

# Institutions, corruption and entrepreneurship

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## **Abstract**

This paper analyzes the incidence of corruption on entrepreneurship and on the relation between institutions and entrepreneurship. It extends Baumol's (1990) theory of productive and unproductive entrepreneurship by assuming that talented agents can choose to become productive entrepreneurs offering bribes.

We test this framework in the case of Indonesia, over a panel of micro level data on manufacturing plants and households' and communities characteristics, and we show that the quality and features of formal and informal institutions impact the allocation of talent, but unevenly, depending on whether new ventures are bribing or not. In particular, we evidence a grease-the-wheel effect for entrepreneurship in presence of corruption.

## **1 Introduction**

There is an abundant and growing literature on the effect of institutions on entrepreneurship. See for example Estrin and Prevezer (2010), Puffer et al. (2010) and Tonoyan et al. (2010) for recent developments and Desai and Acs (2007) and Freytag and Thurig (2007) for more detailed reviews of this literature. In this field, the seminal works by Baumol (1990) and by Murphy, Schleifer and Vishny (1991) have posited that institutions influence agents' choice between starting a productive business and undertaking alternative activities such as rent-seeking. Baumol's famous theory of productive and unproductive entrepreneurship underlines how the rules of the game are influencing the allocation of talent between productive activities that are wealth creative, such as starting a business, unproductive activities that are redistributive, such as rent-seeking, and destructive activities such as criminality.<sup>1</sup>

Baumol (1990) suggests that this influence is 'indirect', as the features and the quality of institutions shape the structure of incentives and of rewards that individuals can get from productive entrepreneurial activities and from non-productive ones.

Murphy, Schleifer and Vishny (1991) formalize and test a similar idea, based on the model of talent allocation by Lucas (1978). They assume that in the choice between entrepreneurship and rent seeking activities, "talent goes into the activities that offer the highest private returns, which need not have the highest social return" (Murphy, Schleifer and Vishny 1991, p. 506). In particular, they show that this allocation is distorted by a high level of the red tape, and by a poor specification of contracts such as the unclear definition and lack in enforcement of property rights, a failing patent protection regime etc.

Following these two contributions, Acemoglu and Verdier (1998), Mehlum, Moene and Torvik (2003) and Sanders and Weitzel (2010) have developed further theoretically the

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<sup>1</sup> Murphy, Shleifer and Vishny (1991) define talent as the ability to run an activity and they assume increasing returns in ability.

relationship between institutions and agents' choice between productive entrepreneurship and rent-seeking or destructive entrepreneurship.

All these works, including those of Baumol (1990) and of Murphy et al. (1991), have in common to make a clear distinction between the alternative activities available to a talented agent. He can either start a business or become an unproductive entrepreneur who participates in corruption and rent seeking. This misses the fact that generally, and especially in least developed, developing and emerging countries characterized by high degree of corruption, business-level bribing can't be consider only as a temptation, but rather as a constraint that is hardly avoidable. Firms are forced into bribing if they want to start and continue their business there.

It is well admitted that corruption is negative for the macroeconomic performance of countries as it is detrimental to growth, to investment (Mauro 1995) and to entrepreneurship. This idea has however been challenged, in particular from a micro-level perspective, recognizing that corruption is in general detrimental to firms, but positing, following Leff (1964) and Lui (1985) that bribing can benefit some firms if it enable them to jump over excessive red tape, such as long and unnecessary administrative procedures and delays. This so called "grease-the-wheel" assumption admits that the relation is more complex as the red tape is often a product of the corruption system, with corrupt bureaucrats raising the red tape in order to racket firms (see Méon and Sekkat, 2005 for a detailed review of this literature). It has been evidenced empirically by Vial and Hanoteau (2010) in the high corruption context of Indonesia during the Suharto presidency. They show that in average, plants offering more bribes, enjoyed higher output and labor productivity growth.

In this paper, we propose to extend Baumol's (1990) theory of entrepreneurship by integrating the grease-the-wheel assumption. We assume that some productive entrepreneurs participate into the corruption system and coexist with non-bribing entrepreneurs. The choice of a

talented agent is not just productive or unproductive entrepreneurship, but can be somewhere in between.<sup>2</sup> We then offer new perspectives on the effect of corruption on entrepreneurship, but also on how bribes impact the complex relation between formal and informal institutions, and entrepreneurship, which has important policy implications.

Several studies have investigated empirically the relation between institutions and entrepreneurship, but those testing Baumol's (1990) and Murphy, Shleifer and Vishny's (1991) framework are seldom. An exception is Sobel (2008) who tests Baumol's (1990) theory in the case of the USA. He shows that the poor quality of local institutions favors unproductive entrepreneurship, as measured by local lobbying activity, and a negative impact on various indicators of productive entrepreneurship. However Sobel does not consider the fact that productive entrepreneurs exert financial and/or informational lobbying.<sup>3</sup> Our approach extends Sobel's contribution on this aspect as we consider the mix between productive and unproductive activities as an option for potential entrepreneurs. Another difference is that we take the case of Indonesia, a developing country characterized by a high level of rent seeking. The contributions by Mitchell and Campbell (2009) and by Tonoyan et al. (2010) are related to our study, although they do not envision explicitly the same framework. Mitchell and Campbell (2009) investigate, in the case of the USA, the effect of corruption and income on business venturing, considering reverse causalities between these three variables, which is different from Sobel (2008). This allows them to envision business venturing in the theoretical frame of individuals choice between becoming productive entrepreneur or employee in private company or in corrupt bureaucracy.

Tonoyan et al. (2010) investigate the micro-level determinants, mainly formal and informal institutions, of business corruption in European transition and Western industrialized

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<sup>2</sup> Similarly, under-paid civil servants can be forced into corruption. This was the case during Suharto presidency. Public wages were maintained at a low level voluntarily in order to encourage corruption at all level of the bureaucracy, as an instrument to maintain the system in place.

