Research Article

Ummad Mazhar* and Komal Iftikhar

Corruption Accusations and Bureaucratic Performance: Evidence from Pakistan

https://doi.org/10.1515/econ-2021-0005
received January 28, 2021; accepted August 20, 2021

Abstract: This study assesses the effectiveness of anti-corruption policies of Pakistan by relating the corruption of government officials to the actual and perceived bureaucratic hurdles faced by formal businesses. It offers a unique perspective by focusing on cases in which the accused officers voluntarily disclosed the misuse of public money (or gains acquired through corruption) in order to avail the option of plea-bargaining. The empirical analysis estimates the effect of these policies on the responses of the managers of business firms in Enterprise Surveys. The number of accusations seems to reduce the incidence of bureaucratic corruption. While the amount that is being offered in bargaining has a negative effect overall, it switches sign overtime suggesting the possibility that it may increase corruption in the long run. The core results are robust across various measures of firm-level corruption. The instrumental variable estimates produce similar results.

Keywords: corruption, plea bargain, voluntary disclosure, Pakistan, Government-business relation

1 Introduction

A potent cause behind the misallocation of resources in developing countries is the misuse of authority and public funds by government officials. Particularly, at the micro-economic level, bureaucratic holdups and delays are not only ethically inappropriate but also cause a significant drag on private businesses. Unsurprisingly, the efforts to conquer corruption are not confined to regulatory reforms and incentive mechanisms but also include harsh punishments like even the death penalty.[1] Ultimately, a society's tolerance for corruption, and the choice and effectiveness of anti-corruption measures are context specific and require careful analysis (Graaf, 2007).

The fight against corruption is usually operationalized through independent anti-corruption agencies. However, it is difficult to separate the good from bad intentions in these campaigns as those in public offices have every incentive to belittle the political statures and reputations of their rivals through fabricated cases.

In recent decades, aggressive anti-corruption campaigns have been a feature of many developing countries. Thus, a number of high-profile politicians and ex-public officials were convicted in South Korea.[2] In China, there was a drive to purge the ruling Communist Party of corrupt officials. Corruption has been cited as one of the main factors in the decline and fall of the Indian National Congress, the political party that ruled India for most of its post-independence history.[3]

In Pakistan too the issue has been a source of political uncertainty since 1990s when elected governments were dismissed in quick succession on grounds of corruption. In 1997, the Bureau of Accountability (called *Ehtisab Bureau* at that time) was established to formally investigate political corruption. In 2002, through various legal amendments, *Ehtisab Bureau* was replaced by the National Accountability Bureau (NAB). In the 11th Five-Year Plan (2013–2018) formulated by the Pakistan Planning Commission, corruption free governance is set as a national goal.

* **Corresponding author: Ummad Mazhar,** Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore 54792, Pakistan, e-mail: ummad.mazhar@lums.edu.pk
Komal Iftikhar: Suleman Dawood School of Business, Lahore University of Management Sciences, Lahore 54792, Pakistan, e-mail: ki.komaliftikhar@gmail.com

1 For instance, Goel and Mazhar (2019) have identified 13 countries with death penalty for white collar crimes like corruption, theft, and fraud. A recent report by the Transparency International shows that a significant proportion of the countries, even those who have been very harsh against political corruption, are sliding down the corruption rankings or showing no improvement. https://www.transparency.org/news/feature/cpi_2019_global_highlights

2 https://www.washingtonpost.com/world/asia_pacific/another-former-south-korea-president-jailed-for-corruption/2018/10/05/7e216cc6-c866-11e8-9158-09630a6d8725_story.html

3 https://thediplomat.com/2017/04/how-the-indian-national-congress-lost-india/

The efforts of NAB against corruption are highly debated in Pakistan and have caused political polarization. During the period of this study (i.e. 2002–2013), NAB maintained a conviction rate of 51% and has decided 1,762 cases. Perhaps the most controversial aspect in the NAB's fight against corruption is the use of procedures like plea-bargaining and voluntary disclosure. These are accepted legal procedures in many other countries like Canada, the UK, the USA, and India.[4] At least theoretically, these procedures cannot be dismissed as ineffective in the context of a developing country where judicial processes are painfully slow and replete with all types of inertia that favor the culprit. However, in the case of NAB the main criticism is that its policy allows easy escape to those involved in corruption by surrendering a proportion of the embezzled funds (currently 80%). Thus, without empirical analysis, the net benefits of the policy are unclear.

