotheses are tested using data from more than 6,000 firms in 30 emerging markets in Central Asia and Eastern Europe that exhibit substantial heterogeneity in terms of

bribing practices (Uhlenbruck, Rodriguez, Doh, & Eden, 2006), institutional quality (Meyer, Estrin, Bhaumik, & Peng, 2009), and innovative potential (Krammer, 2009). The empirical analysis corrects for the endogeneity of bribing, and undertakes a wide range of robustness checks in terms of estimation techniques, alternate proxies and instruments, and testing of underlying mechanisms. Overall, the results support the idea of a propitious greasing in the case of new product introductions, but one that is contingent on the existing formal and informal settings.

This study contributes to the extant literature in the following ways. First, it expands the growing body of work on the consequences of bribery (Uhlenbruck et al., 2006; Lee & Weng, 2013; Birhanu et al., 2016) by suggesting that bribery can help firms in emerging markets with the introduction of their new products (Li & Atuahene-Gima, 2001; Daneels, 2002). This insight extends TCE theory by identifying several factors (i.e., overcoming bureaucracy, hedging against political risk, and compensating for lack of kinship or political affiliation) that may drive firms to engage in such illegal transaction-cost minimization (Cuervo-Cazurra, 2016). In doing so, this work builds on previous evidence that innovating firms engage disproportionately in bribing activities (Ayyagari et al., 2014) by suggesting that these firms employ bribery to reduce transaction costs in these markets. Moreover, it augments recent evidence on the strategic use of bribes (Iriyama, Kishore, & Talukdar, 2016) in relation to a central ingredient of strategy (i.e., new product introductions), which has direct implications for cash-flows, legitimacy, and market position of firms (Schoonhoven et al., 1990).

Second, this study speaks to the importance of informal institutions in dealing with corruption. While prior work on the role of institutions has focused on formal tensions, such as home-host country legislative differences or the impact of global regulations (Cuervo-Cazzura, 2006; Cuervo-Cazzura, 2008; Spencer & Gomez, 2011), this study implies that informal

institutions are complementary and equally important in inhibiting the efficiency of bribes. This finding advances institutional theory by expounding on the ways that social norms and practices moderate firms' responses (Galang, 2012) and legitimacy (Cuervo-Cazurra, 2016) regarding illegal practices. It also contributes to the TCE tenet by showing that transaction costs experienced are not uniform across all firms. Thus, as scholars theorize TCE, they must also consider the formal and informal contingencies of their research.

Finally, this work advances our understanding of the drivers of successful product strategy. While most research in this area develops micro-specific explanations around the characteristics of products, firms, and technologies (Evanschitzky, Eisend, Calantone, & Jiang, 2012; Nadkarni & Chen, 2014), this study answers recent calls to examine the impact of external environments on new product introductions (Bstieler, 2012), particularly in the context of emerging markets (Story, Boso, & Cadogan, 2015). By showing that the effectiveness of product strategy is moderated by the formal and informal settings in which firms operate, it underscores the complex role of institutions in relation to successful introduction of new products.

THEORY AND HYPOTHESIS DEVELOPMENT

Bribery: Grease or sand to economic activities?

The economic effects of corruption have been a topic of debate for the last 50 years. Defined as an abuse of public power for private gain, corruption includes various actions of public officials to accept, solicit, or extort money for private benefits (Tanzi & Davoodi, 1997). Among the different manifestations of corruption, bribery remains the most common one in practice (Svensson, 2003), usually in the form of small cash payments to low-ranking public officials to influence favorably or speed-up their actions (Uhlenbruck et al., 2006). While scholars agree that the global monetary effects of bribes are significant (Kaufmann et al., 2009),

the question whether such payments are noxious across all economic activities and agents is still debated in the extant literature.

One branch of literature depicts corruption as "sanding" (i.e., obstructing) all economic endeavors through additional costs (Fisman & Svensson, 2007), increased uncertainty (Shleifer & Vishny, 1993), and inefficient public provisions (Rose-Ackerman, 1998). Prior studies support this conjecture and find negative effects on economic growth (Mauro, 1995), productivity (Asiedu & Freeman, 2009; de Rosa, Gooroochurn, & Gorg, 2010), trade (Dutt & Traca, 2010), foreign investments (Cuervo-Cazurra, 2006), entrepreneurship (Anokhin & Schultze, 2009), and social development (Rose-Ackerman, 1998). In contrast, an opposite view in the literature argues for positive effects of corruption, especially in weak institutional settings (Meon & Weill, 2010; de Vaal & Ebben, 2011) where the costs of preventing it usually outweigh the benefits (Acemoglu & Verdier, 2000). According to this view, firms can utilize corruption (e.g., bribes) to overcome government ineffectiveness, excessive bureaucracy, and rigid legislation (Leff, 1964; Huntington, 1968), therefore reducing inefficiency and improving the allocation of resources in these contexts (Nye, 1967; Lien, 1990). Building on these rationales, prior studies have provided empirical evidence for this "greasing" hypothesis in the case of economic growth (Mendez & Sepulveda, 2006), foreign investments (Egger & Winner, 2005), and productivity (Méon & Weill, 2010).

Albeit most studies have focused on the macro (i.e., country-level) effects of corruption, it is unlikely that firms are uniformly affected by this phenomenon (Galang, 2012). When facing rampant corruption, firms often recognize and strategically utilize that state of affairs to influence the decisions of public officials to their advantage (Wade, 1982). Specifically, firms take advantage of such high-risk/high-reward environments (Vial & Hanoteau, 2010; De Jong et al., 2012) by paying larger bribes and virtually ignoring the legal and societal provisions against such practices (Jeong & Weiner, 2012). Moreover, when corrupt practices become

institutionalized in a society, managers are more likely to pursue legitimacy by matching the societal expectations regarding such informal payments (Collins & Uhlenbruck, 2004). Hence, firms' responses to corrupt practices differ significantly across countries, contingent on the existing institutional configurations, both at home and abroad (Spencer & Gomez, 2011).

From this perspective, emerging markets provide a propitious environment for examining firms' responses to corruption (Cuervo-Cazzura, 2016). Defined as economies progressing towards being advanced in terms of their markets, financial systems, and regulations (Mody, 2004), these countries are characterized by cumbersome regulatory business procedures (Meyer et al., 2009) and a high tolerance for corrupt practices (Ufere, Perelli, Boland, & Carlsson, 2012). A study by Transparency International (2012) using executive surveys highlights that emerging markets (e.g., Russia, China, Mexico, Indonesia, or Argentina) are at the forefront of bribing activities. The fact that bribing is a common practice in many of these countries is reflected also by the extent of corruption scandals covered in the press, and the involvement of both domestic and multinational firms in these activities (Spencer & Gomez, 2011; Lee & Weng, 2013). In these markets, government officials have numerous opportunities to misuse their public authority, given the low quality of their legal and judicial systems (Meyer et al., 2009) and the rapid changes in their political and economic systems (Martin et al., 2007). These factors have triggered deep shifts in the regulatory landscape and societal values in these markets, fueling further corrupt practices as a mundane solution for achieving legitimate goals (Asiedu & Freeman, 2009).

Bribery and new product introductions

In today's competitive marketplace, introducing a new product or service is an important strategic choice with clear implications for a firm's performance (Banbury & Mitchell, 1995), survival (Schoonhoven et al., 1990), growth (Danneels, 2002), and technological advancement (Wang & Chen, 2015). Since most innovations do not influence

firm performance until they are actually launched in the market, new products represent an accurate reflection of the commercial value of a firm's innovative activities (Katila & Ahuja, 2002). Subsequently, new product introduction is a common proxy for firms' innovative performance in the literature[2] (Garcia & Calatone, 2002; Becheikh, Landry, & Amara, 2006; Mohnen & Hall, 2013), complementing other, alternative metrics for innovation, such as R&D investments, and scientific publications (Katila & Ahuja, 2002).

Introduction of new products is a risky endeavor given the high failure rates and large amounts of capital involved (Cooper, Edgett, & Kleinschmidt, 2002). While most of the literature focuses on exploring the micro-drivers (i.e., product newness, technological factors, firm characteristics, etc.) of successful new products (Evanschitzky et al., 2012), relatively little is known about the contingent effect of the external environment on their success (Bstieler, 2012). Environments that are perceived by managers to be highly uncertain, due to unpredictability or their inability to understand and adapt to specific contextual changes, will affect negatively new product introductions (Wind & Mahajan, 1997; Li & Atuahene-Gima, 2001). Thus, recent findings in the literature suggest that macro-contextual factors, such as cultural values (Evanschitzky et al., 2012) or institutional settings (Story et al., 2015), should be included in explanations of these product introduction decisions since these factors reflect salient challenges for both firms and managers (Bstieler, 2005). Furthermore, such contingencies have yet to be explored in the literature, particularly in relationship to new product introductions in an international (Lee, Wong, & Calatone, 2011) and emerging market context (Story et al., 2015). Answering these calls, I examine the effects of two salient contextual features of emerging markets (i.e., bribery and institutional quality) on a firm's performance with respect to new product introductions.

To theorize the effects of bribes on a firm's new product introductions, I combine elements from transaction costs economics and institutional theory. On one hand, bribery can

be considered a transaction between two rational and opportunistic parties (i.e., the bribing firm and the corrupt bureaucrat) that results in a service being performed (legally or illegally) or a change in the contingencies (e.g., speed or likelihood of approval) surrounding this service (Husted, 1994). On the other hand, institutional theory stresses the importance of institutional characteristics for firm strategies in emerging economies (Hitt, Hoskisson, Johnson, & Moesel, 1996; Peng, Sunny, Pinkham, & Hao, 2009), including bribing activities (Spencer & Gomez, 2011). Therefore, any examination of firm bribery should incorporate some institutional bearings since they are highly representative of bribing practices and their relative success (de Vaal & Ebben, 2011).

There are several mechanisms through which bribes may facilitate new product introduction in emerging markets. First, bribes present a faster and less uncertain way to deal with bureaucratic obstacles and sub-par public services, thereby reducing the transaction costs associated with the deployment of new products. Many emerging markets have heavily regulated industries with excessive provisions and requirements (Djankov, La Porta, Lopez-de-Silanez, & Shleifer, 2002). As a result, innovating firms in these environments face numerous bureaucratic barriers in the form of approvals, permits, licenses, and certifications (Hadjimanolis, 1999; D'Este et al., 2012) which significantly deter their ability to introduce new products in a timely fashion (Chryssochoidis & Wong, 1998). Furthermore, while firms that do not bribe often face arbitrary penalties (e.g., delays, extra requirements, failures, poor service) imposed by corrupt bureaucrats, firms that pay them obtain approvals and licenses with relative ease (Bertrand et al., 2007; Hunt & Laszlo, 2012). Hence, in corrupt settings, bribery presents "a quicker, and perhaps more effective strategic instrument" (Luo, 2005: 141) through which firms get relief from the bureaucratic strain (Rose-Ackerman, 1998; Martin et al., 2007), and reduce the transaction costs associated with the introduction of their new products (Ahlin & Bose, 2007).