<sup>3</sup> See Hillman and Hitt (1999) for an analysis of firms' lobbying strategies in the US and elsewhere.

economies. They admit that in highly corrupt countries, the widespread presence of illegal business activities provides entrepreneurs with a certain rational justification to engage also in corruption activities. This is positing, like us, that entrepreneurs undertake a mix of productive and unproductive activities.

In the next section, we present our theoretical assumptions that are derived from the relevant literatures at the cross section of entrepreneurship and institutions on the one hand and corruption and the grease-the-wheel assumption on the other. In addition, we present the context of corruption in Indonesia in the 2000s. In the third section, we present our empirical model which uses panel data Instrumental Variable (IV) regression techniques. We also present our panel data set which gathers subsector-level and local-level data on industry, business venturing, corruption and institutions in Indonesia for the years 2000 and 2007. The fourth section presents the results. They show that corruption impact entrepreneurship. In particular, we evidence a grease-the-wheel effect in entrepreneurship as a higher level of average bribes explains significantly a higher rate of new entry of bribing ventures in a subsector in a particular district, whereas the result is opposite in the case of non-bribing new ventures. In addition, we show that formal and informal institutions impact differently entry depending on whether new ventures are bribing or not. This supports our extension of Baumol's (1990) theory of productive and unproductive entrepreneurship. The last section concludes and offers a discussion on the policy implications of these results.

## **2 Theory and hypotheses**

The theory of productive and unproductive entrepreneurship that we have discussed rests on the assumption that talent is allocated to the activity that offer the highest private return

(Baumol, 1990; Murphy, Shleifer and Vishny, 1991; Acemoglu, 1995). This means that a change in the structure of activities' relative payoffs, will change the talent allocation. In particular, higher wages offered to employees in private companies will reduce incentive to entrepreneurship (Sanders and Weitzel, 2010). Mitchell and Campbell (2009) support this negative relation arguing that this will be the case if business venturing is “a survival behavior”, and entrepreneurship, as a source of self employment, is an answer to the scarcity of alternative employment options.

**Hypothesis 1a:** Higher wages offered by private companies reduce incentive to entrepreneurship.

Mitchell and Campbell (2009) consider that there is a reverse causality in this relation and that its sign is ambiguous as it can be positive as well. An explanation is that the entry of new firms increases the demand for labor and in the limit, may push up salaries. In addition, higher wages mean more purchasing power and higher consumption, larger markets and more profits opportunities that raise incentive to entrepreneurship.

**Hypothesis 1b:** there is a reverse causality in the relationship between private salaries and entrepreneurship.

The argument of a “survival behavior” could also justify that higher salaries in the public sector attract talented persons that would normally fit to private entrepreneurship. Nonetheless, Acemoglu and Verdier (1998) show that in a context of a corrupt bureaucracy and of failure in the enforcement of contracts, a higher public sector pay has a positive impact on the allocation of talent toward entrepreneurship (less misallocation toward public sector).

This is because higher pays reduce bureaucrats' temptation to corruption (illegal and risky), and this improves the enforcement of contracts.<sup>4</sup> This in turn makes private investments more profitable which lowers incentive to apply for jobs in the public sector.

**Hypothesis 2:** In a context of corrupt bureaucracy, higher public wages reduce the temptation to corruption and this has a positive impact on entrepreneurship.

Corruption is likely to harm entrepreneurship, due to its detrimental effect on financial resources available for new ventures, and as it often comes along with an over-development of the red tape. On the one hand, it is well known since Schumpeter (1911) that the availability of financial resources is essential for the development of new ventures. On the other hand, corruption discourages foreign direct investment (Mauro, 1995; Wei, 2000) and harms the development of a country's financial infrastructures (La Porta, Lopez-de-Silanes, and Shleifer, 1999).

Desai and Acs (2007) and Dreher and Gassebner (2007) show that an overwhelming red tape (e.g. number of procedures and minimum size of capital required to start a business) is a barrier to the entry of firms. As an example, Desai and Acs (2007) quote the prohibitive costs required from entrepreneurs for obtaining license to start a business in Angola, Sierra Leone and Rwanda. Shleifer and Vishny (1993) explain that an excessive red tape can be the outcome of corruption. They argue that corrupt bureaucrats, willing to extort bribes from firms, use their discretionary power in order to customize the red tape, according to firms' ability to pay, and so as to pressure and racket them. This seems to fit to the context of corruption in Indonesia as we shall explain at the end of this section.

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<sup>4</sup> See also Wei 2000 and Svenson (2005) who discuss the effect of higher public wages as a tool to reduce corruption incentive in bureaucracy.

**Hypothesis 3a:** Corruption has a negative impact on the entry of new ventures.

**Hypothesis 3b:** excessive bureaucratic burden and red tape are detrimental to productive entrepreneurship.

As we have explained earlier, the negative effect of corruption has been challenged by a grease-the-wheel assumption posited by Lui (1985) and who explains that bribe payments can permit to reduce long administrative delays and excessive regulations.

Dreher and Gassebner (2007) support empirically this grease-the-wheel effect on entrepreneurship. In a cross countries study, they show that corruption is beneficial to entrepreneurial activity in the countries with the highest level of the red tape regulation.

**Hypothesis 4:** In presence of rent extortion and overwhelming red tape, bribing facilitates the entry of a new business venture. This is a grease-the-wheel effect for entrepreneurship.

Estrin and Prevezer (2010), Puffer et al. (2010), and Tonoyan et al. (2010) consider that informal institutions are also relevant determinants of the entry of new ventures. Vial (2012) brings similar conclusion in the case of family business venturing in Indonesia.