Using the case of Pakistan, this study gathers unique data about all the corruption cases involving government servants (GS) where the accused volunteered to return embezzled funds and was granted the option of plea bargaining by the court. With below potential rate of economic growth, and a slow but consistent adoption of democratic norms, the emerging political parties of Pakistan are sensitive to the administrative weaknesses and bureaucratic excesses of past regimes and have vowed to strengthen accountability mechanisms.

The empirical enquiry in this study focuses on the corruption cases involving GS and bureaucrats from all the four provinces of Pakistan. This data set is merged with the World Bank Enterprise Surveys (ES) data to see the effect of the number of plea-bargained cases and the amount used in the plea bargaining on the relevant responses of business managers. The responses of business managers to corruption-specific questions in the ES data set are interpreted here as a proxy for business–government relations. The study, therefore, helps us to understand the efficacy of the measures to curb corruption and how they affect the perceptions of firm managers.

The study fills out the following important gaps in the existing literature on anti-corruption policies in developing countries:

- It contributes by assessing the efficacy of anti-corruption policies by using both the perceptions and experiences of firm managers as indicators of business–government relations. This adds to the existing studies that rely mostly on the public perception-based measures of corruption (e.g., Donchev & Ujhelyi, 2014).
- Using information about actual corruption cases involving GS, it provides evidence that a tradeoff exists between recovering looted funds and the long-term objective of eliminating corruption. Thus, the strategies or incentives that promise easy and quick recovery of looted funds may increase corruption in the long term.

Using multiple questions related to bribery incidents in the ES data set, we discovered a negative correlation between the number of plea-bargained cases and the perception and experience of bureaucratic corruption of business firms. Interestingly, the effect of the size of the *bargained amount* is insignificant in baseline analysis. This finding is interpreted here as the relative importance of the punishment effect (of conviction) vis-á-vis the disincentive caused by surrendering of the gains. However, incorporating the possibility of time dependence of the effect, we find that the coefficient of the bargained-amount switches sign thus supporting the view that the availability of the plea-bargaining option may actually encourage, rather than discourage, corruption over time. This is in line with the existing finding that the policy of plea bargaining is bound to be abused (Aniche, Alumona, & Obiwulu, 2020).

Section 2 reviews the relevant literature. In Sections 3 and 4, we present data and empirical results. Section 5 concludes and notes the limitations of the research.

2 Related Literature

The economic approach to crime relies on the framework first formalized by Becker (1968). In this framework, rational agents prefer illegal exchanges if the expected net benefits from such transactions are positive. This elegant cost–benefit framework is extended to understand the underlying logic of white-collar crimes (Draca & Machin, 2015; Rose-Ackerman, 2010). Accordingly, a firm is more inclined to pay bribes if there are net benefits in avoiding complex and strict procedures, the unscrupulous court system and incompetent government service (Huang & Rice, 2012; Jiang & Nie, 2014; Wu, 2009). Thus, bribing and lobbying is an important way to avoid regulatory delays and competitive pressures (Oh, 2009; Tonoyan, Strohmeyer, Habib, & Perlitz, 2010; Zhou & Peng, 2012). In developing countries, formal sector firms view corrupt practices as "the ways things are done" (Brass, Butterfield, & Skaggs, 1998; Hallward-Driemeier & Pritchett, 2015).

4 Interestingly, these countries enjoy better corruption perceptions than Pakistan on Transparency International rankings.

The link between corruption and firm performance is influenced by the strategic activities managed by a firm in response to corruption (Galang, 2012). In the presence of regulations replete with bureaucratic hold ups, corruption may help businesses by greasing up the process of starting a new business (Dreher & Gassebner, 2013; Jiang & Nie, 2014; Wang & You, 2012)and by reducing delays in public service availability (Van Vu, Tran, Van Nguyen, & Lim, 2018; Zhou, Han, & Wang, 2013). Bribes, by winning political favors, can also serve as an instrument to increase company value (Faccio, 2006). In contrast, corruption has a negative impact on firm growth if it hurts competitiveness (Fisman & Svensson, 2007; Gaviria, 2002).

The negative effects of corruption on a firm's productivity are more prevalent in those countries where the legal framework is weak (De Rosa, Gooroochurn, & Görg, 2015). In contrast, Bai, Jayachandran, Malesky, and Olken (2017) have estimated a reverse effect, i.e., corruption reducing the effect of growth especially for firms who can easily relocate.

