Corruption, Governance and Firm Performance: Evidence from the Indian Enterprises

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Abstract

Some recent incidences of corruption and tax evasion in India have attracted much of the attention and initiated debate on these issues. Motivated by these developments, this study intends to examine two important issues. First, we test the impact of bribe payment on firm's performance. Specifically, we emprically investigate two important but alternative hypoheses, namely 'grease the wheels' and 'sand the wheels'. Second, we intend to quantify firms which must pay bribe. We use the enterprises survey data of the World Bank. The survey was conducted on Indian manufacturing in collaboration with a prominent local industry body in 2005-2006. Our overall findings regarding the effects of bribe on firm's performance are found to be rather mixed. We find that bribe works as tax on profitability of firms and provides incentives for inefficiency. However, the evidence is inconclusive on productivity, as we fail to establish any direct impact of bribe on the productivity. On the other hand, bribing seems to have a positive effect for the firm's exporting performance. Therefore, the evidence provides support for both the hypotheses.Findings regarding who must pay bribe reveal that tax evading firms are likely to pay more bribes to the government officers. Furthermore, policy impediments are important source of incidents of bribe payment. Thus we argue that it is the complexity in the system (policy or bureaucratic) which tends to raise the probability of paying bribes and also dampen the performance.

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1. Introduction

Some recent incidences of corruption and tax evasion in India have drawn attention of the public on a large scale and initiated extensive debate on these issues. The recent disclosers by the Comptroller and Auditor-General (CAG) of the country have highlighted the malpractices in various government auctions of licensing and tenders, which have caused loss of several billion US dollar to the exchequer in the relatively poor country. These scams have drawn attention to the widespread and unholy alliance between politicians, bureaucrats and corporate management. These unraveling led to a series of protest in forms of hunger strikes, street protests and stalls of parliament by the opposition political parties and intellectual societies. In a recent survey report, consultancy firm KMPG[1] observed "At a time when India is aiming for a 9% GDP growth; the rising level of bribery and corruption cases have cast dark cloud over the hard earned success earned by the country over the last two decades. A series of high-level corruption and scams over the past two years are now threatening to derail the country's credibility, especially in the international arena, and the economic boom witnessed especially since liberalization" Furthermore, the related literature also suggests the country has a large shadow economy (see e.g. Chaudhuri et al., 2006). In a recent report, Kar (2010) estimate that tax evasion, crime, and corruption have removed gross illicit assets from India worth US $462 billion. Nevertheless, corruption is not a new phenomenon in India. In two thousand years ago, Kautilya (Chankaya), discusses in details of the menace of corruption in the Indian society in his famous book, Arthashastra.

Corruption performs a substantial role in functioning of economic activities. The term is commonly defined as the misuse of public power for private benefit. The term ''private

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[1]'Corporate India expresses its grievances and expectations from the future'
(http://www.kpmg.com/IN/en/IssuesAndInsights/ThoughtLeadership/KPMG_Bribery_Survey_Report_new.pdf
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benefit'' relates to receiving money or valuable assets, but it may also encompass increase in power or status. Receiving promises for future favors or benefits for relatives and friends may also be considered a private benefit. With regard to favors for relatives and friends, the terms nepotism and favoritism are also common. Drury et al. (2006) define corruption "as the abuse of public office for private gain," whether pecuniary or in terms of status. The gain may accrue to an individual or a group, or to those closely associated with such an individual or group. Corrupt activity includes bribery, nepotism, theft, and other misappropriation of public resources (see Bardhan, 1997, Lambsdorff, 1999, Nye, 1967, Shleifer and Vishny, 1993). The predominant, although not exclusive, view of corruption is that it is damaging to economic performance as both a tax on productivity and a market distortion. It has shown that corruption has significant impact on growth, investment, capital flows, innovation and entrepreneurship.

The above view on corruption is however partial. It primarily refers to those who are in a position to offer favours or facilitate the functioning of others in exchange of personal gains. It is indeed a rent seeking behaviour because one is able to earn a rent on the position and the responsibility that she/he has been entrusted with. However, the other side of the story refers to those who are willing to offer bribes in order to receive undue advantages or favours that the system does not permit under normal situations. Both the bribe takers and bribe givers are to be considered for the determination of the amount transacted though in certain cases it can be purely a bribe takers' market. Other than the favours associated with bribes illegal transactions can also take place because of denial of certain rights to the consumers or producers, particularly in a developing country context. Hence, for a smooth functioning or for enhancing productivity there are individuals who are willing to pay bribes just to secure the minimum legality which is otherwise due under normal circumstances. The permits are due, they are necessary for the activity one is pursuing yet a rent has to be paid because it is

purely a bribe takers' market. In such situations the adverse repercussions on productivity are seen to be much higher than the amount paid in the form of bribes. And thus for the sake of growth one is willing to enclose an undue bribe.

The effects of corruption on growth and development across countries are the subject of much attention in the related research and among policy makers. The literature has shown that at the macro level corruption negatively impacts investment, which in turn hurts economic growth and employment. In a pioneered study, Mauro (1995) observed that it affects investment directly, which finally dampens the economic growth and development. The findings were later supported by Brunetti and Weder (1998), Lambsdorff and Cornelius (2000),Doh and Teegen, (2003). In an important study, Lambsdorff, (2003) has also shown direct impact of corruption on capital inflows. However, some others support the hyposthesis of 'grese the wheels', in which it is argued that corruption may be benefical in the 'second best' world because of the distorations caused by ill-functioning institutions. Furthermore, an inefficent bereucracy constitutes an impediment to investment that some grease money may help circumvent (Leff,1964, Huntingation, 1968 and Leys, 1965). For example, in a case of bribery a smaller or loss making firm may walk away with a governmnet tender or licencing, which is otherwise not possible for it compete with a multinationals. In the persent globlized market, such incidents very often provide life blood for small local firms, which finally lead to better allocative efficency.   The hypothesis is again tested by Meon and Sekkat (2005) and their findings reject the hypothsis of 'grease the wheels' and instaed it supportes the hypothesis of the 'sand the wheels'.