Tonoyan et al. (2010) explain that on the one hand, *Closed social networks* have positive effects on business and on firms' performances, thanks to lower transaction and search costs, lower risk and more trust. But on the other hand, and following Putnam, Leonardi and Nanetti (2000), they admit that the effect can be negative as well. Indeed, Tanzi (1998 p.4) asserts that "social intimacy creates the environment that promotes corruption". Tonoyan et al. (2010) conclude that when entrepreneurs practice their business transactions within closed social networks, characterized by kinship, friendship or ethnicity, the inclination to corruption increases. In the particular case of Indonesia, Pal (2010) classifies communities as having a

“traditional collectivist culture” if they strictly adhere to ‘Adat’ traditional laws and to the Islamic religion.<sup>5</sup>

**Hypothesis 5:** we expect that closed social networks, characterized by religion, ethnicity and the respect of ‘Adat’ traditional rules, increases the inclination to corruption and be detrimental to entry.

### **3 Business and corruption in Indonesia**

A high degree of corruption has prevailed for a long time in Indonesia and things seem to have even worsened after the fall of former president Suharto, in the context of an ambitious political decentralization implemented since 2001. Henderson and Kuncoro (2011) describe a pervasive corruption with a lot of players at many levels: at the central level of the government, ministries and parliament, and at the local levels of regional parliaments, governments, city hall, police officers and militaries. “In addition, decentralization has led to the creation of new local regulations in the form of taxes, levies, licenses and permits, which in turn have driven up corruption at the local level. The phenomenon is called ‘overgrazing the commons’, because it involves officials from all level of government and many agencies preying on the same economic activities” (Kuncoro 2008, p. 3).

Henderson and Kuncoro (2011) describe in detail the business to bureaucracy corruption, and explain than it has many similarities with what prevailed during Suharto. Officially, firms must have locally-set licenses. These are licenses to operate, to export, to import, to invest, to use particular types of machinery, to make noise, to create traffic congestion, to pollute (different sort of pollutions). In addition, they have to pay levies for example to operate an escalator, a water pump, etc. Officials of the local ministry of industry inspect firms in order

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<sup>5</sup> Pal (2010) explains that Adat communities refer to autonomous groups of indigenous people who are able to manage their lives with their own regulations and social control. Adat laws are a set of local and traditional norms which lays the foundation for a collectivist culture (Pal 2010, p.3).

to check that they have their licenses and have paid their levies. Firms pay bribes, to local officials working for ministries (regional or federal), so as to reduce the waiting time for the issuance or the renewal of these licenses and/or so as to avoid harassment when a license has expired. They also pay bribes to reduce their corporate taxes (income), or for the procurement of public (infrastructure) projects. They pay bribes to the police who practices extortion, and to the army in exchange for 'protection'. They also pay so as to shorten the duration of inspections by bureaucrats, or in order to avoid that the inspectors claim for another license or levy that is in fact not relevant in the case of the firm.

A common form of harassment used by officials of the local ministries of industry and of labor, in order to elicit bribes payments, is to inspect firms to monitor if they have all the necessary safety equipments and disposals, and if they comply tightly with all the labor legislations (end of contracts and layoffs, overtime pay, strikes...) (Henderson and Kuncoro 2011, p.165). Since 2001, new labor laws have rendered the legislation more favorable to employees, and firms are paying more bribes to local officials in order to turn around the labor legislation and to obtain more favorable treatment in case of dispute with employees.

Firms must also obtain from city's authorities land "site permits" allowing the acquisition of land for the development of a new plant. Business pay bribes to politicians in order to get these permits.

According to the World Bank *Doing Business Indicators*, in 2006, Indonesia ranked 115 (out of 155 countries) for the overall easiness of doing business and 144 for the easiness of starting a business (see table 1). That year, 151 days were necessary in order to go through the 12 procedures mandatory for forming a legal entity. In comparison, it took in average only 56 days in the World, 54 days in East Asian and Pacific countries and 20 days in OECD countries. To understand this long delay, McLeod (2006) explains that entrepreneurs have to

deal with slow moving bureaucrats from many different administrations: departments of Justice, of Labor, of industry; local tax office and police; social security agencies and so on.

**Table 1: Ease of doing and starting a business in Indonesia - 2006**

		Rank (155 countries)
<b>Overall ease of doing business</b>		115
<b>Starting a business</b>		144
<i>Cost (% of income per capita)</i>	101.7%	121
<i>Time (days)</i>		
Indonesia	151	149
World	56	
East-Asia & Pacific	54	
OECD	20	

*Source: World Bank (2006)*

According to a survey conducted by Transparency International Indonesia (2008) on 4000 persons, with 3841 respondents including 2700 business persons, the main motives of bribe payments are speeding up bureaucratic processes and getting public contracts, business permits and favorable judicial decisions.

#### **4 Data and methodology**

We use data from two panel datasets. The first is the *Statistik Industri* which is a census of Indonesian industrial plants, with an average of 22,000 plant-year observations per year over the period 1993-2007. It covers 371 5-digits subsectors of the manufacturing industry, located in 430 districts of 33 provinces of Indonesia. The data originates from an annual survey, anonymous, conducted by the Indonesian bureau of public statistics (BPS), covering establishments with 20 employees and more. Data include detailed plants' characteristics such

as age, output, inputs use, expenditures, ownership, etc. One item, titled “gifts, charities and donation”, is admitted as a proxy indicator of bribe payments by Indonesian plants (Behrman and Deolalikar 1989; Vial and Hanoteau 2010).

The second panel dataset is the Indonesia Family Life Survey (Frankenberg and Thomas, 2000; Strauss et al., 2004). It gathers the answers of thousands of households who underwent four rounds of comprehensive interviews between 1993 and 2007, in provinces accounting for 83% of the total Indonesian population.