Second, for innovators in emerging markets, bribes provide access to the decision-making process, which otherwise would be restricted to members of certain political and kin networks. The close and longstanding association between economic and political cliques in these countries has resulted in competitive interferences, which confer advantages only to those managers who have the "right" kinship, amity, or political affiliation (Leff, 1964). In turn, unaffiliated innovators are likely to face bureaucratic barriers and arbitrary penalties as a result of ill-conceived and cumbersome regulations (Galang, 2012). These obstacles drain resources and reduce the ability of these firms to successfully meet these regulatory provisions for new product introductions (Chryssochoidis & Wong, 1998). Under these auspices, bribes represent an attractive alternative to cut through the red tape and counteract the negative effects of cronyism, nepotism, and political favoritism (Kasuga, 2013) since they "enable an economic innovator to introduce his innovations before he has had time to establish himself politically" (Leff, 1964: 11).

Third, bribes can help firms to forge strong ties with local bureaucrats, thus allowing firms to carry on their corporate activities, even in the face of major political changes (Darendeli & Hill, 2016). In many emerging markets, the predictability of governments' behavior remains a major concern for firms, given the high frequency of regime changes and the incoherence of legislative efforts over time (Acemoglu & Verdier, 2000). In contrast, bureaucrats appear to be a "more or less stable group […] over decades", a group that outlasts political regimes and is able to shield firms against a wide range of restrictions of regulatory, contractual, or financial nature (Darendeli & Hill, 2016). Introduction of new products is an auspicious conclusion of a long-term and risky process (Katila & Ahuja, 2002) in which innovators must overcome many challenges in terms of research, development, production, and testing before hitting the markets (Danneels, 2002). Given these significant sunk costs, firms seek to avoid costly delays to the deployment of their products (Chryssochoidis & Wong, 1998)

and are willing to pay for insurance (in the form of bribes) against any harmful interference in their operations (Leff, 1964; De Jong et al., 2012). While developing links with the current political elites delivers immediate benefits for firms seeking relief from bureaucracy (Li, Meng, Wang, & Zhou, 2008), in the long term, using bribery as a tool for building ties with bureaucrats provides firms with a more effective and complementary safeguard against future political changes (Darendeli & Hill, 2016) that might affect negatively their new product launches.

In sum, I hypothesize that bribing confers tangible benefits to innovators looking to introduce new products by granting them access to the decision-making process, avoiding costly delays from bureaucratic queues and sub-par public services, and shielding them against political risk, which is endemic in many emerging markets. Hence:

Hypothesis 1: Bribery will have a positive effect on firms' new product introductions in emerging markets.

The role of formal institutions

According to institutional theory, firms need legitimacy (i.e., endorsement by relevant institutional actors) to thrive in different environments (North, 1990). Legitimacy can be acquired by conforming to various institutional pressures (DiMaggio & Powell, 1983): coercive ones (from an established authority), normative ones (from societal values, beliefs, and norms), and mimetic ones (pressure to imitate the behavior of successful peers). Subsequently, the efficiency of various business practices of firms, including the use of bribes (Spencer & Gomez, 2011), is subject to existing institutional pressures in these markets (Hitt et al., 2000; Peng et al., 2009).

The institutional environment can be broadly conceptualized across two dimensions (Meyer et. al., 2009). The formal component of institutions refers to codified rules (laws, regulations, policies) that govern the interactions between different economic agents (North, 1990). Given the multitude of regulatory practices in a country, I focus on one institutional

aspect that is the most salient for bribery—namely, the legislative control of corruption. These laws and regulations are specifically designed to limit the use of public power for private gain, covering a wide range of illegal behavior from "petty" (i.e., frequent small payments for small favors) to "grand" (i.e., large sums of money for lucrative, sizeable projects) corruption cases (Cuervo-Cazurra, 2008; Kaufmann et al., 2009).

I argue that, in countries with weak formal regulatory control of corruption, bribes will be more successful in facilitating the deployment of new products. In these environments, weak regulations confer significant leeway to bureaucrats in the form of rewarding bribing firms with insights into the decision process (Leff, 1964), taking advantage of bureaucratic shortcuts (Kasuga, 2013), and offering autonomy from political interferences (Darendeli & Hill, 2016). Consequently, these advantages will facilitate a speedier, or at least timely, introduction of the firms' new products. Moreover, mimetic pressures from high-performing firms towards their competitors will increase a bribe's ability to deliver the sought-after gains by creating incentives for bureaucrats to organize and coordinate these informal transactions (Blackburn and Forgues-Puccio, 2009). As a result, bribery will become an increasingly efficient alternative for deploying new products vis-à-vis the regular institutional route, which is plagued by bureaucratic obstacles and arbitrary halts (Luo, 2005).

Finally, as bureaucrats become increasingly specialized and proficient in distributing benefits and penalties across firms, bribery will become the norm for efficiently deploying new products in these markets. Therefore, institutions that are weak in their efforts to control corruption will enhance the ability of bribes to function as an efficient grease rather than as a dangerous and illegal practice (Ufere et al., 2012). Under such circumstances, bribes will function as a "tax" on firms' innovative activities, with well-established routines (who to pay, when to pay, what to expect), rates (how much to pay) and organized networks of corrupt bureaucrats that will govern the timely introduction of new products.

In contrast, strong regulatory control of corruption will significantly reduce the ability of bribes to facilitate the introduction of new products since such control intensifies the crackdown on corrupt behavior (Cuervo-Cazurra, 2008). Coercive pressures will deter the ability of bribes to deliver benefits to innovators since public officials will face greater risks of being caught and harsher penalties for engaging in corrupt practices (Galang, 2012). As a result, the more regulatory scrutiny they face, the less proficient these officials will be in assisting bribing firms to cut through red tape, protect against political risk, or influence the decision-making process (Kaufmann et al., 2009). Moreover, in high-quality regulatory environments, innovators will be more likely to develop an internal culture and organizational structure that will discourage bribery in order to avoid negative "legitimacy spillovers" from corruption scandals (Kostova & Zaheer, 1999). In response, mimetic pressures will encourage more firms to denounce these practices for product introductions (Schoonhoven et al., 1990), thus reducing the payoffs and incentives for bureaucrats to collude and organize and effectively diminishing the ability of bribes to deliver the desired outcome (Blackburn & Forgues-Puccio, 2009). As bribes lose their ability to grease new products, the (bribe-free) institutional route becomes the accepted norm for introducing new products. Ultimately, stronger control of corruption allows firms to escape arbitrary regulatory barriers, access relevant information, and avoid any other discriminatory treatment, all without bribery. In this way, the connection between bribery and new product deployment will be weakened under stronger formal institutions. Hence:

Hypothesis 2: The quality of existing formal institutions will moderate negatively (i.e., weaken) *the effect of bribery on firms' new product introductions* in emerging markets.

The role of informal institutions

The second institutional component is represented by informal or "softer" aspects, such as values, beliefs, and social norms that guide firms indirectly on how to pursue their goals (North, 1990). Corruption remains, at least on paper, illegal in all countries. Therefore, informal

institutions can significantly affect the efficiency of such practices, even in the presence of strong regulatory provisions (Ufere et al., 2012). From a multitude of institutional aspects, I focus on the level of societal trust as an informal element that is particularly relevant for bribery, both at the level of firms (Hunt, 2004) and the society as a whole (Uslaner, 2004). Trust is a belief in the honesty, integrity, and reliability of others and thus is an expression of adherence to a moral community, which lays the basis for cooperation between different actors in a society (Uslaner, 2002). Alongside religiosity, trust shapes the underlying culture of a country (Husted, 1999), in turn reducing transaction costs (Putnam, 1993), stimulating collaboration (Bachmann & Inkpen, 2011), and sustaining economic performance (Algan & Cahuc, 2010). Incorporating these insights, I argue that social trust will negatively affect the ability of bribes to grease more new products in these markets.

Greater levels of societal trust will reduce the ability of bribes to facilitate the introduction of new products in several ways. First, trustful societies endorse high moral standards and uphold legal behavior, thereby forcing corrupt bureaucrats and firms to preserve certain moral appearances by engaging in secrecy and participating only in a few carefully selected corrupt deals (Uslaner, 2004). Subsequently, this secrecy and selectivity reduce the usefulness of bribes as a generic alternative to the usual bureaucratic route by limiting the number of instances in which bribes are profitable for both bureaucrats and firms (Uslaner, 1999). Second, normative and mimetic pressures in high-trust societies will reduce the scale and scope of bribing benefits by promoting other non-monetary strategies as societal-preferred alternatives. Thus, in these environments, quid pro quo mechanisms will be better suited for governing the relationships between firms and bureaucrats, thereby limiting the ability of monetary exchanges (i.e., bribes) to deliver the sought-after benefits (Hunt, 2004). Third, given the importance of reputation in high-trust environments (Roberts & Dowling, 2002), innovative firms will make use of third-party intermediaries rather than directly engaging in corrupt

transactions (Frederiksson, 2014). While this strategy will reduce the risk of legitimacy spillovers (Kostova & Zaheer, 1999) and stakeholder penalties (Karpoff, Lee, & Martin, 2014), it will also deter the effectiveness of bribes by increasing costs and raising the potential for information loss and delays (Drugov, Hamman, & Serra, 2014).

Finally, a high level of societal trust will reduce the efficiency of bribes in greasing new products by undermining firms' ability to tap knowledge from the national and regional "innovation systems" in which they are embedded (Lundvall, 2002; Krammer, 2015). While bribery may serve as a quicker alternative for capitalization of a firm's new product innovation in the short term, its long-term performance hinges on accessing new knowledge from networks of collaborators and partners (Chryssochoidis & Wong, 1998) to develop and adapt new products (Harvey & Griffith, 2007). In high-trust societies, illicit behaviors like bribery will trigger adverse responses from other actors within these networks (e.g., refusal to collaborate or exchange knowledge), which will in turn have a negative impact on a firm's innovativeness and, ultimately, offset the efficiency of bribery as grease for deployment of its new products.

In contrast, low levels of societal trust will boost the effectiveness of bribes in facilitating more new product introductions. Many emerging markets are characterized by rapid urbanization, fast economic growth, and high fertility rates, constituting ideal "distrustful laboratories" for testing this conjecture (Hunt, 2004). In these societies, weaker moral standards will eliminate any risks for legitimacy spillovers or negative reputation effects, and bribery will openly become the norm for pursuing legitimate goals (Ufere et al., 2012), including the introduction of new, innovative products (Lederman, 2010). Bureaucrats in these environments will be able to demand informal payments directly (Frederiksson, 2014) and have more leeway in terms of rewarding or punishing firms (Gong, 1993; Bertrand et al., 2007), therefore increasing the effectiveness of bribery in delivering results to firms that employ it. Moreover, low levels of societal trust will mean that bureaucrats are more likely to bestow benefits on

firms in exchange for monetary payoffs as opposed to making non-monetary arrangements such as quid pro quo (Hunt, 2004), which the benefitting firm might not honor ex-post (i.e., once the benefit has been received). Finally, innovating firms in low-trust environments will be confronted with a sparse and incoherent national and regional system of innovation where cooperation and access to knowledge would be difficult (Chung, 2002). As a consequence, firms will rely heavily on internal efforts to develop new products, targeting almost exclusively domestic markets for their commercialization (Lederman, 2010), and therefore reinforce the importance of greasing local bureaucrats in exchange for a timely introduction of their new products (Luo, 2005).