Hence, the issue of whether bribery is harmful or not, is primarily an empirical question. The relationship between growth and corruption has been examined extensively in the macro literature,beginning with Mauro (1995). In general, these studies find a negative correlation between corruption and GDP growth. However, at firm only a few studies has taken this issue

and in the case of india, best of our knowledge none of the study has covered this aspact. In this paper, we take advantage of a unique data set that contains information onthe estimated bribe payments of indian firms. In order to test, the impact of bribe payment on firm performance, we consider four important indicators of firm performance, namely, profit, technical efficiency, labor productivity and export performance. Our emprical models include proxy of a range of important varaibles, i.e. policy hurdles, beaucratic issues, ownership and size of firms are tested to quantitfy their impact as well as control the endogenity.

On the other side, to tackle the corruption between business sector and government agencies, it is relevant to know what determines corruption. Answering this question the standard literature has provided important insights on the aggregate determinants of corruption however it also has some serious drawbacks. First, most of studies have utilized the perception indices as measures of corruption, but use of these indices may be subject to serious perception biases. Second, due to the aggregate nature of the data, it tells us little about the relationship between corruption and individual agents. Most importantly, macro-determinants cannot, by definition, explain the within-country-variation in corruption. Specifically, firms facing similar institutions and policies may still end up paying different amounts in bribes (for the same set of services received). Major breakthrough is taken place in literature, when World Bank Enterprise Surveys started providing firm-level data on this issue. Studies of Svensson (2003), Kenny (2007), Kenyon (2008), Joulfaian (2009), Kenny (2009) Ayyagari et al. (2010) have the database for different countries as well as for the cross-country. Their findings at the firm-level have several firm-specific features which prompt firms to pay bribe. Considering this development, the present study utilizing a firm-level survey data attempts to test the determinants of corruption or bribe payment. In doing so, we examine role of a range variables, i.e. tax compliance, profit, foreign ownership, policy obstacles and bureaucratic complexity which potentially may affect the bribe payment.

For our set objectives in this study, we utilize a unique survey data of the World Bank Enterprise Surveys carried out in 2005-2006 in India. The database covers 2287 Indian enterprises across 22 industries and 37 Indian cities. Specifically, our analysis attempts to understand what leads to bribe payment and whether bribe payment results in better performance level. Though these two aspects need to be tested in a simultaneous equation framework at the moment we have kept them independent of each other. This is partly because of the fact that one of the endogenous variables (bribe payment) is a qualitative variable. The study tests a range of variables, i.e. tax compliance, profit, foreign ownership, policy obstacles and bureaucratic complexity which potentially may affect the bribe payment.

2. Corruption in India

Recent Corruption Perception Index of the Transparency International suggests that India rank 87 in the world with 3.3 points on a scale from 10 (very clean) to 0 (highly corrupt). Further, India's rank is 16 in Asia Pacific region and country is more corrupt than economic and political competitor- China and however less than political competitor Pakistan.

The level of corruption in the country especially relating the business is well covered in the World Bank's Enterprises Survey. This survey covers over 125000 firms operating in 125 countries. In the survey corruption related questions have also been included for the firms. The data (of the survey) could be useful in recognizing the areas where the menace of corruption is widespread. A summary of comparison among countries and regions are presented in Tables 1 and 2. The response on the question that would you expect to pay bribe to public officials to get things done, suggests that 48% of Indian firms across the industries do it. This number is indeed very high and almost double than the world's average (27%). It is also higher than other emerging economies like Brazil (9%), Russia (27%) and South Africa (15%). It is even much higher than the South Asian's average (35%), as

countries like Pakistan (27%) and Srilanka (16%) seems to be less corrupt than India. Nevertheless, the situation in fastest emerging economic power-China in worse than India, as 72% Chinese firms expect to give bribe for the same purpose. Bangladesh (85%) and many African and gulf countries are also far ahead than India in this account.

If we consider the issue of bribe to secure a government contract, we find India is relatively less corrupt than most of the other countries. In India only 24% firms are expected to give bribe, while the world's average is much higher (30%). The country is also far better than China (27%), Pakistan (30%), South Africa (32%), Russia (46%) and Indonesia (52%).

In terms of getting operating licenses, the country is in the league of most corrupts countries. More than 52% Indian firms across the industries give bribe for licensing, while the world's average is only 16%. Except in Pakistan (58%), Bangladesh (54%) and some African countries, in all countries relatively less number of firms pay bribe for the licensing purpose. The situation is not better on the tax collection front. In India, 52 % of firms are expected to give bribe in meetings with tax officials, which is again very large in the view of the world's average, which is just around 17%. Here except Pakistan (52%) and some African countries, most of the countries are less corrupt than India.

Overall it seems that India is in the rank of above average corrupt nations. However, in terms of industrial licensing and taxation, the country is in league of the most corrupt nations. This indicates that one of the core problems in the country is the regulations related to industrial licensing and taxation. Therefore, apart from other initiatives to curb the corruption, perhaps reforms and further liberalization in licensing and taxation could prove to be an important tool in dealing and overcoming the corruption in the country. For industrial licensing, there is a need to include more areas in automatic clearance regulations. Case-by-case basis and no time bound approval of projects are promoting corruption between politicians, *Babus* and

corporate. In taxation area also servable long waiting reforms initiatives are required to be implemented now. Furthermore, learning from the reservation of railway ticket, it can be suggested that use of better information & communication technology would also be helpful in tackling this most pressing problem of the country.