Our analysis used ordinary least square regressions as well as instrumental variable techniques to account for potential circular causalities. We are able to use a panel dataset covering two periods (2000, 2007), the 371 manufacturing subsectors, in 261 districts from 22 provinces, with different institutional quality data.

## Econometric model

In order to verify our empirical assumptions, we test the following model:

$$\begin{aligned}
 \text{Entry rate}_{i,k,t}^{A,NB,B} = & \\
 & a_0 + a_1 \text{Av. private wage}_{k,t} + a_2 \text{Av. public wage}_{k,t} + a_3 \text{Av. bribes}_{i,k,t} \\
 & + a_4 \text{Market size}_{i,k,t} + a_5 \text{Av. plant size}_{i,k,t} + a_6 \text{Industry concentration}_{i,k,t} \\
 & + a_7 \text{Underprovision of public in frastructures}_{r,t} + a_8 \text{Av. education} + a_9 \text{Urbanization}_{r,t} \\
 & + a_{10} \text{Public ownership}_{i,k,t} + a_{11} \text{Av. indirect taxes}_{i,k,t} + a_{12} \text{Business permits delivery}_{r,t} \\
 & + a_{11} \text{Ethnic fragmentation}_{k,t} + a_{12} \text{Islamic religion}_{k,t} + a_{13} \text{Traditional rules}_{r,t} + \mu_{i,k,t}
 \end{aligned}$$

Variables with indices  $i$  and  $k$  are measured at the 5-digits industry level  $i$  and at the district (kabupaten) level  $k$ . Variables with the indices  $r$  are taken at the province level. All variables have the indices  $t$  which denote the measurement year 2000 or 2007.  $\mu_{i,k,t}$  is an error term.

The exponent  $A$ ,  $NB$  and  $B$  on the dependent variable *Entry rate* denote that we use three alternative dependent variables in three series of regressions. The exponent  $NB$  indicates the rate of entry of non-bribing plants over the population of plants. The exponent  $B$  is for the rate of entry of bribing plants over the all population of plants. The exponent  $A$  is for the rate of entry of all plants, bribing and non-bribing. The next table presents in detail the construction of the variables and their sources. The fact that the BPS database covers only plants with 20 employees or more might have been a problem for the computation of the entry rate. In fact, checking with plants' age reveals that new entrants in the database are new-born plants, except for a very little number of exceptions.

We take the average bribes paid by the plants of a sub-sector (5-digits) of a regional district, as an indicator of the level of corruption and rent-seeking in that district-subsector. So as to avoid circular causality, the average bribes are calculated excluding the bribes paid by the new entrants of that year.

We take the average indirect taxes paid by plants of a subsector in a district and the quality of *Business permits delivery* as perceived in a province, as indicators of bureaucratic burdens and of the red tape. In the BPS dataset, the variable 'indirect taxes payment' encompass sales taxes, establishment licenses, building and land taxes, annual motor vehicle taxes, import duties, as well as custom fees.

*Ethnic fragmentation*, religion fragmentation (*Islamic religion*) and the respect of 'Adat' *Traditional rules* are indicators of closed social networks.

Following the literature on the determinants of entry of new ventures, we add a series of variables of control. We first include the *Market size*. According to Murphy, Shleifer and Vishny (1991), being a talented entrepreneur pays more in a larger market than in a smaller one, and therefore, large markets attract more talent, which raises entry.

The level of *Industry concentration* should have a negative effect on entry, as in more concentrated industries, markets are less contestable, with dominant incumbent eventually acting strategically so as to deter new entry. In addition, this situation can be the outcome of the corruption system, with incumbent firms benefiting from the ‘protection’ of corrupt top officials.

On the one hand, the *Average size of plants* should have a positive effect on entry. According to Tonoyan et al. (2010), large firms can better resist to corruption (extortion) thanks to lobbying and political connections, whereas small ones are more vulnerable to corruption and more likely to suffer from it. Furthermore, Murphy, Shleifer and Vishny (1991) explain that the red tape restricts the freedom to expand firm size, and therefore this lowers the average size of firms as the ablest people have lower incentive to become entrepreneurs. On the other hand, a smaller average size may reveal, like *Industry concentration*, a more competitive and contestable market, beneficial to entrants.

We expect that *Firm ownership* has a positive effect on entrepreneurship. Assuming that state-owned plants, or plants with a public participation, are treated better by state agencies and that this benefits their entire subsector, this should raise entrepreneurs’ incentive.

The economic geography literature explains that infrastructures and services such as transportation, communication and health are determinants of the location of investment. Therefore, we expect that the *Under-provision of public infrastructures, facilities and services* (health, transportation, sanitation, public lighting, clean water, road and education) has a negative impact on entrepreneurship.

Verheul et al. (2002) and Freytag and Thurik (2007) explain that the structural characteristics of the population impact entrepreneurship. We expect that a higher level of *Average education* has a positive effect (Sobel 2008) and the same for *Urbanization* rate of the population. The sources and the construction of the variables are described in detail in table 2.