In light of all these arguments, the level of societal trust will effectively decrease the ability of bribes to facilitate more new products to be introduced. Accordingly, I hypothesize that:

> Hypothesis 3: The quality of existing informal institutions will moderate negatively *(i.e., weaken) the effect of bribery on firms' new product introductions* in emerging markets.

METHOD

Data and Sample

To test these theoretical predictions, I employ firm-level data on new product introductions and bribery from the Business Environment and Enterprise Performance Survey (BEEPS IV), a joint initiative of the European Bank for Reconstruction and Development and the World Bank Group in 2009, which covers 30 emerging markets, including more advanced Central and Eastern European (CEE) countries, transition economies from the Balkans and Central Asia, plus Turkey[3]. Compared to indicators based on experts' assessments (e.g., Transparency International), this survey is conceptually more rigorous and less prone to

measurement biases (Razafindrakoto & Roubaud, 2010). BEEPS employs standardized survey instruments and a stratified sampling technique (at the level of the two-digit ISIC industry, firm size and geographic location) to yield data that is both representative and comparable across these countries. There is also a panel component of this dataset, yet the dimension and representativeness of the panel are insufficient for our analysis[4]. The BEEP survey comprises 16 sections that cover firm activities, interaction with governmental officials and characteristics of the business environment. The respondents are business owners or top managers. My final sample, after removing missing observations, consists of 6,085 firms. Descriptive statistics are reported in Table 1, while an overview of all variables is provided in Table 5 (Appendix).

Assessment of common method bias (CMB). Given the potential for CMB, I have taken several measures to ensure that this risk of CMB is significantly reduced. First, the design of the BEEPS survey provides several "procedural remedies" (Podsakoff et al., 2003) for this problem: (1) anonymity of responses both in terms of firm and interviewee's identities; (2) a good separation of questions on innovative performance – Section O, page 15- and bribery/informal payments – Section J, page 29 -; (3) and indirect phrasing to "sensitive" questions such as bribing, which eliminate self-incrimination and strategic responses due to social desirability or expectations of others. Second, to complement these procedural remedies, I have performed several statistical tests to check for any systematic correlation between variables due to measurement method. Specifically, I have performed a Harman's one-factor test using the variables in my model. The results of this analysis suggests that more than one factor are responsible for the variance in the considered variables, and moreover, that the first factor did not account for a significant portion of this variance[5]. Given the weak nature of the Harman's test, I have also controlled for the effect of a single unmeasured latent method factor (Podsakoff et al., 2003). In this test, a confirmatory factor analysis model is constructed such that all items are allowed to load on their theoretical factors (theoretical model), and another in

which they are also allowed to load on a latent common factor. When comparing our theoretical model (Chi2 =5244.3, d.f. = 36) with the one with the additional latent common factor (Chi2=5428.9; d.f.=54) the results suggest a better fit in the latter, less parsimonious model (ΔChi2 = 184.6, d.f. = 18, $p < 0.00$). Moreover, the latent common factor accounts for a very small portion (2.25 percent) of the total variance compared with other variables such as firm age (22.26 percent) or managerial experience (28.83 percent). In conclusion, the results of all these tests suggest that common method bias is not a pervasive problem in this study.

Dependent variable. Data on new product introduction is obtained from the "Innovation" section of the BEEPS survey following the usual conventions in this literature (OECD 2005). Using the answers obtained from the question "In the last three years, has this establishment introduced new products or services?" the dependent variable (npint) is binary (1-"yes"; 0-"no") with all missing observations and "don't know" answers being dropped from the final sample.

Independent variables. The BEEPS dataset provides a rich set of questions which capture various facets of corruption (i.e. frequencies, amounts, sources, and purposes). For this study, I focus mainly on the intensity of bribing, as a proxy for firm's ability to meet its specific demand for bribes (Svensson, 2003). The variable measuring bribing at the firm level (bribe) comes from the question: "It is said that establishments are sometimes required to make gifts or informal payments to public officials to 'get things done' with regard to customs, taxes, licences, regulations, services etc. On average what percentage of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?" Similar to other surveys on sensitive matters, these questions were phrased indirectly so that respondents do not implicate themselves in any wrongdoing and increase the truthfulness of their responses (Svensson, 2003). Therefore, the variable measures the percentage of sales devoted to bribing activities. In cases of firms that

have provided only the annual value of bribes, this amount was converted to percentage terms using their total sales value.

Given the nature of questions in BEEPS there is potential for a perception bias in these responses, as a result of differences in cultural norms, economic optimism, and degrees of political freedom across countries, which may influence the ratings and degree of criticism towards public officials (de Rosa et al., 2010)[6]. However, previous research has shown that there is no significant bias, as aggregated measures of corruption from surveys are statistically comparable to the other objective measures (Fries, Lysenko, & Polanec, 2003; Razafindrakoto & Roubaud, 2010). Moreover, compared to expert assessment and country-level measures, BEEPS unbundles this phenomenon, thereby allowing for more in-depth analyses of bribing heterogeneity across firms (Knack, 2007).

This important heterogeneity in terms of bribery is also present among the 30 emerging markets considered here, despite similar obstacles, such as the communist heritage and macroeconomic or institutional adjustments. Thus, Estonia, Slovenia and Georgia report the smallest average bribing rates across firms (0.07 to 0.12 percent of annual sales), while Albania, Kyrgyz Republic and Tajikistan have the highest (2.09 to 4.19 percent). In terms of subnational regions, some of the most intensive bribing regions are found in Tajikistan (Sogdiskaya and Dushanbe), and Kyrgyz Republic (Bishkek and Chui), while the majority of "low bribe" regions are in Central European countries (e.g., Transdanubia in Hungary, Louna-Eesti in Estonia, or Severozapad in Czech Republic). The average bribe varies also across industries from 0.47 percent of annual sales for Textiles to 1.37 percent for Metals.

To capture the relevant institutional factors I follow Kostova (1999) and focus on a couple of elements that are particularly salient to bribery. However, in the robustness checks discussed in the next subsection I employ more institutional proxies. Thus, formal institutional quality is measured using the control of corruption index developed by Kaufmann et al. (2009).

This indicator ranges between -2.5 (low control) to 2.5 (high control) using information from expert polls and surveys of managers. To simplify the interpretation, I have rescaled the original index by adding 2.5. Thus, the new variable ranges from 0 to 5, with higher values indicating better laws and regulations for controlling corruption. Informal institutional aspects are captured using a widely used measure of societal trust derived from a question in the 2008 round of the World Value Surveys (Inglehart 2004): "Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?" (Yes/No). Following prior studies, I compute my measure of informal institutional quality at the country level as the percentage of respondents in a country that have answered "Yes" to this question.

Controls. To account for any idiosyncratic differences in terms of bribery and new product introductions across countries and industrial sectors, I employ fixed effects specifications (for industry and country) throughout these regressions. Moreover, I include several firm-specific controls for innovation proposed by prior studies, as follows.

Firm size is commonly linked to innovation, as bigger firms are able to devote more resources to R&D, which result in more new products and processes. I measure size (size) as the number of permanent employees of the firm and include a dummy variable (R&D) for firms that have performed such activities over the past three years (Mansfield, 1965). Besides mass, experience is an important driver of firm innovative strategy (Hansen, 1992). Thus, age is calculated by subtracting the year when the firm was registered from the year of the survey and then transformed logarithmically. Furthermore, different governance modes impact firms' value, profitability and strategy (Hitt et al., 1996). This literature reveals significant differences between private and state owned firms (La Porta, Lopez-De-Silanes, & Shleifer, 2002) as well as foreign and domestic ones (Girma, Gong, & Görg, 2009). To account for these effects I use a foreign dummy and a state dummy, which take a value of 1 if a firm has a majority foreign, and respectively state ownership (i.e. greater than 50 percent), and 0 otherwise. Recent studies

emphasize also the role of managerial assets for firm performance (Bloom & Van Reenen, 2010), value creation, and efficiency (Holcomb, Holmes Jr., & Connelly, 2009). I control for managerial experience (manexp) by including the number of years the manager has been working in the industry. Likewise, high performing firms are more likely to both innovate more as a result of superior capabilities, and bribe more, as a result of greater financial availability (Svensson, 2003). Therefore, I include in all regressions a proxy for firm performance, computed as the log difference of firm sales less its labour costs. Further, the link between competition and innovation has received a lot of attention since the seminal work of Schumpeter (1938). Hence, I include a measure of competition to account for its potential effects on firm innovation (Aghion et al., 2009) capturing the pressure from domestic competitors on the decision to develop new products on a Likert scale (1-"not at all important" to 4 -"very important"). Moreover, given the strong complementarity between firm innovation and exports (Golovko & Valentini, 2011) I include a dummy (exporter) control for exporting firms. Finally, firms' access to financial resources is critical for their innovative performance (Ayyagari et al., 2011). Finance is a dummy variable that equals 1 for firms that have a credit line from a private bank, and 0 otherwise.

Estimation strategy and econometric issues

To estimate the impact of bribery on firm's new product introductions, I follow previous studies (Lederman 2010) and use a probit model that fits appropriately the binary nature of the main dependent variable (npint):

$$npint_f = \Phi\{\alpha_0 + \beta_1 bribe_f + \beta_2 formal_c + \beta_3 informal_c + \beta_4 formal_c * bribe_f + \beta_5 informal_c * bribe_f + \alpha_1 controls_f + \lambda_s + \eta_c + error\}$$

Where npint is a dummy that equals 1 for any new products or services introduced in the past three years; Φ denotes the cumulative standard normal distribution; f, s, c index firms, sectors

and countries; controls include all the firm specifics detailed in the previous section; λ_s and η_c are the industry (sector) and respectively country fixed-effects.

Estimating this equation through a simple logit or probit regression may lead to biased estimates of the betas, given the endogeneity issue between bribery and any measure of firm performance, including introduction of new products (Vial & Hanoteau, 2010). Corrupt bureaucrats establish taxes, administrative hurdles and delays to extort bribes in line with firms' perceived capacity to pay them. The latter is reflected by firms' current and expected assets, which also include profits from new products and services that are about to be launched. Thus, innovative firms are more likely to face bribing demands (Ayyagari et al., 2014), given their greater ability to pay, as perceived by bureaucrats (Svensson 2003). Bribes and innovative performance are jointly determined by a multitude of factors that are specific to various industries (e.g., technological maturity), countries (e.g., institutions, wealth) and geographic locations (e.g., industrial concentration, habits of local bureaucrats).

To correct for this endogeneity bias, I follow Fisman & Svensson (2007) and instrument my firm-level measure of corruption (bribe) with the average bribe in a given sector-region-country unit excluding the focal firm, obtained also from BEEPS. Regions are defined as subnational political-administrative units in a country. The underlying assumptions, confirmed by the data, are that sector-region-country bribing rates are highly correlated with individual firm bribes (correlation=0.488) but uncorrelated with firm innovative performance (correlation = 0.005). Thus, the proposed instrument is a valid determinant of firm bribes (F statistic of 1901.27, $p<0.0001$) but does not affect firm's propensity to innovate (F statistic 4.13, $p<0.042$). Moreover, using these average values for instrumentation mitigates also potential measurement errors associated with bribes, given firms' reluctance to report such payments (Vial & Hanoteau, 2010). The null hypothesis that bribes are exogenous is also rejected empirically, as the values of the Wald exogeneity test are statistically significant across most specifications.