Table : 1

Corruption in India: A comparison with the World

Country	% of Firms Expected to Pay Bribe to Public Officials (to Get Things Done)	% of Firms Expected to Give Bribe to Get an Operating License	% of Firms Expected to Give Bribe In Meetings With Tax Officials	% of Firms Expected to Give Bribe to Secure a Government Contract
India	**47.49**	**52.45**	**52.32**	**23.79**
East Asia & Pacific	28.1	17.7	19.1	31.5
Eastern Europe & Central Asia	17.4	12.9	12.9	26
Latin America & Caribbean	22.7	10.5	7.5	15
Middle East & North Africa	37	15.5	22.7	40.9
OECD	12.6	N.A.	28.3	15.6
South Asia	34.7	20.7	30.6	40.8
Sub-Saharan Africa	35.2	19.5	18.3	38.3
Brazil	9.66	5.39	16.44	0.65
China	72.57	8.49	38.74	27.04
Pakistan	27.23	12.65	58.79	30
Russian Federation	29.44	22.18	17.44	46.32
South Africa	15.09	0	3.13	32.24
All countries	27.4	16	16.8	30.3

Source: Enterprise Surveys, the World Bank, **http://www.enterprisesurveys.org/**

Table : 2

Bureaucratic Complexity and Policy obstacle in India: A comparison with the World

Country	Senior Management Time Spent in Dealing with Requirements of Government Regulation (%)	Average number of visits or required meetings with tax officials.	If there were visits, Average number of visits or required meetings with tax officials.	% of Firms Identifying Tax Rates as Major Constrain	% of Firms Identifying Tax Administration as Major Constraint
India	**6.66**	**2.64**	**3.34**	**28.8**	**21.34**
All countries	*8.82*	*2.14*	*3.18*	*35.01*	*23.7*

East Asia & Pacific	7.29	2.27	3.3	23.07	15.49
Eastern Europe & Central Asia	10.56	1.62	2.69	40.14	21.13
Latin America & Caribbean	11.95	1.46	2.81	36.72	27.48
Middle East & North Africa	11.32	2.91	4.41	44.99	32.7
OECD	1.22	1.6	1.6	21.49	16.88
South Asia	6.37	2.04	3.48	23.05	17.91
Sub-Saharan Africa	7.62	2.73	3.6	36.84	26.86
Bangladesh	3.22	1.31	2.15	19.78	30.03
Brazil	18.74	1.23	2.28	83.48	75.09
China	18.3	14.4	17.48	36.8	26.67
Indonesia	1.63	0.15	1.42	4.41	4.8
Malaysia	7.8	2.14	2.81	21.38	16.85
Pakistan	1.91	1.51	2.94	40	23.04
South Africa	5.95	0.78	1.76	4.61	1.96
Sri Lanka	3.54	4.85	9.65	19.11	12.47
Thailand	0.43	0.96	1.39	36	34.86

Source: Enterprise Surveys, the World Bank, http://www.enterprisesurveys.org/

3. Hypotheses and Specification

The related literature has provided contrary evidence on the impact of corruption. One strand of literature, contributed both by economist and non-economists, argues that bribe may enhance the efficiency and productivity (see e.g. Leff,1964, Huntingation, 1968 and Leys 1965). It is theoretically as well as empirically shown that in certain condition (especially in those transition economies) the hypotheis of 'grese the wheels' is true. Focusing on efficiency augmenting role of corruption in a theoretical framework, Lui (1985) has demonstrated that the size of bribes by different economic agents reflects their different opportunity cost, with more efficient firms more able or willing to buy lower effective red tape. In this scenario, a license or contract awarded on the basis of bribe size may attain Pareto-optimal allocation. Therefore, this strnad of research suggests that corruption may foster growth and efficiency

and it shouls not be judged only on the basis of morality. On the other side, the hypothesis of 'sand the wheels' links bribe with the institutional failure. Argument of Myrdal (1968) looks convincing that corrupt government officers may delay in decision making that would otherwise not appear, just to get the opportunity to extract a bribe. Extending the argument, Kurer (1993) points out that the officials have an incentive to create other distortions in the economy to preserve their illegal source of income. These arguments are perfectly compatible with the experience of individual bribers who can indeed improve their own situation thanks to a perk. In this scenario, nothing can be gained from bribe payment. Also, it is highly unlikely that bribe payment leads to award of license to the most efficient producer. Thus, even if the analogy between corruption and a competitive auction holds true, the winner is not necessarily the most efficient and productive one; and the highest briber may simply be the one most willing to compromise on the quality of the goods he will produce if he gets a license. Under those circumstances, corruption will simply reduce rather than improve efficiency.

With these contrary views, we attempt to capture the issue by testing the following hypotheses:

H1: Bribe works as tax for firms, so reduces their profitability.

H2: Bribe is a disincentive for efficiency of firms.

H3: Bribe is a disincentive for productivity of firms.

H4: Bribe reduces competitiveness of firms. (export market).

H5: Policy and Bureaucratic hurdles negatively affect firm's performance.