**Table 2: variables description and sources**

<i>Variable</i>	<i>Description</i>	<i>Source</i>
Entry rate <sup>A</sup>	Number of entrants during the period over the total number of plants at the beginning of the period, at the 5-digit sector and district levels.	BPS
Entry rate <sup>NB</sup>	Number of entrants, not offering bribe, over the total number of plants, at the 5-digit sector and district levels.	BPS
Entry rate <sup>B</sup>	Number of entrants, offering bribe, over the total number of plants, at the 5-digit sector and district levels.	BPS
Average private wage	Salary in the private non-farming sector, average at the district level (log).	RAND IFLS households survey
Average public wage	Salary of persons working for (local, regional, national) governments. Average at the district level (log).	RAND IFLS households survey
Average bribes	Plant's payment of bribes, average at the sector (5-digit) and district levels (log), excluding new entrants of the year.	BPS
Market size	Total output aggregated at the sector (5-digit) and district levels (log).	BPS
Average plants' size	Average number of employees at the sector (5-digit) and district levels (log).	BPS
Industry concentration	Herfindahl-Hirschman Index of output concentration, calculated at the sector (5-digit) and district levels (log)	BPS
Average education	Level of school attainment of heads of households. Average at the district level (log).	RAND IFLS households survey
Average indirect taxes	Plant's payment of indirect taxes, averaged at the sector (5-digit) and district levels (log).	BPS
Public ownership	Percentage of plants with a public participation in ownership, at the sector (5-digit) and district levels.	BPS
Business permits delivery	Heads of community's perception of the quality of business permits delivery by the administration. Value between 1 and 4, 4 meaning lower quality. Weighted average at the regional level, using community population as weighting parameter (log).	RAND IFLS community survey
Ethnic fragmentation	Standard deviation, at the district level, of the ethnicity of households heads (log).	RAND IFLS households survey
Islamic religion	Percentage of households heads that are islamist, at the district level.	RAND IFLS households survey
Traditional rules	Community heads' opinion on the respect of 'Adat' traditional rules (dummy = 1 if strict respect). Weighted average at the regional level, using community population as weighting parameter. Higher value means more respect (log).	RAND IFLS community survey
Under-provision of public infrastructures, facilities & services	Heads of community's perception of the quality of provision of health, transportation, sanitation, public lighting, clean water, road and education services in their village. Each of the seven indicators takes value between 1 and 4, 4 meaning lower quality. an aggregated index is built using the principal component method. Weighted average at the regional level, using community population as weighting parameter (log).	RAND IFLS community survey
Urbanization	Percentage of population in urban areas, at the province level.	RAND IFLS community survey
District government corruption	Community heads' opinion on the corruption of district government (dummy = 1 if think corrupt). Weighted average at the regional level, using community population as weighting parameter. Higher value means more corruption (log).	RAND IFLS community survey

The Tables 3 and 4 present respectively summary statistics and the matrix of correlations. It reveals collinearity between *Public* and *Private wages* measures. Instrumenting *Private wages* for the reverse causality mentioned earlier, is likely to turn this problem. We instrument the variable Average private wages using a measure of the average income (of households) at the

district level, and the average ratio of white collar employees to total employees in the manufacturing sector (district level).

We use panel data estimation techniques, and following the results of Hausman test, not shown here, we choose a fixed effect model specified at the 5-digit sector level.

**Table 3: Summary statistics**

[Insert here]

**Table 4: Correlation matrix**

[Insert here]

## **5 Results**

The table 5 presents the results of OLS regressions of the model. They are very similar to those obtained with IV regressions and presented in the table 6, and we comment these last results.

**Table 5: Results of OLS regressions**

[Insert here]

The results on table 6 confirm that the structure of rewards impacts entrepreneurship. The positive and significant coefficient for *Average public wages* (columns 1 and 3) supports Acemoglu and Verdier (1998) assumption that higher salaries reduce civil servants' temptation to corruption and is therefore beneficial to entrepreneurship. The fact that the

relation holds for bribing new ventures and not for non-bribing ones, reinforces further this idea. Kuncoro (2004) explains that corrupt bureaucrats target and extort bribes from firms that have the highest ability to pay. In order to extort bribes, they develop the red tape. Therefore, the bribing plants that are racketed because of their relatively higher “ability to pay bribes”, are likely to be the ones suffering the most from the corruption system.<sup>6</sup> And, a reduction in the burden of corruption, due to higher civil servants’ pay, may benefit more the bribing plants that are racketed, and improve relatively more entrepreneurship in this cohort.

The sign of the estimated parameters for *Average private wages* is negative and significant in column 1 and 3. This confirms the survival behavior, that lower pays in the private sector may encourage entrepreneurship as a source of alternative employment, but mainly for bribing new ventures according to our results.

The bribes paid in average by plants of a subsector in a district, can be considered as an indicator of the magnitude of corruption and of rent seeking in that district for that subsector. The negative and significant coefficient for non-bribing new ventures (column 1) suggests that a higher magnitude of the corruption system is a barrier to entry, thus confirming the hypothesis 3a.

However, the positive coefficient in column (3) suggests that the opposite effect holds for the class of bribing new ventures. In presence of a higher level of corruption, the entry rate of bribing plants is higher.

This suggests the positive effect (on entry) of bribe payments by new ventures, in a context of corruption. Bribes enable plants to fasten the delivery of administrative permits (building, business operations), to avoid (abusive) taxations and delays, to reduce time spent with bureaucrats, thus validating the hypothesis 4 of a grease-the-wheel effect for the entry of new ventures.

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<sup>6</sup> This is also because corruption acts like an additional charge on firms, but more distorting than regular official taxes (Wei, 2000).

The negative and significant estimated coefficients for the variables *Business permits delivery* and *Average indirect tax* reveal that a lower quality in the delivery of permits (more barriers and delays) and higher indirect taxes are detrimental to the entry of firms, supporting the hypothesis 3b. However, the coefficient for *Business permits delivery* is not significant in the case of non-bribing new ventures (column 2), suggesting that they are less exposed than bribing ones. An explanation may rest on Shleifer and Vishny (1993) and Barnerjee (1997) theoretical assumption, and on Henderson and Kuncoro (2011) description in the case of Indonesia, that predatory bureaucrats exploit their discretionary power over the red tape so as to extort bribes, and that they customize it according to firms' ability to pay. Kuncoro (2004, p.336) suggests such a differentiated treatment between firms by stating that: "the more profitable the firm, the higher the bribes it will pay". In our case, the more profitable new ventures face more difficulties to obtain business permits and they pay bribes so as to avoid these difficulties.