The Anderson-Rubin (AR) tests also report p-values with high significance, commonly at 1%, indicating that the weak instrument problem is not present in these estimations.

Therefore, firm level bribes are treated as endogenous throughout all specifications, while the quality of formal and informal institutions is considered to be exogenous to the firm innovation (i.e., introduction of new products), since these variables are measured at country level, and therefore cannot be significantly influenced by the individual actions of any one firm. These conclusions are also supported by the results of the Wald tests. Finally, the relationship between bribery and our formal institutional proxy could suffer from endogeneity issues. Although from a theoretical perspective, prior literature has proposed a variety of alternative explanations (Svensson, 2003; Bertrand et al., 2007; Galang, 2012) that trump the effects of formal institutions, I also test it empirically using the Durbin–Wu–Hausman test for endogeneity, as discussed in Wooldridge (2010)[7]. The results of this test (Residual = 0.07; Chi2(1) = 1.45; Prob > Chi2 = 0.23) fail to reject the null hypothesis that bribery is endogenous to our formal institutional moderator, namely the control of corruption laws and regulations.

Empirical analysis and results

Table 1 presents correlations between main variables of interest. In most cases these are within acceptable limits. I also compute variance inflation factors (VIFs) for each model, with satisfactory results. Finally, to accommodate for the presence of group-wise heteroskedasticity, as indicated by exploratory plots of residuals against my measure of bribery, I employ robust standard errors in all estimations. The main results are reported in Table 2.

Model 1 presents the benchmark regression with all the controls, confirming past insights from literature regarding the drivers of firm innovation. Thus, size and R&D investments, foreign ownership, access to finance, competition and exporting are all associated with greater probability of firms to introduce new products. Model 2 tests the effect of bribery

on firm product introductions. The coefficient of bribe is positive and significant at 1% and remains within this range throughout the rest of estimations, thus supporting my first hypothesis. The mean marginal effect of bribes computed using the margins command in Stata 14.2 is 0.055 (z statistic=3.92; p<0.00), indicating that a one percent increase in bribes increases the probability of introducing new products by 0.06% highly significant. This magnitude is consistent with our conjecture that bribes grease more new products in the market, while the core determinants of these product innovations remain R&D investments (0.85), learning by exporting (0.26), foreign ownership (0.20) and access to financial resources (0.19). Models 3 and 4 examine the moderating effect of institutional quality on the relationship between bribery and new product introductions. Since the two institutional variables chosen (i.e., control of corruption for formal aspects, and average societal trust for the informal ones) are both measured at the country-level, their direct effect on firm's propensity to introduce new products is wiped-out by the use of country fixed-effects, as a more efficient way to control for unobserved cross-country heterogeneity (Models 1, 2 and 8). However, in order to show the direct effects of institutional features, I drop the country fixed effects. Both coefficients of the institutional variables are positive and significant, confirming previous findings of a positive effect of institutions on new product introduction (Models 3 through 7). More importantly, the coefficients of these interactions are both negative and significant regardless of specification, and in line with my hypotheses that formal and informal institutional quality makes bribing less effective in introducing new products in these markets.

Insert Figure 1 here

To get an overview of these effects, I have also plotted these interactions holding all other variables constant. Figure 1 shows that the efficiency of bribes in facilitating new product introductions is contingent on the quality of laws and regulations in place to deal with

corruption. In very effective (stronger) institutional environments (i.e., with well-established regulations for control of corruption) paying large bribes is less efficient than following the common bureaucratic route with negative impacts on the propensity to introduce new product innovations. Given that most firms (98%) in our sample declare bribes below 20 percent of their sales, the average probability to innovate decreases from 0.6 to 0.2. In turn, in less effective (weaker) regulatory regimes bribery presents similar benefits increasing a firm's chances for successful new product introduction. The majority of firms stand improve their chances from 0.6 to 0.8 contingent on their bribing strategy. These results confirm that bribing benefits are extremely sensitive to regulatory aspects, and stress the role of strong anti-corruption legislation and enforcement as means to reduce the effectiveness of bribes in these markets.

Insert Figure 2 here

Likewise, some interesting results emerge upon examining the effect of informal institutions on the relation between bribes and new product introductions (Figure 2). All else equal, going from no bribe to a very high bribe in an unreliable (low-trust) society roughly doubles firms' probability to deploy new products in the market from 0.4 to 0.9. Oppositely, in countries with high levels of societal trust bribing is actually reducing innovator's chances of introducing products by a small margin (less than 0.02). However, given that 98 percent of firm bribe are under 30% of their sales the success differential between bribers and non-bribers is slightly smaller (0.1 to 0.2).

Robustness tests

To check the robustness of these results, I perform several other estimations by: (1) including additional controls documented by prior literature to enable (or hinder) firm

innovation, (2) testing the hypotheses in various subsamples of the dataset, (3) employing different measures for the main variables of interest (new product introductions, bribery and institutions), (4) checking for selection-bias, (5) providing some empirical validation for the theoretical channels proposed in this paper, and (6) checking these results at more aggregated level of analysis. Most of these results are not reported here due to inherent space constraints, but are available upon request.

Additional control variables. Past studies have proposed other drivers for firm innovation that were not included in my baseline specification. For instance, the availability of skilled labor (human capital) is commonly associated with superior innovative performance (Furman et al., 2002). Information technology (IT) infrastructure spurs the diffusion of technology across borders with positive effects on creation of novel products (Czernich et al., 2011). Quality improvements and external sources of technologies, in the form of licensing agreements (Arora, Fosfuri, & Gambardella, 2001; Krammer, 2014) or technological alliances with foreign partners (Krammer, 2016), also increase firm innovative performance. Finally, firms from emerging markets are much more dependent on public funding and government links for their innovative activities than counterparts in more advanced economies (Krammer, 2009). Therefore, I control for all the above factors in additional regressions, namely adequate labor[8] (i.e., availability of adequate workers), internet (i.e., broadband access), ISO quality accreditation, technological licensing, subsidies and state-owned. Throughout these estimations the coefficient of bribe remains positive and retains a high level of statistical significance, supporting my previous findings.

Additional instruments. While the use of an average bribe at sector-region-country unit excluding the focal firm has been validated in prior literature (Svensson, 2003; Fisman & Svensson, 2007), group-level random shocks may still create, in theory, spurious correlation between individual firm's bribes and peer averages (Angrist & Pischke, 2008). Therefore, to

test the robustness of these results, I have tried other instruments from BEEPS, which measure whether gifts or informal payments were expected by governmental officials in different contexts (e.g., to obtain an electrical connection, water connection, telephone connection, construction permits, import licenses, operating licenses, by tax inspectors, to obtain compulsory certifications, and permits for acquiring land). Although, in most of these cases, the sample size decreases significantly the positive effect of bribes instrumented by these variables remains, but it is significant only for requests of tax inspectors bribe and those for land permits. These two instruments pass also successfully the Anderson-Rubin test.

Different subsamples. Next, running a number of additional estimations across different subsamples of the dataset yields similar results to those reported in Table 2. First, I eliminate all potentially not truthful responses (as judged by the survey administrators) and all non-registered enterprises (in total 88 observations). Second, I account for influential observations using Cook's square distance. Observations for which this distance measure is greater than 4/N, where N is the number of observations were marked as outliers and excluded from estimations. Third, I check these effects across different groups of countries (CIS versus CEE) and firm size classes (small, medium and large). The positive effects of bribing on new product introduction are stronger for CIS countries, consistent with our third hypothesis regarding the moderating effect of institutional quality, while in terms of size, small and medium size firms (less than 50 employees) appear to gain the most from greasing. Finally, the problem of adverse selection for corruption is well-known in the case of public procurements, with public officials in these environments being more likely to reward vendors based on their bribes rather than the quality of their products (Auriol, 2006). To make sure that these results are not driven by adverse-selection, I re-run the analysis without firms with public procurement contracts (N=4,682) and results are robust to this change.

Different measures of product introduction, bribery and institutions. Further, I use different measures (proxies) for the two main variables of interest, namely bribery and new product introduction (Tables 3 and 4)[9]. First, I examine effects of bribes on sales from new products (as a proxy for commercial success, or quality of these new products) using a Tobit estimation (Model 9, Table 3) the coefficient is again positive and significant, suggesting that greasing confers tangible benefits to firms in terms of capitalizing their innovations. Next, I follow Ayyagari et al. (2011), and employ a rougher proxy (i.e., more incremental innovations) which equals 1 if a firm has upgraded an existing product over the past three years, and zero otherwise (Model 10, Table 4). Interestingly, when focusing on these product upgrades, the positive effects of bribing disappear, in accordance with my conjecture that bribes perform a necessary function of facilitating a faster access to markets for new innovative products, by circumventing the existing institutional bureaucracy that surround these procedures. The other estimations in Table 4 check different additional proxies for corruption obtained from the BEEPS survey, namely the percent of contract value paid to governmental officials to secure this contract (Model 11), or the frequency of bribes to insure a smooth relationship with customs (Model 12), courts (Model 13) and tax officers (Model 14). These institutional frictions are among the most prevalent environmental factors impacting firms' product innovation (Hadjimanolis, 1999). In all these instances, the coefficients of these bribing proxies are positive and highly statistically significant, reinforcing my previous conclusions.

Similarly, there are many aspects that characterize institutions. Following prior work in this area (Kostova, 1999; Kostova & Zaheer, 1999) in the main analysis I have focused only on two such elements that are most salient for bribery. However, to check the robustness of my conclusions I have included a variety of other proxies for institutions. For informal aspects, I have used two variables: (1) the degree of tightness/looseness of a society (Gelfand et al., 2011) which has direct implications for enforcement of rules and tolerance for deviant behaviors, and

(2) Hofstede's (1997) four core cultural dimensions – Individualism, Power Distance, Uncertainty Avoidance and Masculinity- which have been linked in the past with aggregated rates of corruption (Husted, 1999). Overall, the results are in line with my previous findings, especially in the case of Hofstede's values where data is available for 9 countries in my sample, as opposed to 5 in the case of Gelfand et al. (2011) data. For formal institutions, I examine the effect of three measures of political accountability (i.e., governmental fractionalization, number of veto players and political polarization), which have been shown to be conducive of higher regulatory quality (Beck et al., 2001). The results using these three measures of formal institutions are robust and again, support the negative moderating effects on the relationship between bribes and new product introductions.

Selection bias. Firms may self-select into bribing and this self-selection may bias our results. To check whether this is the case, I carry out additional estimations using a maximum-likelihood Heckman probit (see Table 6, Appendix). This estimator models specifically firm's decision to engage in bribery as a first stage ("selection") equation, and then controls for this selection effect in the second stage ("outcome" equation) and examine the subsequent impact of bribery on new product introductions. These results confirm that selection bias in not a pertinent issue in the case of new product introductions, as the correlation coefficient between the two equations (Rho) remains insignificant throughout most specifications. The subsequent likelihood ratio tests fail to reject the null hypothesis, namely that the correlation between the two error terms equals zero. Lastly, the coefficient of bribes in the outcome equation remains positive and highly statistically significant across all these additional models.