Who must bribe? Next we seek to know which type of firms pays bribe. Specifically, we are interested to investigate what determines payment of bribe to government official by firms. In

other words, why managers pay bribe to the officers. Specifically, we seek to know, is it true that smaller firms are more likely to be asked for bribe. Subsequently, we look for answer to the question, whether the firms which evade taxes pay more bribes. Third, we are interested to know whether firms which pay bribe are less likely to have their accounts certified by external auditors. Fourth, our analysis also seeks to find out if firms which are struggling in the market and generate less profit are likely to pay bribe. Finally, we are also interested to know whether policy obstacle and Bureaucratic Complexity also lead to higher incidence of bribe payment. These questions are captured in the following hypotheses:

H6: Firms that are under-reporting sales will be more likely to receive demands for informal payments or pay more bribes to the government officers

H7: Bureaucratic Complexity leads to bribe payment

H8: External audited enterprises pay fewer bribes

Model specification

To test the hypotheses of 1 to 5, we specify following baseline model for estimation:

$$X = \alpha + \beta_0 bribe + \beta_1 policy\ obstacle + \beta_2 bureaucratic\ complexitysize + \beta_6 contol + e ....1$$

To test the hypotheses of 6 to 8, the following baseline model to be estimated:

$$bribe = \alpha + \beta_0 tax\ comp + \beta_1 policy\ obstacle + \beta_2 bureaucratic\ complexity + \beta_3 external\ audit + \beta_4 size + +\beta_5 profit + \beta_6 contol + e ....2$$

where X is measure of firm's performance, i.e. profit, TE, labor productivity and export performance. *tax comp* is tax compliance, *bribe* is bribe variable, *policy obstacle* is average policy obstacle, *bureaucratic complexity* is average bureaucratic complexity, external audit is dummy variable for external auditing. While size, profit and control are measures of size,

profit and other control variables of the enterprises, respectively. α is constant, βs are parameters to be estimated and ε is stochastic error term. In the analysis of equations 1 and 2, it is most likely that endogeneity of some of the factors that lead firms to evade tax may also lead them to pay bribe. Following Kenyon (2008) we have included some firm-specific control variables, which take of care this problem.

4. Data and Variables

The outcome data used in this paper are from the World Bank Enterprise Surveys carried out worldwide in 2005-2006. A subset of 2287 Indian enterprises across 22 industries and 37 Indian cities were surveyed. An Enterprise Survey is a firm-level survey of a representative sample of an economy's private sector. The surveys cover a broad range of business environment topics including access to finance, corruption, infrastructure, crime, competition, and performance measures. The Enterprise Survey is answered by business owners and top managers. Sometimes the survey respondent calls company accountants and human resource managers into the interview to answer questions in the sales and labor sections of the survey. This study has utilized several striking features of the data. First, not all firms report that they need to pay bribes, and there is considerable variation in reported graft across firms facing similar institutions, regulation and policies. Second, similar features also exist in the tax compliance variable of the surveyed firms. Finally the database also provides important information regarding firm specific characteristics, i.e. age, ownership, employment and competition in the market. Definition of variables and corresponding survey question is presented in Table:3. A summary of variables can be seen in Table 2A of the Appendix.

Table 3: Definition of Variables and Surveyed Question

Name of variables	Definition	survey questions
Tax compliance ($tax\ comp$)	% of output reported for tax compliance	Recognizing the difficulties many enterprises face in fully complying with taxes and regulations, what percentage of total sales would you estimate the

		typical establishment in your sector reports for tax purposes? Q.NO. r11_4_5a
Bribe payment ($bribe$)	Paying bribe to the government officials Bribe payment=1, otherwise 0	We've heard that establishments are sometimes required to make gifts or informal payments to public officials to "get things done" with regard to customs, taxes, licenses, regulations, services etc. Q.NO. r11_4_3a
Employment ($size$)	Total employment (in logarithm)	Ave. number of workers during fiscal year Q.NO. R14_2a3
Profit	Profit	During the last accounting year, what percentage represented your net profits (after tax) over your establishment total annual sales? Q.NO. r13_4a
Policy obstacle	Average score of degree of obstacle (related to Tax administration, Customs and Trade Regulations, Labor Regulations & Business Licensing and Operating Permits)	Please tell us if any of the following issues are a problem for the operation and growth of your business. If an issue poses a problem, please judge its severity as an obstacle on a four-point scale where: 0 = No obstacle 1 = Minor obstacle 2 = Moderate obstacle 3 = Major obstacle 4 = Very **Q.N. r11.5 a**
External Audit	Binary variable taking the value 1 if financial statement checked and certified (audited) by an external auditor, 0 otherwise.	Does your establishment have its annual financial statement checked and certified (audited) by an external auditor? (Codes: 1=Yes 2= No) **Q.N.r 5.8**
Foreign ownership	Foreign firm=1, otherwise 0	What percentage of your firm is owned by
Bureaucratic Complexity	In terms of percentage	In a typical week over the last year, what percentage of total senior management's time (e.g. general manager, chairman, director, vice-president, and/or chief officers for operation, finance, but not supervisors) was spent in dealing with requirements imposed by government regulations [e.g. taxes, customs, labor regulations, licensing and registration, inspections] including dealings with officials, completing forms, etc.? **Q.N r11_4_2**
Character of the market	Characteristics of the market where the firm conducts business	How would you characterize the market where your firm conducts business (Codes: Local =1 Regional=2

		National=3 International=4) Q.N.11.11
Sell to Government	Binary variable taking the value 1 if the firm sells part of its output to the government, 0 otherwise.	Approximately what percentage of your establishment's domestic sales in the last year were to: i. the government ii. state-owned enterprises Q.N.13.13.B
Age	Age of the firm	In what year did your establishment begin operations? Q.N.r1_4
Export	exported directly	What percent of your establishment's sales in the last year (2004):exported directly (%) R13_13a2
Import	Imported directly	Over the last year (2004), what percent of your establishment's purchases of material inputs and supplies were:purchased through direct imports (%), R13_15b
R&D	Total expenditure (in logarithm)	How much did your firm spend on design or R&D in 2004? [Spending includes wages and salaries of R&D personnel, such as scientists and engineers; materials, education costs, and subcontracting costs.] R13_6
Labor productivity	Gross value added/no. of workers	
LTE	For computation of TE, See appendix	