*Ethnic fragmentation*, which is another variable characterizing informal institution, also has a differentiated effect on the two cohorts of new ventures. It has a positive effect on entry rate, but only significant in the case of bribing plants (column 3). This is consistent with the view that social intimacy created by closed social networks (here, thanks to homogenous ethnicity) may increase the inclination to corruption (Tanzi, 1998; Putnam et al., 2000; Tonoyan, 2010) and bring negative effects such as impediment to new firms entry. This supports the assumption 5. It is also supported with the variable *Islamic religion*. Its estimated coefficient is always negative and significant, suggesting the detrimental effect of closed social networks and collectivist culture on entry.

The respect of traditional 'Adat' rules has always a positive and significant impact on entry rate. This is contrary to our hypothesis 5 and may reveals that in the case of traditional laws, the main effect of bonding networks is a high level of trust that is ensured by the respect of

these laws. And trust is known to have of positive impact on entrepreneurship (Tonoyan et al. 2010). In addition, trust is necessary even in the relation of corruption, which is a particular form of contract.

Among the control variables, *Urbanization* has always a positive and significant impact on entry, as expected. The estimated parameter for *average plant size* is always negative and significant, suggesting that competition and contestability favor entry. This is confirmed with the variable *Industry concentration*. It has a negative and significant effect on entry for the cohort of non-bribing entrants (column 2), but null and not significant in the case of bribing ones (column 3). This suggests that bribing, and the favors granted in return, compensate a lack of competition. This lack can also be the outcome of bribing by an entrant willing to get a dominant position, for example, by obtaining a license of exclusivity.

This result highlights how bribing and corruption distort the effect of institutions on entry. We observe it further with the variable *Under-provision of public infrastructures*. It has a negative and significant effect on the entry of non-bribing entrants, as expected, but positive on bribing ones. This suggests that briberies and their accompanying favors, compensate the paying entrants for the under-provision of public infrastructures, in the form of a privileged access for example.

The *Market size* has a positive and significant impact on entry, as expected, but only in the case of non-bribing plants, underlining further the dichotomy between bribing and non-bribing new ventures.

*Public ownership* is of the expected positive sign but not significant, and the *Average education* level is never significant.

## Table 5: Results of IV regressions

[Insert here]

### *Robustness checks*

We use an alternative measure of corruption taken from the Rand IFLS community survey database. It is the village heads' perception of corruption at the level of district governments. Given similar origin and construction, this variable is quite correlated with *Under-provision of public infrastructures*, with *Urbanization*, and with *Ethnic fragmentation*. This is why we omit these last three variables in the regressions. The columns 4, 5 and 6 of tables 5 and 6, show that the results remain robust.

To handle further the collinearity problem between *Public* and *Private wages*, we replace our measure of *Public wages* by an alternative measure. We use the regional average of communities' *routine expenditures share* in total budget. Routine expenditures encompass village staff salaries, official trip, office maintenance, expenditures in goods and conveniences. The results, not shown here, are robust.

We remove potential severe outliers from the sample following the Hadi multivariate outliers detection method (Hadi, 1992). Using the standard 5% significance level for outliers cutoff lead us to exclude only 28 observations and regressions results with the new sample, not shown here, remain robust. There is no theoretical reason to exclude these observations but this procedure provides a good robustness check.

## **6 Conclusion**

In this paper, we have extended Baumol's (1990) theory of productive and unproductive entrepreneurship, by assuming that a talented agent can choose to become a productive entrepreneur offering bribes. He can also decide to work for a private company or as a civil servant. We then use this framework to investigate empirically on the effect of the quality and features of formal and informal institutions on new business venture in Indonesian manufacturing, for the years 2000 and 2007, and how plant level corruption impact these relations.

Testing the Baumol's (1990) extended theory, we evidence a grease-the-wheel effect in entrepreneurship as a higher level of average bribes explains significantly a higher rate of new entry of bribing ventures. On the other hand, non-bribing ventures suffer from the existence of a higher level of corruption in their sector and district. This result does not affirm that corruption is costly for societies, as a source of inefficiencies and wasting resources. But it underlines the 'second-best' properties of bribes, from the perspective of a single entrepreneur, who faces even more costly distortions such as overwhelming red tape and inefficient bureaucracy.

We find that in presence of corruption in a sector/district, higher pays in the public sector in that district have a positive impact on entrepreneurship, which confirms earlier recommendations to increase civil servants' salaries so as to reduce inclination to corruption.

In addition, we show that formal and informal institutions impact differently entry depending on whether new ventures are bribing or not. This supports the relevance of our extension of Baumol's theory.

We find that the strict respect of Adat traditional rules has a positive impact on entrepreneurship, even in the case of bribing new ventures. This underlines at least one

success, in terms of its effect on corruption, of the decentralization reform implemented since 2001. Indeed, it has re-authorized the use of these Adat traditional laws (Pal, 2010).

This study offers important practical implications for policies targeting development through the fostering of entrepreneurship. It reaffirms the importance of good quality institutions and of carefully designing the characteristics of local governance, regulation and tax system, so as to offer fair and motivating rewards to productive entrepreneurial activities. By shedding light on the complex interactions between institutional features, bribe payment and productive entrepreneurship, this study also reaffirms that these three aspects have to be the integrated objectives of a same development policy.