Validation of the proposed mechanisms. Finally, the Heckman analysis provides also an opportunity to test empirically some of the theoretical mechanisms proposed in this study. Following Birhanu et al. (2016), I employ reverse causal inferences, and explore correlations in the data with two proposed mechanisms for which data is available (bureaucratic obstacles;

political risk), against other alternative explanations for greasing (e.g., fend off competitors and consumer pressure, avoid paying public utilities and taxes). These results confirm that firms who face a greater bureaucratic burden, and are more wary of political instability are more likely to engage in bribery (Table 6, Appendix). The effects are robust to introduction of alternative explanations for strategic use of bribery in conjecture to new product introductions (i.e., pressures from competitors and customers, or illicit firm behaviors such as overdue payments for utilities and taxes). While this analysis cannot completely exclude other malign reasons for using bribery that are not captured by this data, it confirms some of the theoretical reasoning behind this study and calls for subsequent examinations of these mechanisms.

Different levels of analysis. Much of the literature on corruption has been conducted at aggregated levels of analysis, usually the country-level, and a common finding among these studies is that corruption has negative (sanding) effects. To test this in the case of new products, I examine the relationship between average bribes paid (within a country, and then, within a region) and the average probability of firms to introduce new products in a country (Figure 3), respectively region (Figure 4). The simple correlation coefficient between average bribe and average new product probability is negative and highly significant, both at the level of the country (-0.27; $p<0.00$) and the region (-0.11; $p<0.00$). Similarly, simple regression results confirm that sanding might actually prevail when examining the same data at more aggregated levels of analysis, with regression highly significant coefficients for country level bribes (-0.05; $p<0.04$), and negative but insignificant coefficients for regional bribes (-0.01; $p<0.54$). Thus, while these results support the sanding consensus, at least at the country-level, they also suggest that "greasing" and "sanding" effects can occur simultaneously, contingent on the level of the analysis considered.

Insert Figures 3 and 4 here

DISCUSSION AND CONCLUSIONS

The consensus in the literature is that corruption is detrimental for a country, and its negative consequences are consistently found in relation to key economic indicators such as GDP growth, trade, productivity, or foreign direct investment (Cuervo-Cazzura, 2008; Anokhin & Schulze, 2009; Dutt & Traca, 2010). In contrast, there are significant gaps in our understanding of the consequences of bribing for firm strategies (Galang, 2012; Cuervo-Cazurra, 2016), and in particular for innovative performance (Mueller et al., 2013). This study reveals that, in the context of emerging markets, firms' bribery has positive (i.e., greasing) impact on their ability to introduce new products, but that this effect is contingent on the formal and informal pressures in these environments. Moreover, ancillary results suggest that greasing is a strategic response of firms to ensure a timely deployment of their new products in the face of bureaucratic hurdles and political risk.

This study makes several important contributions. First, it contributes to the corruption literature by expanding the emerging scholarly work on the consequences and strategic uses of bribery. Researchers have only recently begun to explore the strategic responses of firms through bribery (Iriyama et al., 2016), so our understanding of its effects remains confined to several aspects, namely entry modes (Uhlenbruck et al., 2006), exports (Lee & Weng, 2013), and capital investment (Birhanu et al., 2016). In turn, I focus on a strategic aspect (i.e., introduction of new products) that is critically linked to firms' long-term performance (Banbury & Mitchell, 1995; Schoonhoven et al., 1990; Wang & Chen, 2015) and show that bribery can positively influence firms' ability to cash in on their product innovations (Chryssochoidis & Wong, 1998).

While prior research shows that innovators are disproportionately affected by bribing demands as opposed to non-innovators (Ayyagari et al., 2014), my findings suggest that there are also benefits from bribing. Namely, bribes can help firms to circumvent bureaucracy (Luo,

2005), avoid political risks (Darendeli & Hill, 2016), and make up for a lack of favorable affiliations (Leff, 1964). Since bribery demands significant financial and managerial resources (Martin et al., 2007), firms employ it strategically (Spencer & Gomez, 2011; Iriyama et al., 2016) to reduce the uncertainty, timing, and costs surrounding new product introductions in emerging markets, which are often characterized by heavy bureaucracy and a volatile political landscape (Li & Atuahene-Gima, 2001; Kotabe et al., 2017). As such, bribing provides an alternative option for reducing transaction costs, and it enables firms to evade their usual role of victims in the face of corruption (Galang, 2012).

Second, and related to the above, I show that the effectiveness of bribery in greasing new products in these markets is contingent on the formal and informal institutional settings (North, 1990; Hunt, 2004). Prior studies have documented the impact of formal regulations on corruption by examining its impact on multinational firms (Spencer & Gomez, 2011) and foreign direct investments (Cuervo-Cazzura, 2006, 2008). Complementarily, I propose that informal institutions (i.e., levels of societal trust) are equally important in inhibiting bribing efficiency. Specifically, I show that bribing in high-trust societies will be less proficient in speeding up product introductions, given the prevalence of non-monetary mechanisms, reputation effects, and moral considerations (Hunt, 2004; Uslaner, 2004; Karpoff et al., 2014). Therefore, in addition to national and international regulatory provisions, informal mechanisms can also serve as effective tools in curbing the appeal of corrupt behaviors (Martin et al., 2007; Gelfand et al., 2011).

Third, this study extends the product strategy literature. While prior work in this area has paid significant attention to micro-specific explanations of technological, financial, or organizational nature (Evanschitzky et al., 2012; Nadkarni & Chen, 2014), our understanding of the impact of external environments on a firm's product strategy remains limited (Bstieler, 2012). This issue is particularly salient in the context of emerging markets, which are often

marked by high uncertainty and volatility (Lee et al., 2011; Story et al., 2015). By evaluating the moderating effects of formal and informal institutions, this work answers recent calls to examine the impact of macro-contextual factors on new product strategies (Story et al., 2015). Moreover, it documents the importance of non-market strategies as a specific tool that managers in emerging markets can employ to reduce uncertainty, delays, and arbitrary penalties that affect their product introductions.

In terms of practical implications, these findings inform both managers and policymakers on multiple fronts. Innovating firms can bribe strategically public officials to reduce cumbersome regulatory processes, eliminate biases from the decision process, and avoid disruptions to their activities, all with the final goal of speeding up and facilitating the introduction of their product innovations in these markets. While bribery may provide a second-best alternative for innovators to deal with bureaucracy and political volatility, it still represents a deadweight loss for societies as a whole. Considering the importance of new products for both firms and consumers, governments should focus on reducing the appeal of, and the opportunities for, greasing bribes by improving the existing system. This goal can be achieved through streamlining the existing legislative approvals for new products, increasing transparency surrounding these decisions, and facilitating non-discriminatory access to public resources for firms. Complementarily, raising public awareness about corruption and forcefully and impartially pursuing perpetrators could reverse, albeit slowly, the permissive socio-cultural norms that perpetuate bribery as an efficient grease in these markets. Therefore, significant formal and informal reforms are required to achieve better control of corruption and greater trust in the governmental apparatus. Implementing such reforms will decrease the strategic appeal of bribery compared to the normal institutional route. Finally, when managers in emerging markets are confronted with bureaucratic obstacles or political volatility, the results of this study can inform them about potential lucrative and strategic uses of petty bribes in

emerging markets. However, these benefits must always be weighed against the costs of bribing and its long-term negative externalities (e.g., reliance on bribes, reputation effects, and legal penalties).

This work is not without limitations, which also provide several intriguing avenues for future research. First, besides the benign explanations theorized in this paper to support the greasing effect of bribing, alternative explanations via less reputable means (e.g., posing entry barriers to competitors, avoiding labor taxes, or relaxing safety standards and regulations) could explain how bribes may favor indirectly the performance of innovators in these markets. As much as the BEEPS data allows, the present work has been able to successfully exclude such alternate explanations by testing them empirically against the mechanisms envisioned in the paper. Nevertheless, future studies in this area may want to focus explicitly on uncovering and disentangling the effects of these two types of mechanisms (benign – e.g., compensate for lacking political affiliation, or malign – e.g., desire to stifle competition) on firm performance in emerging markets. Such investigations will help us understand comprehensively whether bribing is a strategic response or an investment for firms in this context. Subsequently, these lines of inquiry would be able to provide clearer policy recommendations regarding corruption and the areas (i.e., supply or demand) in which governmental efforts should be concentrated.

Second, another potential explanation for these results is that the new product innovations introduced through greasing are of inferior quality than those introduced without. As a result, innovators may cut back on the quality of their products to compensate for the funds set aside for bribing activities. In such a scenario, we would expect to see a positive effect of bribing both at the firm-level and at more aggregated levels of analysis, as all innovators will choose to bribe and then compensate for these expenses by reducing the quality of their products. However, there are several reasons why this is likely not to be the case. Theoretically, bribing can only affect the introduction of a product (via timing or easiness of the process) but

not its subsequent market performance. The latter depends on market factors such as price, competitive position, quality, and features (Danneels, 2002; Katila & Ahuja, 2002), all of which cannot be altered through bribing. Empirically also, firm bribery has a positive effect also on the percentage of sales from these new products, suggesting that firms do not cut back on the quality despite greasing the bureaucrats. Moreover, the aggregated data shows a negative macro-effect of bribery on innovation, which contradicts the country-level predictions stemming from this quality-cutting scenario.

Third, these results might be driven by adverse selection, which is known to be significant in the case of public procurements (Auriol, 2006). Put simply, corrupt public officials could be more likely to award contracts to innovators based on their bribes rather than the competitive position or product characteristics. To dismiss this alternative, I have shown in my robustness tests that the greasing effect holds, even after eliminating all firms with public procurement contracts from the analysis. This suggests that greasing is present also the case of commercially-viable products vetted through market mechanisms – for example, how innovative, good, cheap, and well-suited to a market, etc. the product really is when compared to those of its competitors (Danneels, 2002) – as opposed to goods and services that cater to public procurement contracts. Although these results provide some assurance that adverse selection is not an issue in this case, the abundance of anecdotal evidence regarding the sub-standard features (e.g., Brazil's difficult preparation for the FIFA World Cup 2014, Russia's record $51 billion price tag for the 2014 Winter Olympics) or even dangerous properties of products in emerging markets (i.e., dangerous toys, melamine in milk powder in China) calls for deeper examinations of these issues. Potential areas for future research could examine the effects of transparency, procedural improvements, and accountability regarding the outcomes of public procurements in emerging markets.