5. Empirical Results

In this section, we present results of the empirical analyses and provide discussion on the findings. Equation 1 is estimated in alternative frameworks and results are reported in Table 4. Quite contrary to the popular belief that bribe payment results in higher profits we note from Table 4 that there is a negative association between the two. Since bribes are actually paid out of the profits the negative sign of the coefficient of bribe payment is understandable in the equation for profit. This result is quite consistent to across the specifications. Specifically, it suggests that bribe payment reduces the profit 3 to 6% of the Indian firms. Therefore, hypothesis H1 seems to be true in our case. Among the other variables the policy obstacle turns out to be significant, suggesting that complexities relating to policy reduces profits. Export or import does not turn out to be significant individually possibly because

their impact is captured by the policy obstacle itself. The same explanation may be cited in the case of bureaucratic complexity. The other interesting observation relates to the age of the firm. The coefficient being negative one may deduce the conclusion that the new firms reap higher profits.

Table 4: Dependent Variable: Profit

	1	2	3	4	5
Bribe payment	-3.358874** (.4673534)	-3.396865** (.476095)	-4.634377** (.5377248)	-4.690257** (.539560)	-6.178858** (.640304)
Employment		-.1403909 (.1820591)	-.2685729 (.2070077)	-.2156361 (.2095324)	-.0270868 (.2729074)
Policy obstacle			.6764925* (.381811)	.7090383* (.3851326)	1.018963** (.450369)
Bureaucratic Complexity				.0076863 (.0227763)	.0062884 (.0264416)
Export					.0031249 (.0105545)
Import					-.0161658 (.0238676)
R&D					-3.70e-06 (9.34e-06)
Foreign ownership					-.01575 (.0468053)
Age					-.0136121* (.030549)
Constant	13.61757** (.3251178)	14.0884** (.6600623)	14.35931** (.9640261)	14.1052** (.9928544)	13.47812** (1.230398)
R^2	0.0265	0.0276	0.0540	0.0548	0.1079
Observations	1899	1860	1383	1377	871

Notes:

1.** and * Significant at 5% and 10% level, respectively.

 2. Standard error in parentheses.

3. estimated using OLS

Technical efficiency is an important index of performance. Therefore, we test the impact of bribery on the efficiency of firms and present results in Table 5. Consistent with the previous results, TE is again seen to be negatively associated with bribe payment. Further, with the introduction of the policy obstacle the coefficient of bribe payment turns out to be

insignificant. We may infer that due to policy complexities the firms are not able to untilise the available resources optimally. One argument could be that bribe payment enhances the accessibility to certain factors which in turn may help firms utilize the inputs efficiently. One example could be accessibility to timely availability of certain inputs. However, it seems this is not the case in India, and in fact bribery is hurting the efficiency level of the firms. The evidence also indicates policy obstacle has dampening effects on the efficiency (see column 3). However, this finding is not consistent across the specification, as inclusion of other control variable in column 4 makes it insignificant. Surprisingly, R&D takes a negative coefficient in the equation for TE possibly because technology is actually imported and does not have much relationship with domestic pursuits for technological up-gradation. In the name of R& D the firms rather try to seek certain favours and if such expenditures are at the cost of quality input it can hamper performance. Also it is evident that the older forms are less efficient. The new firms are more competitive and thus their performance is better than the rest as seen in terms of profits also.

Table : 5   Dependent Variable: TE

	1	2	3	4	5
Bribe payment	-.0001261**	-.0001208**	-.0000799	-.000083	-.0001371*
	(.0000663)	(.0000665)	(.0000714)	(.0000716)	(.0000847)
Employment		-.000019	-3.47e-06	-1.92e-06	5.14e-06
		(.0000261)	(.000028)	(.0000281)	(.0000369)
Policy obstacle			-.0000965**	-.0000892	
			(.0000505)	(.0000509)	
Bureaucratic Complexity				-4.67e-06	-4.24e-06
				(3.21e-06)	(3.45e-06)
Export					4.88e-06**
					(1.51e-06)
Import					-4.33e-06
					(4.44e-06)
R&D					-1.81e-09*
					(1.09e-09)
Foreign ownership					-8.61e-06
					(7.56e-06)
Age					-7.41e-06**
					(3.87e-06)
Constant	1.993597**	1.993655**	1.993654**	1.993697	1.9938**

	(.0000476)	(.0000952)	(.0001301)	(.0001334)	(.0001392)
R^2	0.0025	0.0028	0.0046	0.0065	0.0324
Observations	1427	1426	1106	1102	872

Notes:

1.** and * Significant at 5% and 10% level, respectively.

2. Standard error in parentheses.

3. estimated using OLS

Next we test the effects on the export performance and present results in Table 6. Export performance of the firms is directly affected by bribe payment. Employment, a proxy for the size of the firm, is also a positive determinant of export performance. Since bribe payment and policy obstacle are inter-related the positive sign for the latter is understandable. In addition, in India, for exporting firms are still required to seek several clearances and licensing from the government bodies; therefore positive effects of bribe payment seem to be obvious, as bribe paying firms can obtain licenses and clearance relatively more easily. However, with bureaucratic complexity export performance varies negatively. Again, the older firms reveal poorer performance. Compared to the domestic firms the foreign owned firms are better performers as they have a greater accessibility to the international market.