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**Table 3: Summary statistics**

	Mean	Standard deviation	Observations
Entry rate All sample	0.041	0.166	13229
Entry rate bribing	0.016	0.104	13229
Entry rate non-bribing	0.025	0.129	13229
Average public wage (log)	16.381	0.748	10379
Private wage (log)	15.630	0.744	11818
Average bribe payment (log)	7.338	4.671	13229
Market size (log)	18.005	2.466	13229
Average plant size (log)	4.356	1.152	13229
Industry concentration (log)	8.802	0.595	13229
Under-provision of public infrastructures	-0.402	0.595	13229
Average education (log)	0.612	0.237	11670
Urbanization (%)	0.769	0.124	12082
Public ownership	0.303	0.431	13229
Average indirect tax payment (log)	9.026	4.977	13229
Business permits delivery (log)	0.164	0.192	12082
Islamic religion (%)	0.891	0.085	11670
Traditional rules (log)	-1.533	0.731	11497
Ethnic fragmentation (log)	2.050	0.861	11510
District government corruption (log)	0.439	0.141	12082

**Table 4: Correlation matrix**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Entry rate All sample	1.0000																	
2 Entry rate bribing	0.6296*	1.0000																
3 Entry rate non-bribing	0.7790*	0.0034	1.0000															
4 Average public wage (log)	0.0119	0.0392*	-0.0162	1.0000														
5 Average private wage (log)	-0.0183*	0.0388*	-0.0539*	0.6072*	1.0000													
6 Average bribe payment (log)	-0.0262*	-0.1231*	0.0656*	0.1290*	0.0964*	1.0000												
7 Market size (log)	-0.0566*	-0.0066	-0.0675*	0.2396*	0.3819*	0.2398*	1.0000											
8 Average plant size (log)	-0.0779*	-0.0464*	-0.0628*	-0.0048	0.0894*	0.1173*	0.6916*	1.0000										
9 Industry concentration (log)	-0.0121	-0.0009	-0.0149	0.0093	0.0223*	-0.2344*	-0.2639*	0.0162	1.0000									
10 Under-provision of public infrastructures	0.0285*	0.0034	0.0334*	0.1031*	0.0897*	0.0303*	0.0361*	-0.0144	0.0169	1.0000								
11 Average education (log)	-0.0016	0.0284*	-0.0246*	0.3214*	0.4189*	0.0610*	0.1414*	0.0168	-0.0059	0.0743*	1.0000							
12 Urbanization (%)	-0.0086	-0.0009	-0.0102	0.0284*	0.2121*	0.0031	0.1051*	0.0361*	-0.0256*	-0.1276*	0.2125*	1.0000						
13 Public ownership	0.0239*	-0.0410*	0.0639*	-0.4805*	-0.5906*	0.0348*	-0.2913*	-0.0065	-0.0622*	-0.0304*	-0.1403*	-0.0878*	1.0000					
14 Average indirect tax payment (log)	-0.0455*	-0.0832*	0.0086	0.1550*	0.1469*	0.5133*	0.3386*	0.2405*	-0.1842*	0.0803*	0.1180*	0.0032	0.0576*	1.0000				
15 Business permits delivery (log)	0.0085	0.0235*	-0.0072	0.0797*	0.0133	0.0145	0.0103	-0.0065	-0.0054	0.3348*	-0.0861*	-0.2793*	-0.0032	0.0251*	1.0000			
16 Islamic religion (%)	-0.0303*	-0.0326*	-0.0129	0.1604*	0.0308*	0.0068	0.0669*	0.0451*	0.0234*	-0.0443*	-0.1327*	-0.0110	-0.0861*	0.0124	0.0605*	1.0000		
17 Traditional rules (log)	0.0318*	0.0329*	0.0152	0.0024	0.0107	-0.0138	0.0043	-0.0576*	0.0353*	0.2111*	-0.0995*	-0.3677*	-0.2371*	-0.0070	0.3139*	0.0224*	1.0000	
18 Ethnic fragmentation (log)	0.0175	0.0154	0.0101	0.1875*	0.1505*	0.0121	-0.0042	-0.0491*	-0.0079	0.2182*	0.4388*	0.0783*	-0.0266*	0.0421*	-0.0728*	-0.3670*	-0.0761*	1.0000
19 District government corruption (log)	0.0138	0.0006	0.0170	0.1592*	0.1313*	0.0304*	0.0991*	0.0787*	-0.0027	0.4109*	0.1888*	-0.1247*	0.0531*	0.0772*	-0.0818*	-0.0479*	-0.5717*	0.2475*

\* is significant at 5% level.

**Table 5: Results, OLS regressions**

	(1)	(2)	(3)	(4)	(5)	(6)
<i>dependent</i>	Entry rate all sample	Entry rate non-bribing plants	Entry rate bribing plants	Entry rate all sample	Entry rate non-bribing plants	Entry rate bribing plants
<i>explanatory</i>						
Average public wage (log)	0.008** (0.012)	0.001 (0.660)	0.007*** (0.004)	0.009*** (0.005)	0.000 (0.835)	0.009*** (0.001)
Average private wage (log)	-0.006 (0.239)	0.003 (0.185)	-0.009** (0.047)	-0.002 (0.640)	0.004* (0.056)	-0.006 (0.145)
Average bribes (log)	0.000 (0.609)	-0.003*** (0.000)	0.002*** (0.000)			
District government corruption (log)				0.004 (0.645)	-0.010* (0.055)	0.015* (0.056)
Market size (log)	0.001 (0.589)	0.003** (0.002)	-0.002 (0.352)	0.001 (0.556)	0.002** (0.011)	-0.001 (0.537)
Average plant size (log)	-0.008** (0.044)	-0.006*** (0.001)	-0.002 (0.503)	-0.008** (0.039)	-0.005*** (0.002)	-0.003 (0.363)
Industry concentration (log)	-0.005 (0.135)	-0.003* (0.068)	-0.002 (0.462)	-0.005* (0.093)	-0.002 (0.209)	-0.003 (0.178)
Under-provision of public infrastructures	0.003 (0.467)	-0.005*** (0.002)	0.008** (0.015)			
Average education (log)	-0.016* (0.075)	0.005 (0.283)	-0.021*** (0.010)	-0.009 (0.259)	0.007 (0.123)	-0.016** (0.030)
Urbanization (%)	0.074*** (0.001)	0.030*** (0.003)	0.044** (0.017)			
Public ownership (%)	0.019*** (0.003)	0.004 (0.144)	0.015*** (0.008)	0.019*** (0.003)	0.003 (0.210)	0.016*** (0.005)
Average indirect taxes (log)	-0.002*** (0.000)	-0.001*** (0.000)	-0.001* (0.067)	-0.002*** (0.000)	-0.002*** (0.000)	0.000 (0.406)
Business permits delivery (log)	-0.042*** (0.000)	-0.003 (0.444)	-0.039*** (0.000)	-0.034*** (0.005)	-0.010** (0.039)	-0.024** (0.016)
Ethnic fragmentation (log)	0.003 (0.166)	0.000 (0.926)	0.003* (0.079)			
Islamic religion (%)	-0.057** (0.020)	-0.034** (0.034)	-0.024 (0.187)	-0.066*** (0.005)	-0.032** (0.024)	-0.034* (0.061)
Traditional rules (log)	0.016*** (0.000)	0.007*** (0.000)	0.009*** (0.000)	0.012*** (0.000)	0.003* (0.099)	0.010*** (0.000)
Constant	0.090 (0.269)	-0.005 (0.906)	0.095 (0.164)	0.082 (0.307)	-0.018 (0.638)	0.010 (0.144)
Observations	8948	8948	8948	8948	8948	8948
adj. R <sup>2</sup>	0.012	0.025	0.016	0.011	0.015	0.009