Fourth, there are several data-related avenues for improvement. While numerous and diverse, the 30 economies considered in this study might not be representative of all emerging markets. Therefore, subsequent studies should aim for even greater diversity in terms of the number of countries covered, and see whether these results can be generalized to other emerging markets in Latin America, Asia, and Africa. Moreover, the dominant cross-sectional nature of the BEEPS dataset prevents me from drawing any dynamic (i.e., across time) implications of bribing strategies. Although, in this case, it is unlikely for bribery to have any long-term effects on a firm's new product introductions (most petty corruption payments are usually made for securing fast, case-specific benefits), future work in this area can confirm these conjectures empirically by employing large longitudinal datasets. Finally, although BEEPS stands out as one of the best sources of data for capturing firm-level corruption (Razafindrakoto & Roubaud, 2010), it still is susceptible to measurement issues (Svensson, 2003). For instance, previous studies attest to the prevalence of corruption in these markets, documenting a downward bias in perception-based corruption measures due to informational asymmetries and respondents' reticence (Olken, 2009; Kraay & Murrell, 2016). Quantifying these biases through more refined survey techniques, as well as explaining these differences both within and across countries could provide some fruitful lines of inquiry.

Fifth, the results of my robustness tests present also several attractive opportunities for future contributions. For instance, preliminary evidence, although not very strong, indicates potential nonlinearities regarding the effect of bribes. Theoretically, this finding could be explained through decreasing returns for bribing, arbitrariness issues, or a mismatch between bureaucrats' demand for bribes and the supply of bribes from firms. Further examinations, potentially in conjunction with firm strategies, may yield important insights into the complex outcomes of bribery. Similarly, the results of the Heckman selection analysis have opened up the black box of bribery, providing an initial glimpse into its underlying mechanisms. While,

in this case, the process of examining and vetting these mechanisms was subject to data restrictions, future research may want to employ primary data to ensure a clearer identification of such mechanisms. Finally, an interesting finding of this study is that greasing and sanding may actually co-exist in the case of new product introductions, depending on the level of analysis considered. Building on this idea, future studies may re-examine this hypothesis in the case of well-established economic outcomes, such as productivity, economic performance, or exports.

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Figure 1

The interaction between firm bribes and formal institutions (control of corruption)

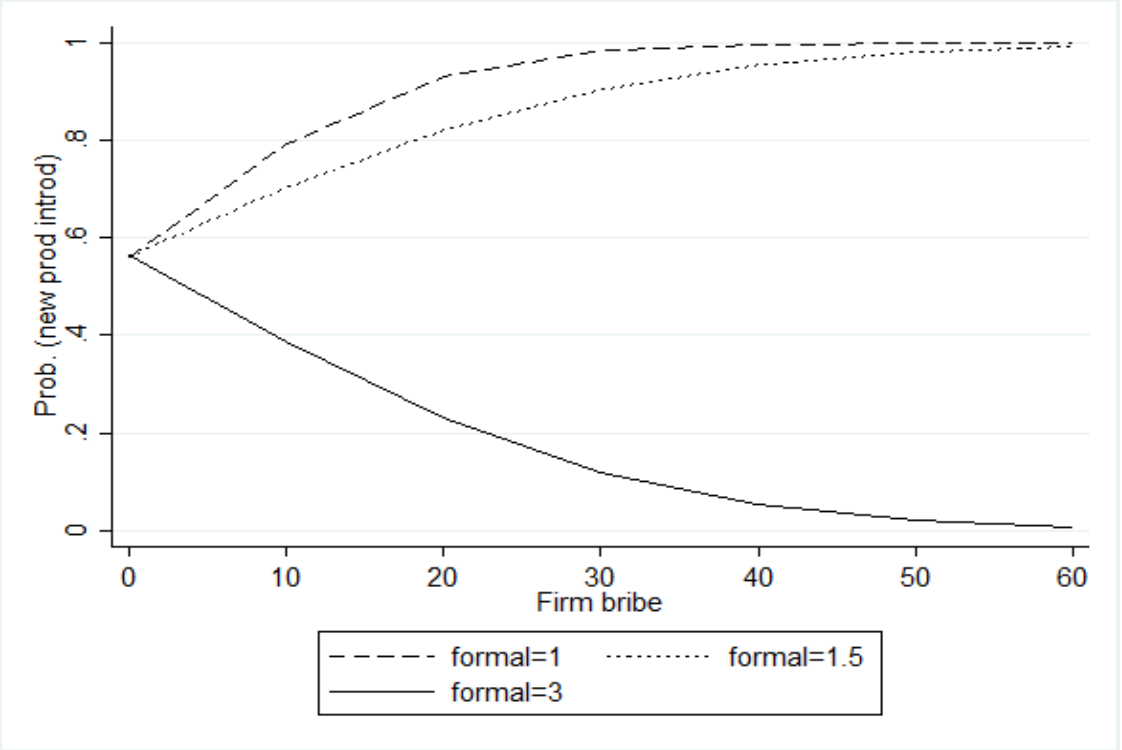


Figure 2

The interaction between firm bribes and informal institutions (societal trust)

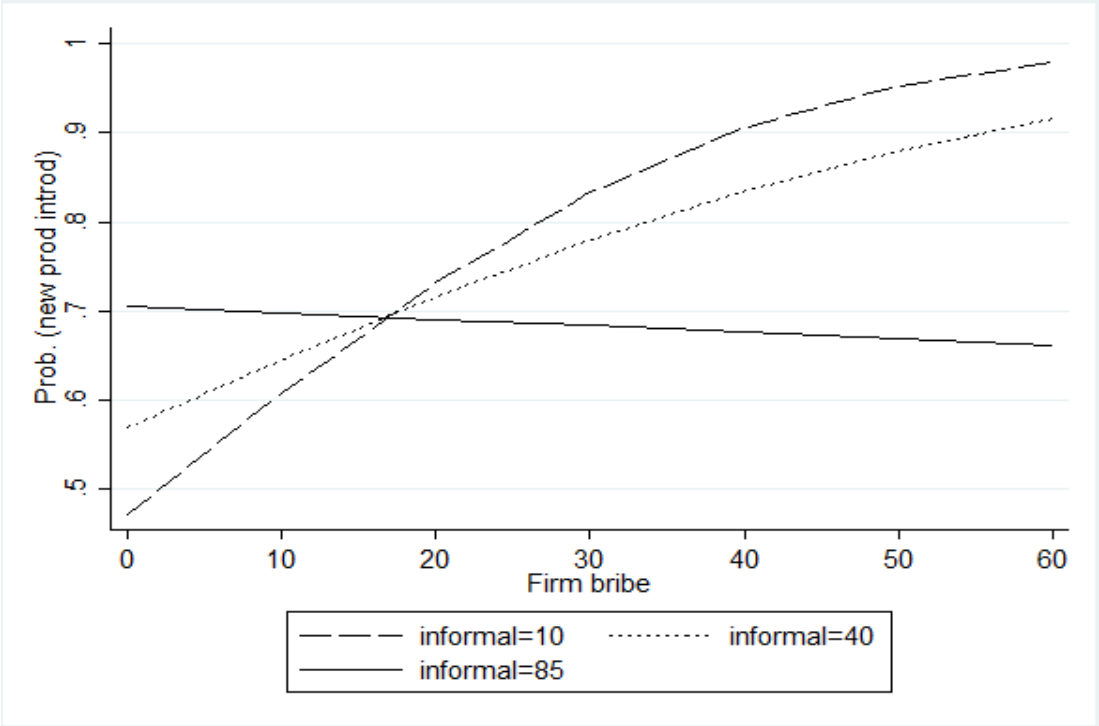
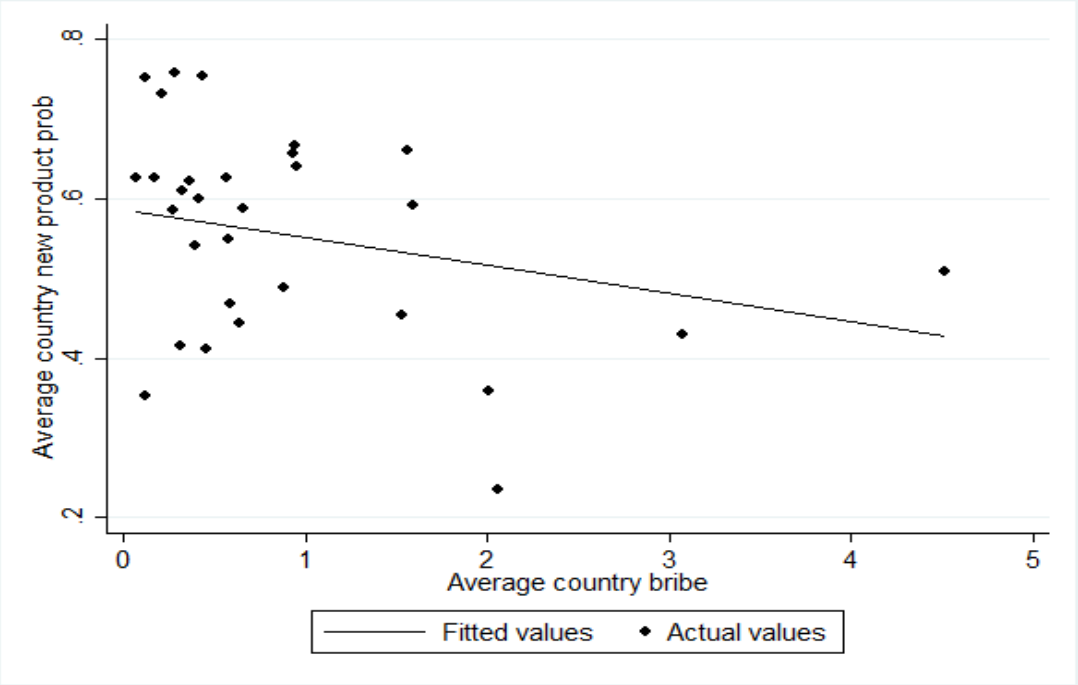


Figure 3

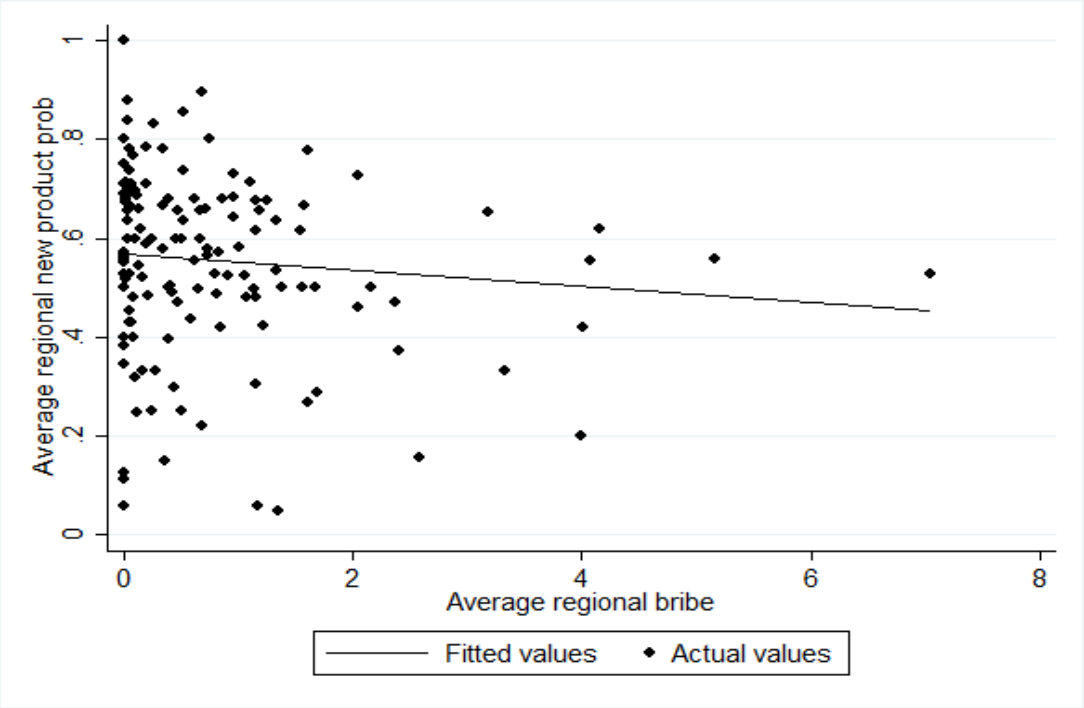
The average country-level effect of bribery on new product introduction



Note: I plot the average firm bribes in a country against average propensity of firms in a country to introduce new products.