Table : 6   Dependent Variable: Export performance

	1	2	3	4	5
Bribe payment	4.540317**	3.537435**	3.080487**	3.119403**	4.138722**
	(1.283943)	(1.258229)	(1.604123)	(1.610475)	(1.950053)
Employment		6.250304**	6.827798**	7.032601**	6.243358**
		(.4797842)	(.6131177)	(.6201649)	(.792741)
Policy obstacle			3.005151**	3.3443**	4.118462**
			(1.133116)	(1.14268)	(1.354954)
Bureaucratic Complexity				-.1018966	-.1371252*
				(.0659626)	(.0756367)
Import					.1360742**
					(.0738289)
R&D					.0000118
					(.0000266)
Foreign ownership					.522833 **
					(.1473272)
Age					-.2028603**
					(.0918039)
Constant	9.716002**	-9.798214**	-14.07613**	-13.85172**	-11.60253**

	(.8946336)	(1.73919)	(2.83884)	(2.916579)	(3.696302)
R^2	0.0059	0.0820	0.0840	0.0881	0.1080
Observations	2105	2059	1510	1502	945

Notes:

1.** and * Significant at 5% and 10% level, respectively.

2. Standard error in parentheses.

3. estimated using OLS

Finally, we test the impact on labor productivity of firms and present it in Table 6. In terms of labour productivity, the positive impact of bribe payment is again evident, however, statistically the variable is found to insignificant across the specification. Results of policy obstacles are found to be positive though statistically insignificant. Not very surprising, bureaucratic complexity is found to be positive and statistically significant. This may indicate that tough bureaucracy often protects labor from exploitation, which in turn enhances their confidence and productivity. Our results of Column 5 also indicate that exporting, importing and innovation have positive spillover effects on the performance of labor, which is indeed an important result.

Table : 7 Dependent Variable: Labor productivity

	1	2	3	4	5
Bribe payment	.0695318** (.0347517	.0603621** (.034737)	.0193546 (.037815)	.0044322 (.0371843)	-.0178639 (.0473387)
Employment		.0476784** (.0132842)	.0254697* (.0143862)	.03857** (.0142806)	.0082252 (.0199682)
Policy obstacle			.0216778 (.0267475)	.0226118 (.0264047)	.0648418** (.0331156)
Bureaucratic Complexity				.0044772** (.0015106)	.0044586** (.0017945)
Export					.0031666** (.0007892)
Import					.0014405** (.0018483)
R&D					4.71e-06** (7.29e-07)
Foreign ownership					-.0027422 (.0039281)
Age					.0051911** (.002226)
Constant	2.059294**	1.910098**	2.010074**	1.920135**	1.816651**

	(.0242594)	(.048092)	(.0668622)	(.0674761)	(.0903921)
R^2	0.0021	0.0089	0.0031	0.0131	0.0942
Observations	1892	1892	1383	1377	854

Notes:

1.** and * Significant at 5% and 10% level, respectively.

 2. Standard error in parentheses.

3. estimated using OLS

Our overall findings regarding the effects of bribe payment on firm' performance are found to be rather mixed. Results lend some strong support to hypotheses *H1* and *H2*. Thus, we can conclude that it works as tax on profitability of firms and provides incentives for inefficiency. These results somewhat corroborate the findings of McArthur and Teal (2002) for the African firms. However, the evidence is inconclusive for H3, as we fail to establish any positive impact on productivity. On the other hand, bribing to the government officers has a positive effects on the firm's exporting performance. Therefore, the evidence provides support for both of hypotheses: 'grease the wheels' as well as 'sand the wheels'.

Who pays bribes?

In this section we examine what type of firms pay bribe. To quantify firms, we have specified a range of empirical models and tested them. For this purpose, we regress baseline equation 2 to test hypotheses 6 to 8.   These models are estimated using Probit regressions, as the dependent variable- bribe payment is a dummy variable. Results of the estimation are reported in Table 8. Column 1 of the table report results of the model which includes tax compliance and employment. It is clearly shown in the results that tax compliance has positive effects on probability of bribe payment. Furthermore, employment variable, which is kept as a proxy for size of the firm, is also found to have a crucial and positive role in bribe payment. Column 2 of the table report results of the model which also includes profit variable. Results yield similar results for tax compliance and employment as that of column 1. Profit variable is found to be negative and statistical significant, implies that probability of

profit making firms pay bribe is much lesser and struggling firms in the market are required to make informal payment to the officers. This is indicative of the fact that firms which are better off in terms of profit do not bother to pay bribe. On the other hand the poor performers are rather disparate to enhance their performance by paying bribes. To test the effects of policy obstacles on the bribe payment, we include the policy obstacle variable in the specification and present results in column 3 of the table. As expected, results of the analysis reveal that policy obstacles are important and significantly increase probability of bribe payment. Other striking feature of the results is that the size variable (employment) has become insignificant. The following columns (4 to 9) include several important variables, i.e. external audit, sell to government, bureaucratic complexity and character of the market.

In general, it is found that external audit and bureaucratic complexity are not important factors, which affect probability of bribe payment. The policy or bureaucratic complexity, whenever it is significant, shows a positive effect on bribe payment. But selling to government and type of market in which firms operate are found to be impacting the bribe payment. It make sense that firms which sell to government is interact more with the officers therefore leading a higher probability of bribe incidents. Firms which sell their products to government pay more bribes as they may have to receive approvals for passing the quality test, for acceptance of tenders and to get larger demand consignments. However it is somewhat surprising that firms which operate in the international market or in the relatively competitive domestic market are likely to be asked for more bribes. Some other control variables, i.e. labor intensity, foreign ownership and age factors are also included to control the models. However, their impact on the bribe could not be established clearly. Findings also suggest that industry-specific effects are not very important as inclusion of industry dummies fail to have any noteworthy impact on the results of any variables (see columns 6 & 9 of Table 8). Overall, these results reveal three important characteristics of the bribe paying

firms. First, tax evading firms are likely to pay more bribes to the government officers. This finding corroborates the finding of Kenyon (2008) for the Brazilian firms. Second, profitable firms are better in tax compliance. A possible explanation of this finding could be the loss making firms need more support from the government agencies, therefore, they are required to pay more bribe to the officers. Third, policy impediments are important source of bribe payment.