Robust standard errors. Regressions include an industry fixed effect. p-values in parentheses

\* significant at 10%. \*\* significant at 5%. \*\*\* significant at 1%

**Table 6: Results, IV regressions**

	(1)	(2)	(3)	(4)	(5)	(6)	
<i>explanatory</i>	<i>dependent</i>	Entry rate all sample	Entry rate non-bribing plants	Entry rate bribing plants	Entry rate all sample	Entry rate non-bribing plants	Entry rate bribing plants
Average public wage (log)		0.012*** (0.001)	0.000 (0.874)	0.012*** (0.000)	0.013*** (0.001)	0.001 (0.592)	0.011*** (0.000)
Average private wage (log)		-0.022** (0.022)	0.005 (0.385)	-0.027*** (0.001)	-0.015* (0.084)	0.001 (0.895)	-0.016** (0.029)
Average bribes (log)		0.000 (0.609)	-0.003*** (0.000)	0.002*** (0.000)			
District government corruption (log)					0.004 (0.698)	-0.011* (0.051)	0.014* (0.063)
Market size (log)		0.003 (0.146)	0.003*** (0.004)	0.000 (0.834)	0.002 (0.152)	0.003*** (0.005)	0.000 (0.861)
Average plant size (log)		-0.009*** (0.001)	-0.006*** (0.001)	-0.004* (0.093)	-0.009*** (0.001)	-0.005*** (0.001)	-0.004* (0.074)
Industry concentration (log)		-0.003 (0.314)	-0.003* (0.059)	0.000 (0.999)	-0.004 (0.195)	-0.002 (0.323)	-0.002 (0.358)
Under-provision of public infrastructures		0.002 (0.530)	-0.005*** (0.001)	0.006** (0.017)			
Average education (log)		-0.007 (0.548)	0.004 (0.456)	-0.010 (0.277)	0.000 (0.998)	0.009* (0.070)	-0.009 (0.342)
Urbanization (%)		0.093*** (0.000)	0.027** (0.023)	0.066*** (0.002)			
Public ownership (%)		0.010 (0.190)	0.005 (0.194)	0.005 (0.458)	0.011 (0.121)	0.001 (0.729)	0.0101 (0.107)
Average indirect taxes (log)		-0.002*** (0.000)	-0.001*** (0.001)	-0.001* (0.090)	-0.002*** (0.000)	-0.002*** (0.000)	0.000 (0.221)
Business permits delivery (log)		-0.043*** (0.000)	-0.003 (0.493)	-0.040*** (0.000)	-0.034*** (0.005)	-0.010** (0.039)	-0.024** (0.032)
Ethnic fragmentation (log)		0.003 (0.132)	0.000 (0.929)	0.003** (0.049)			
Islamic religion (%)		-0.068*** (0.004)	-0.032** (0.029)	-0.035* (0.053)	-0.075*** (0.001)	-0.034** (0.011)	-0.041** (0.020)
Traditional rules (log)		0.0166*** (0.000)	0.007*** (0.000)	0.010*** (0.000)	0.012*** (0.000)	0.003 (0.113)	0.009*** (0.001)
Constant		0.238** (0.043)	-0.022 (0.757)	0.260*** (0.005)	0.208 (0.271)	0.013 (0.849)	0.195** (0.034)
Observations		8944	8944	8944	8944	8944	8944
Kleibergen-Paap Wald <i>F</i> -statistic (weak identification test of the excluded instruments)		774.82 (0.829)	774.82 (0.617)	774.82 (0.617)	806.53 (0.758)	806.53 (0.490)	806.53 (0.428)
Hansen <i>J</i> test of overidentifying restriction, <i>p</i> -value		5.25	0.43	5.81	1.50	0.24	2.58
Anderson-Rubin Wald <i>F</i> -statistic (test of joint significance of endogenous regressors)		856.75 (0.000)	856.75 (0.000)	856.75 (0.000)	857.70 (0.000)	857.70 (0.000)	857.70 (0.000)

Robust standard errors. Regressions include an industry fixed effect. *p*-values in parentheses excluded instruments are average income (district level) and white-collar-ratio (5-digit industry/district level)

\* significant at 10%. \*\* significant at 5%. \*\*\* significant at 1%