Figure 4

The average region-level effect of bribery on new product introduction



Note: I plot the average firm bribes in a region against average propensity of firms in a region to introduce new products.

Table 1

Descriptive statistics

No.	Variables	Mean	St. Dev.	1	2	3	4	5	6	7	8	9	10	11	12
1	npint	0.57	0.49	1.00											
2	bribe	0.65	3.05	0.04***	1.00										
3	formal	1.79	0.57	0.01	-0.13***	1.00									
4	informal	40.13	16.81	0.10***	-0.04**	-0.25***	1.00								
5	logsize	3.54	1.47	0.13***	-0.03*	0.00	-0.02	1.00							
6	logage	2.55	0.65	0.03*	-0.03*	0.09***	-0.05***	0.28***	1.00						
7	foreign	0.08	0.27	0.07***	-0.02	0.09***	0.04**	0.18***	-0.03*	1.00					
8	managexp	17.37	10.38	-0.04***	-0.03*	0.12***	-0.20***	0.061***	0.21***	-0.07***	1.00				
9	competition	2.74	1.05	0.07***	-0.00	0.09***	0.03**	0.00	0.04**	-0.05***	0.00	1.00			
10	exporter	0.26	0.44	0.13***	-0.04**	0.19***	-0.12***	0.31***	0.14***	0.15***	0.08***	-0.06***	1.00		
11	R&D	0.28	0.45	0.30***	0.00	0.01	-0.01	0.23***	0.10***	0.04**	0.03*	0.01	0.19***	1.00	
12	finance	0.53	0.50	0.13***	-0.02	0.14***	-0.11***	0.23***	0.07***	-0.02	0.02†	0.05***	0.17***	0.13***	1.00
13	stateowned	0.01	0.11	-0.02	-0.02	-0.06***	0.11***	0.08***	0.10***	-0.03**	-0.01	-0.02	-0.00	0.00	0.00
14	firmperformance	15.85	3.62	0.13***	-0.04**	0.03*	0.12***	0.44***	0.08***	0.13***	-0.02	0.01	0.14***	0.12***	0.16***
15	bribegov	2.19	7.68	0.03	0.39***	-0.16***	0.01	-0.08**	-0.06*	0.00	-0.07**	0.02	-0.05†	0.05†	-0.03
16	bribecustoms	1.52	1.07	0.08***	0.23***	-0.23***	-0.04**	0.03*	-0.02	0.01	-0.05***	0.00	0.03*	0.04*	0.01
17	bribecourts	1.44	0.98	0.04**	0.20***	-0.22***	-0.03*	-0.02	-0.02*	-0.02	-0.06***	0.05***	-0.05***	0.02	-0.01
18	bribetax	1.61	1.09	0.03*	0.27***	-0.26***	-0.10***	-0.02†	-0.04	-0.02	-0.07***	0.08***	-0.08***	-0.01	-0.04***
19	bribery	0.23	0.42	0.04***	0.40***	-0.19***	-0.13***	-0.01	-0.03*	-0.02†	-0.02***	0.02	0.00	0.01*	-0.01
20	bureaucratic burden	13.14	21.43	0.00	0.06***	-0.03*	-0.14***	0.07***	0.03	-0.02†	0.06***	0.04**	0.03*	0.03	0.04***
21	no public resources	0.20	0.40	0.01	0.03	-0.07***	-0.13***	-0.00	0.01	-0.06***	-0.02	-0.01	0.00	0.02	0.08***
22	political risk	1.99	1.45	0.01	0.08***	-0.13***	-0.07***	0.00	-0.01	-0.03*	0.03	0.10***	-0.01	0.04**	0.02†
23	foreign competition	2.09	1.14	0.11***	0.01	0.15***	-0.08***	0.18***	0.10***	0.11***	0.03	0.24***	0.29***	0.19***	0.10***
24	domestic competition	2.74	1.05	0.07***	-0.02	0.09***	0.03**	0.00	0.04	-0.05***	0.00	1.00***	-0.06***	0.01	0.05***
25	consumer pressure	2.74	1.09	0.10***	-0.00	0.18***	-0.08***	0.08***	0.07***	0.02	0.04**	0.42***	0.08***	0.08*	0.07***
26	bad payer utilities	0.04	0.20	0.00	0.01	0.01	-0.03*	0.01	0.04**	-0.02	-0.01	0.02	0.01	-0.01	0.04*
27	bad payer taxes	0.05	0.22	-0.02†	0.01	-0.02	-0.11***	-0.01	0.02†	-0.03	0.01	0.00	-0.02	0.01	0.03
28	npsale	27.54	25.28	0.06***	0.06***	-0.08	-0.03	-0.05**	-0.07***	-0.02	-0.02	-0.03	0.00	0.04*	-0.01
29	upgrade	0.75	0.43	0.44***	0.02	-0.01	0.13***	0.12***	0.02	0.06***	-0.05***	0.05***	0.10***	0.23***	0.10***

Table 1 (continued)

Var. No.	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
13	1.00															
14	0.06***	1.00														
15	-0.04	-0.03	1.00													
16	-0.02	0.04**	0.18***	1.00												
17	-0.02	-0.02	0.19***	0.59***	1.00											
18	-0.02	0.00	0.25***	0.58***	0.63***	1.00										
19	-0.04	-0.14	0.32***	0.31***	0.23***	0.31***	1.00									
20	0.01	0.06***	0.09**	0.05***	0.04**	0.03	0.12***	1.00								
21	0.01	-0.01	0.03	0.05***	0.03*	0.04**	0.10***	0.05***	1.00							
22	-0.02	-0.04*	0.05†	0.17***	0.15***	0.18***	0.11***	0.12***	-0.00	1.00						
23	-0.01	0.06***	0.01	0.08***	0.03*	0.03*	0.04***	0.04**	0.02	0.08***	1.00					
24	-0.02	0.01	0.02	0.00	0.05***	0.08***	0.02	0.04**	-0.01	0.10***	0.24***	1.00				
25	-0.01	0.05***	-0.02	0.01	0.02	0.02	0.02	0.07***	0.02†	0.07***	0.32***	0.42***	1.00			
26	0.02	0.00	-0.03	0.01	-0.01	-0.01	-0.02	0.01	0.03**	0.01	0.03*	0.02†	0.05***	1.00		
27	0.01	-0.03*	-0.02	0.04**	0.03	0.03	0.04**	0.04**	0.04***	0.07***	0.05***	0.00	0.02	0.46***	1.00	
28	-0.01	0.05**	0.03	0.03†	0.04	0.04	0.06***	0.05	-0.01	0.05**	0.03†	-0.04*	-0.03†	-0.02	0.03	1.00
29	0.01	0.12***	-0.02	0.04*	0.02	0.01	0.00	0.01	-0.00	0.00	0.09***	0.05***	0.05***	-0.03	-0.05***	0.03†

† $p < 0.1$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$.

Table 2
Instrumental variable probit models

DV: New product introduction	Model 1[a]	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
logsize	0.04*	0.04**	0.02	0.03†	0.02	0.03†	0.02	0.03
	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]	[0.02]	[0.02]	[0.02]
logage	-0.02	-0.02	-0.01	-0.01	-0.02	-0.01	-0.02	-0.03
	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]
foreign	0.19**	0.19**	0.17*	0.16*	0.17*	0.16*	0.15*	0.21**
	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]	[0.08]
managexp	-0.00	0.00	-0.01**	-0.00†	-0.01***	-0.00†	-0.00	0.00
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
competition	0.11***	0.11***	0.10***	0.09***	0.10***	0.09***	0.09***	0.11***
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.08]	[0.02]
exporter	0.25***	0.25***	0.22***	0.25***	0.23***	0.25***	0.26***	0.27***
	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.05]	[0.06]
R&D	0.86***	0.85***	0.85***	0.85***	0.85***	0.86***	0.87***	0.88***
	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.05]
finance	0.19***	0.19***	0.20***	0.22***	0.21***	0.23***	0.25***	0.23***
	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.05]
stateowned	-0.35*	-0.33*	-0.17	-0.30†	-0.16	-0.33**	-0.31†	-0.37*
	[0.16]	[0.16]	[0.15]	[0.16]	[0.16]	[0.16]	[0.16]	[0.18]
firmperformance	0.01*	0.02*	0.03***	0.02***	0.02***	0.02***	0.02*	0.01
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
bribe		0.06***	0.05***	0.04***	0.29*	0.20*	0.87*	1.54*
		[0.02]	[0.01]	[0.01]	[0.14]	[0.08]	[0.38]	[0.63]
formal			0.07*		0.06*		0.13*	
			[0.03]		[0.03]		[0.06]	
informal				0.01***		0.01***	0.01***	
				[0.00]		[0.00]	[0.00]	
bribe * formal					-0.17†		-0.34*	-0.62*
					[0.09]		[0.16]	[0.26]
bribe * informal						-0.00**	-0.01*	-0.01*
						[0.00]	[0.00]	[0.00]
constant	-0.57*	-0.65**	-0.52**	-0.89***	-0.60**	-0.98***	-1.18***	-0.44
	[0.24]	[0.236]	[0.196]	[0.195]	[0.211]	[0.20]	[0.247]	[0.272]
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	No	No	No	No	No	Yes
N	6,085	6,085	6,085	6,085	6,085	6,085	6,085	6,085
VIF	4.53	4.49	3.32	3.96	3.86	3.86	3.89	3.47
LR Chi-Square	992.02	1036.89	830.31	877.04	815.96	867.80	829.14	861.23
Wald Exogeneity test	-	6.99***	3.89*	3.88*	3.75*	3.99*	4.75**	7.08**
Anderson-Rubin Chi-Square	-	14.90***	11.20***	11.20***	4.51*	6.50**	5.64**	7.66**

Notes:
[a] Model 1 is estimated using a simple probit given that the endogenous variable (bribe) is not included.
† $p < 0.1$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$.

Table 3
Tobit model.

DV: Percent sales from new products	Model 9
logsize	-0.70†
	[0.37]
logage	-4.93***
	[0.68]
foreign	1.02
	[1.45]
managexp	-0.03
	[0.04]
competition	0.07***
	[0.02]
exporter	0.44
	[1.05]
R&D	2.57**
	[0.89]
finance	0.94
	[0.87]
stateowned	-1.80
	[3.61]
firmperformance	0.05
	[0.17]
constant	47.32***
	[5.35]
bribe	0.23*
	[0.11]
Industry fixed effects	Yes
Country fixed effects	Yes
N	4,072
VIF	5.1
LR Chi Square	251.37
Wald Exogeneity test	0.54

† $p < 0.1$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$.