Table 8: Determinants of Bribe payment

Variables	1	2	3	4	5	6	7	8	9
Tax compliance	-0.006** (0.0011)	-0.00807** (0.00118)	-0.008597** (0.0015133)	-0.00871** (0.0015174)	-0.0080876** (0.0321538)	-0.0083043** (0.0016541)	-0.0084557** (0.0016436)	-0.0080181** (0.0017561)	-0.0079447** (0.0018069)
Employment	0.0617309** (0.020988)	0.0695226** (0.023042)	0.0332541 (0.0270945)	0.0255933 (0.027697)	-0.0097725 (0.0321538)	-0.0120894 (0.0335137)	-0.0088784 (0.0314483)	-0.0462586 (0.0364366)	-0.0508243 (0.0385059)
Profit		-0.0214** (0.003004)	-0.0296973** (0.003508)	-0.029743** (0.0035104)	-0.033685** (0.001613)	-0.0348797** (0.004036)	-0.0316705** (0.0038516)	-0.0367462** (0.0043405)	-0.0379147** (0.004495)
Policy obstacle			0.145421** (0.050183)	0.141976** (0.0502608)	0.0645994 (0.0550272)	0.0708487 (0.055713)	0.1145757** (0.0561669)	0.0398296 (0.0615607)	0.0529677 (0.0625509)
External Audit			--	0.165464 (0.1238014)	--	--	0.1350609 (0.1289716)	-0.0341272 (0.1407598)	0.0535428 (0.1481756)
Sell to govt.			--	--	--	--	0.3384704** (0.095677)	.04118707** (0.1064203)	0.462465** (0.10968)
Labor intensity			--		--	--	-0.5557243* (0.29854)	0.3642597 (0.3281705)	-0.3520536 (0.3352667)
Foreign ownership			--	--	0.0034855 (0.0041748)	0.0046332 (0.0034638)	--	-0.0084959 (0.0052088)	-0.0073999 (0.0053518)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bureaucratic Complexity			--	--	0.0045968 (0.0034017)	0.0056388 (0.00352)	--	0.0052107 (0.0037286)	0.0067395* (0.0038513)
Character of the market			--	--	0.1869538** (0.0409351)	0.2274426** (0.0455702)	--	0.2495335** (0.0484148)	0.2732981** (0.0511406)
Age			--	--	0.003829 (0.0033695)	0.0039714 (0.0034638)	--	0.0036674 (0.0037209)	0.0042331 (0.0038091)
Constant	0.3424723** (0.1188677)	0.6792579** (0.1140355)	0.8412894** (0.1767543)	0.7312421 (0.1950067)	0.4509205** (0.2037047)	0.4689568** (0.2255805)	0.9232305** (0.2122849)	0.5077452** (0.2393175)	0.4176687 (0.2682641)
LR χ^2 (P-value)	47.10 (0.00)	42.20 (0.000)	113.42 (0.000)	115.21 (0.000)	138.53 (0.000)	165.52 (0.000)	122.34 (0.000)	155.10 (0.000)	183.39 (0.000)
Industry Dummy	No	No	No	No	No	Yes	No	No	Yes
Observation	2056	1837	1343	1343	1187	1186	1135	1011	1010

Notes:** and * Significant at 5% and 10% level, respectively. 2. Standard error in parentheses.

6. Conclusion

Some recent incidences of corruption and tax evasion in India have attracted much attention and initiated debate on these issues in India. The standard literature, surveys and perception indexes also indicate that corruption is widespread in India, which is believed to be seriously hampering the growth prospects of the country. Motivated by these developments, this study has twin objectives. First, to examine the impact of bribe payment on firm performance, we consider four important indicators of firm performance, namely, profit, technical efficiency, labor productivity and export performance. Specifically, we emprically investiagte two important but alternative hypoheses, namely 'grease the wheels' and 'sand the wheels'. Second, we intend to quantify firms which must pay bribe. For the analysis, we utilize the enterprises survey data of the World Bank. The survey was conducted on Indian manufacturing in collaboration with a prominent local industry body in 2005-2006. It covered

2287 enterprises of twenty important manufacturing industries spread across seventeen Indian states. This study has utilized several striking features of the data. First, not all firms report that they need to pay bribes, and there is considerable variation in reported graft across firms facing similar institutions, regulation and policies. Second, similar features also are exists in the tax compliance variable of the surved firms. Final, the survey data also provide a large number of firm-specific characteristics, which are useful to conduct analysis at firm-level.

On the whole the paper tries to assess the impact of bribe payment on performance indices after controlling for certain variables and also examines the impact of performance level and complexities in the system on bribe payment. Our overall findings regarding the effects bribe on firm' performance are found to be rather mixed. We find that bribe works as tax on profitability of firms and provides incentives for inefficiency. These results somewhat corroborate the findings of McArthur and Teal (2002) for the African firms. However, the evidence is inconclusive for productivity, as we fail to establish any direct impact of bribe on productivity. On the other hand, bribing to the government officers are seemed to have positive effects on the firm's exporting performance. Therefore, the evidence provides support for both of hypotheses: 'grease the wheels' as well as 'sand the wheels'.

Findings regarding which conditions instigate firms to pay bribes reveal three important characteristics of the bribe paying firms. First, tax evading firms are likely to pay more bribes to the government officers. This finding corroborates finding of Kenyon (2008) for the Brazilian firms. Second, profitable firms are better in tax compliance. A possible explanation of this finding could be as loss making firms need more support from the government agencies, therefore, required to pay more bribe to the officers. Third, policy impediments are important source of incidents of bribe payment. Thus we can argue that it is the complexity in the system (policy or bureaucratic) which tends to raise the probability of paying bribes and also dampen the performance. Therefore, the policy conclusions are two

fold: first of all the constraints which prompt firms to pay bribes need to be removed and secondly the problems of the poor performers need to be identified specifically so that initiatives can be taken to help them overcome. This will restrain the poor performers from paying bribes.

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Appendix

To measure the Technical Efficiency (TE) of the firms, we utilize the Maximum Likelihood (ML) estimates of stochastic frontier production functions, developed by Battese and Coelli (1992) for panel data. In this model, industry effects are assumed to be distributed as a truncated normal variable, which allows it to vary systemically with time. Specifically, we employ time-varying efficiency model of the stochastic frontier as developed by Battese and Coelli (1992). The model may be specified as:

$$Q_{it} = \alpha X_{it} + (V_{it} - \mu_{it}) \dots\dots\dots\dots\dots\dots \quad (4)$$

where Q_{it} and X_{it} are output and inputs in log-form of i-th industry at time t. Disturbance term is composed of independent elements, V_{it} and μ_{it}. The former is assumed to be independently and identically distributed as $N(0, \sigma^2{}_v)$. The element μ_{it} is a nonnegative random variable, associated with technical inefficiency in production, assumed to be independent and identically distributed with truncation (at zero) of the distribution $N(\mu_{it}, \sigma^2{}_\mu)$. The parameters α s can be obtained by estimating the stochastic production function (4) using a ML technique.

Coelli (1996) utilizes the parameterization of Battese and Corra (1977) to replace $\sigma^2{}_v$ and $\sigma^2{}_\mu$ with $\sigma^2 = \sigma^2{}_v + \sigma^2{}_\mu$ and $\gamma = \dfrac{\sigma^2{}_\mu}{\sigma^2{}_v + \sigma^2{}_\mu}$ in the context of ML estimation. The term γ lies between 0 and 1 and this range provides a good initial value for use in an iterative maximization process. Subsequently, the relative Technical Efficiencies of each industry can be predicated from the production frontier as follows:

$$TE = \frac{Q_{it}}{\exp(f(X_{it}; \alpha))} = \exp(-\mu_{it}) \dots\dots\dots\dots (5)$$

Since μ_{it} is, by definition, a nonnegative random variable, *TE* is bounded between zero and unity, where unity indicates that the industry is technically most efficient. Our model measuring the efficiency is:

$$\ln Q_{i,t} = \alpha_0 + \alpha_1 LnK_{i,t} + \alpha_2 LnN_{i,t} + \sum_t \lambda_t D_t + (v_{it} - u_{it}) \dots\dots\dots\dots (6)$$

Here D_t is a dummy variable having a value of one for t^{th} time period and zero otherwise and λ_t s are parameters to be estimated. The dummy variable is introduced in the model for the technical change; this is in line with the general index approach of Baltagi and Griffin (1988). The change in λ_t between successive periods becomes a measure of rate of technical change.

$$TC_{t,t+1} = \lambda_{t+1} - \lambda_t \ \dots\dots \qquad \dots\dots\dots\dots (7)$$

This implies that the hypothesis of no technical change is: $\lambda_t = k \ \forall t$. Using the above model, we estimate the TE of the industries. Our dataset for the panel of industries is same as that used earlier for TFP estimation.

Finally, as discussed above, a Cobb-Douglas production is postulated for the purpose of TE estimation. The results are presented in column 4 of Table 2A. The estimated coefficients of capital and labour are found to be positive and statistically significant at the conventional level. On the basis of these results, TE of the industries is estimated for further analysis.

Table 1A. Cobb- Douglas Production Function Estimation,

(Dependent Variable: ln(GVA))

Variables	Coefficients

Capital	.443582** (.0245267)
Employment	.443582** (.0173908)
Constant	.9259105** (.1194529)
Log likelihood	-2701.0344
Estimator	Time-invariant inefficiency model

Notes: Standard errors are in parentheses.

Table 2A. Summary Statistics

S. No.						
	Age	16.79875	11.51212	0	90.00	2077
1	Bribe Payment	0.4820647	0.4997875	0	1.00	2286
2	Bureaucratic Complexity	12.62891	13.6687	0	100.00	2268
3	Character of the Market	2.414273	1.081465	1	4.00	2228
4	Employment	3.232827	1.329597	0	8.52	2135
5	Export	11.92037	29.52185	0	100	2105
6	External Audit	0.839895	0.3667836	0	1.00	2286
7	Foreign Ownership	0.9364742	8.186095	0	100.00	2263
8	Import	2.404476	11.82752	0	100	2098
9	Labor Intensity	0.14815	0.1482386	0	1.00	2106
10	Labor productivity	2.093178	.756155	-1.54	-1.54843	1892
11	LTE	1.993532	1.993532	1.983	1.998352	1427
12	Policy Obstacle	1.493019	0.7105379	0	2.77	1656
13	Profit	11.99208	10.31271	0	100.00	1899
14	Sell to Govt.	0.2066806	0.40503	0	1.00	1916
16	Tax Compliance	84.39325	25.55686	0	100.00	2200
17	Variables	Mean	Std. Dev.	Min.	Max.	Obs.