Table 4
Additional instrumental variable probit models.

DV[b]	Model 10	Model 11	Model 12	Model 13	Model 14
logsize	0.06***	0.09†	0.03†	0.04*	0.03*
	[0.02]	[0.05]	[0.02]	[0.02]	[0.02]
logage	-0.00	-0.04	-0.01	-0.01	-0.02
	[0.03]	[0.07]	[0.03]	[0.03]	[0.03]
foreign	0.17*	0.03	0.18*	0.24**	0.19**
	[0.07]	[0.21]	[0.07]	[0.07]	[0.07]
managexp	0.00	0.00	0.00	0.00	0.00†
	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]
competition	0.09***	-0.00	0.06***	0.03	0.04†
	[0.02]	[0.05]	[0.02]	[0.03]	[0.02]
exporter	0.20***	0.39**	0.16**	0.22***	0.21***
	[0.05]	[0.13]	[0.06]	[0.05]	[0.05]
R&D	0.79***	0.60***	0.79***	0.77***	0.79***
	[0.05]	[0.11]	[0.05]	[0.05]	[0.05]
finance	0.14***	0.18†	0.180***	0.19***	0.20***
	[0.04]	[0.10]	[0.04]	[0.04]	[0.04]
stateowned	-0.23†	-0.62**	-0.06	-0.08	-0.17
	[0.13]	[0.29]	[0.15]	[0.15]	[0.14]
firmperformance	0.01†	0.01	0.01†	0.02*	0.02***
	[0.01]	[0.02]	[0.01]	[0.01]	[0.01]
constant	0.31	0.27	-0.48	-0.43	-0.24
	[0.30]	[0.55]	[0.30]	[0.32]	[0.27]
bribe	0.01				
	[0.01]				
bribegov		0.12**			
		[0.04]			
bribecustoms			0.46***		
			[0.13]		
bribecourts				0.67***	
				[0.18]	
bribetax					0.41***
					[0.12]
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
N	7,665	1,560	6,788	6,778	7,121
VIF	5.10	5.16	5.20	4.57	5.11
LR Chi Square	1022.98	252.48	1080.66	974.60	1126.78
Wald Exogeneity test	0.48	11.51***	10.01***	14.77***	11.38***
Anderson-Rubin Chi Square	0.41	12.41***	13.17***	16.19***	13.90***

Note:
[b] For Model 10 the DV is whether the firm has upgraded its existing products, while for all other Models in the table the DV is new product introduction.
† $p < 0.1$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$.

APPENDIX

Table 5

Description of the variables

Variable	Description
npint	New product introduction (0/1)
bribe	Bribes as a percentage of annual sales of the firm
formal	Formal institutions - Control of corruption
informal	Informal institutions - Average level of trust
logsize	Logarithm of the number of employees
logage	Logarithm of firm age (2009 - year of establishment)
foreign	Majority foreign owned firms (0/1)
managexp	Managerial experience (years)
competition	Intensity of competition in domestic markets (0-4)
exporter	Exporting firm (0/1)
R&D	R&D performing firm (0/1)
finance	Existing finance from banks or lines of credit (0/1)
stateowned	Majority state-owned firms (0/1)
firmperformance	Logarithm of the difference between firm sales and labour costs
bribegov	Bribe as a percentage of governmental contracts obtained
bribecustoms	Frequency payments to deal with customs (0-6)
bribecourts	Frequency payments to deal with courts (0-6)
bribetax	Frequency payments to deal with tax officers (0-6)
bribery	Whether the firm bribes or not (0/1)
bureaucratic burden	Time spent by the manager dealing with governmental regulations
no public resources	Infrastructure and credit are important obstacles for firm activities
political risk	Political instability is a severe obstacle for firm activities
foreign competition	Foreign competitors are important for new product innovation
domestic competition	Domestic competitors are important for new product innovation
consumer pressure	Consumer pressure is important for new product innovation
bad payer utilities	Firm has not paid utilities in more than 90 days
bad payer taxes	Firm has not paid taxes in more than 90 days
npsale	Percentage of firm's sales from new products and services
upgrade	Upgraded products and services (0/1)

Table 6
Heckman probit models

Variables /Models	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22
Outcome equation	DV: New product introduction							
logsize	0.08**	0.09**	0.09**	0.07†	0.07†	0.07*	0.06**	0.07†
	[0.03]	[0.04]	[0.04]	[0.03]	[0.04]	[0.03]	[0.03]	[0.04]
logage	-0.15*	-0.16*	-0.16**	-0.13†	-0.13†	-0.13†	-0.13†	-0.14†
	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]	[0.07]
foreign	0.20	0.20	0.20	0.21	0.21	0.19	0.19	0.19
	[0.17]	[0.17]	[0.17]	[0.16]	[0.17]	[0.17]	[0.16]	[0.17]
managexp	0.01	0.01	0.01	0.01†	0.01†	0.01†	0.01†	0.01†
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
competition	0.08*	0.08*	0.08*	0.08*	0.07†	0.08*	0.08*	0.07†
	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
exporter	0.09	0.09	0.09	0.08	0.10	0.08	0.08	0.10
	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
R&D	0.87***	0.87***	0.87***	0.84***	0.84***	0.83***	0.83***	0.83***
	[0.10]	[0.09]	[0.09]	[0.10]	[0.10]	[0.10]	[0.10]	[0.10]
finance	0.39***	0.40***	0.40***	0.38***	0.37***	0.39***	0.38***	0.37***
	[0.08]	[0.08]	[0.08]	[0.08]	[0.09]	[0.09]	[0.09]	[0.09]
stateowned	-1.21*	-1.21*	-1.21*	-1.17*	-1.14*	-1.16*	-1.17*	-1.14*
	[0.56]	[0.56]	[0.56]	[0.55]	[0.55]	[0.55]	[0.58]	[0.55]
firmperformance	0.01	0.00	0.00	0.01	0.01	0.01	0.02	0.01
	[0.01]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
bribe	0.04*	0.04*	0.04**	0.05**	0.04**	0.04**	0.05**	0.04+
	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]
Selection equation	DV: Bribery							
lnsize	0.05***	0.06***	0.06***	0.06***	0.06***	0.06***	0.06***	0.06***
	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]	[0.02]	[0.01]	[0.02]
logage	-0.07*	-0.06*	-0.06*	-0.07*	-0.08***	-0.07*	-0.07*	-0.08*
	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]	[0.03]
firmperformance	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***
	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
R&D	0.06	0.06	0.06	0.04	0.02	0.03	0.03	0.02
	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
bureaucratic burden	0.01***			0.01***	0.01***	0.01***	0.01***	0.01***
	[0.00]			[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
no public resources		0.34***		0.32***	0.32***	0.32***	0.32***	0.32***
		[0.04]		[0.04]	[0.04]	[0.04]	[0.04]	[0.05]
political risk			0.09***	0.09***	0.09***	0.09***	0.09***	0.09***
			[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
foreign competition					0.04*			0.04*
					[0.02]			[0.02]
domestic competition					0.01			0.01
					[0.02]			[0.02]
consumer pressure					-0.00			-0.00
					[0.02]			[0.02]
bad payer utilities						-0.16		-0.30**
						[0.09]		[0.11]
bad payer taxes							0.14†	0.27**
							[0.08]	[0.09]

Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AthRho	-0.04	0.10	0.10	-0.23	-0.22	-0.26	-0.27	-0.25
	[0.26]	[0.32]	[0.32]	[0.20]	[0.20]	[0.20]	[0.20]	[0.20]
LR test (Rho=0)	0.03	0.10	0.43	1.38	1.17	1.66	1.83	1.66
N	6,085	6,085	6,085	5,909	5,770	5,886	5,891	5,745
Censored obs.	4,703	4,703	4,387	4,552	4,440	4,539	4,542	4,426
Log Likelihood	-3907.38	-3923.78	-3923.78	-3769.33	-3685.23	-3746.12	-3750.74	-3655.35
LR Chi Square	256.08	237.02	237.02	246.56	238.45	243.88	243.9	236.02

† $p < 0.1$
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$.

ENDNOTES

[1] Siemens, one of the world's leading innovators, was found guilty of frequently using bribes abroad during the period from 2008 to 2010, and was fined a record US$1.6 billion in U.S. and European courts. Samsung's heir, the billionaire Lee Jae-yong was just found guilty (August 2017) of corruption and sentenced to five years in prison in a scandal that also led to the impeachment of former South Korean president Park Guen-hye. Avon's CEO, Andrea Jung, had to step down and faced judicial action in 2012 as a result of a 2008 violation of the Foreign Corrupt Practices Act. Major pharmaceutical companies like Pfizer, Astra Zeneca, Merck, Roche, Pharma Swiss, Actavis, and GlaxoSmithKline were all fined in 2012 for making payments to secure lucrative contracts in emerging markets such as Bulgaria, Croatia, Russia, and Kazakhstan. Finally, in 2012, Wal-Mart paid $24 million to fast-track its construction permits for new stores in Mexico.

[2] Formally, new product innovations are defined as goods or services that are new or significantly improved in terms of characteristics or intended uses (OECD, 2005).

[3] Given the overlap between these criteria, the only term that fits well all these economies is "emerging markets".

[4] The BEEPS panel (over three rounds, i.e., 2002, 2005 and 2009) in the case of our specification has only 944 observations from 21 countries, raising significant doubts about the representativeness of this subsample for the overall population of firms in these economies. Further testing (t-tests, Kolmogorov-Smirnov and Kruskal–Wallis) confirms that the resulting panel of firms is not representative for the larger 2009 cross-section in terms of neither bribe, nor innovation.

[5] For our entire model, I extracted four factors with eigenvalues greater than 1 (ranging from 1.03 to 2.22) that account for 51.39 percent of the total variance (the first factor accounts for about 20 percent).

[6] Overall, 70% of the surveyed firms in BEEPS have answered the question regarding bribery, and the aggregate non-response rate is greater among innovators (29%) than non-innovating firms (14%) without controlling for firm- industry- specifics. The average non-response rate across countries regarding informal payments among firms is 30% with Albania having the highest (51%) and Hungary (6%) the lowest non-response rates to this question.

[7] This test has two stages: in the first one where I run an OLS regression with the hypothesized endogenous variable (bribery) as a function of control of corruption laws and regulations (i.e., the proposed instrument) plus a batch of controls (i.e., firm size, age and industry dummies). From this equation I generate predicted residuals, which are then inserted as additional regressors in the original probit estimation. Then I have tested the statistical significance of this residual using the Hausman test for which the null-hypothesis is that these residuals are zero and that therefore bribery is exogenous.

[8] I also test this using a skilled workers variable i.e., the percentage of workers with university degrees, with similar results.

[9] Results also hold when using a binary measure of bribes, or when including a squared term of bribe intensity which is jointly significant, but only at 10 percent, indicating potential non-linear benefits from greasing. However, when controlling for quality of institutions (formal or informal) the significance of the square-term of bribes disappears.