The characteristics of firms also play a role in determining their preference for informal payments. For instance, bigger firms are more likely to pay bribes to get government contracts and preferential tax benefits (Delavallade, 2012; Mishina, Dykes, Block, & Pollock, 2010; Rand & Tarp, 2012). However, the cost of corruption is higher for small firms if it taxes a large proportion of their resources (Zhou & Peng, 2012). Paunov (2016) argues that small firms are negatively affected by corruption if they are adhering to international quality standards. Dutta and Sobel (2016) suggest that bribery is not a "cost of doing business," rather corruption impairs entrepreneurship.

If corruption is a way to avoid complex administrative procedures, then voluntary disclosure and plea bargaining can also be interpreted as possible means to avoid complex and time-consuming legal procedures (Feeley, 1982). However, it is important to see how the legal option of plea-bargaining changes the usual calculus of crime by eliminating the possibility of punishment (or at least harsh punishment). For instance, Reingnaum (1993) argues that plea bargaining reduces the defender's expected cost and induces crime. Thus, plea bargaining dilutes the deterrence effect (Miceli, 1996).

There are studies supporting the deterrence effect associated with apprehension and detection risk (e.g., Barnum, Nagin, & Pogarsky, 2020; Becker & Stigler, 1974; Rose-Ackerman, 1978). On the other side, there exist evidence that a high risk of detection has a deterrence effect but kills the intrinsic motivation for honesty (Schulze & Frank, 2003). The net effect on overall corruption is undetermined.

Another factor is the impact of public perception on corruption control, as it shows how much people are willing to support anti-corruption policies (Li, Gong, & Xiao, 2015). Thus, any state seeking a positive outcome of an anti-corruption instrument should gain public support for strongly backing it up with policy enforcement.

By contrast, corruption in law enforcement limits the deterrence effect (Polinsky & Shavell, 2001). In a weak institutional environment, public officials misuse their power and distort institutions by reducing detection and punishment to facilitate their own embezzlements (Boly & Gillanders, 2018).

This strategy (of voluntary disclosure and plea bargaining) is known for its mixed implications (Aniche et al., 2020). Theoretically, it increases welfare by motivating the truly guilty to self-select themselves and contributes to the accuracy of the legal procedure (Grossman & Katz, 1983). On the negative side, it may help institutionalize corruption and in Pakistan it is heavily criticized on this aspect. Thus, it is necessary to see whether this strategy offers any benefits to society other than having a cost-effective route to recovering embezzled funds.

Framing the discussion in the context of Pakistan we find only limited scholarship on the causes and cures for corruption in Pakistan. For instance, Farooq, Shahbaz, Arouri, and Teulon (2013) argue that corruption hinders economic growth in the case of Pakistan. In contrast, the policies and strategies adopted by the NAB, the country's foremost anti-corruption agency, are not welcomed and debated extensively. For many, the drive against corruption is ineffective and good only for political ends (Ali, 2018). However, in the absence of scientific evidence such accusations are mere perceptions. Given the huge amount of resources at stake, it is necessary to check the extent to which the nabbing of corrupt officials temper economic outcomes.

Considering the above discussion, this inquiry intends to add two novel angles to the existing literature: (i) the study focuses on the variation in the responses of business managers to questions related to bureaucratic corruption. In particular, it estimates the effect of the number of past plea-bargained cases on the responses of business managers. It thus provides a broader assessment of the efficacy of the anti-corruption campaign; (ii) it also estimates the effect of funds recovered through plea bargaining on the outcome. Thus, by comparing the effect of recovered funds over time, it checks for the long-term consequences of the policies aimed at easy-recovery of looted public funds.

Benefiting from the above discussion we can formulate the following two hypotheses:

Table 1: Variable definitions and sources

Variables	Definitions	Source
No. of Accused GS	The relative number of accused government servants that voluntarily disclosed and plea bargained. Average of the last 5 years	[1]
Plea Bargain Amount	The plea bargained amount deposited in the government exchequer	[1]
Bribe1	Firm expects to give bribe to public officials to get things done (1 = yes, 0 = no)	[2]
RegTime	Percentage of senior management time (per week) spent in dealing with requirements of government officials	[2]
Bribe2	In reference to application to public services if a formal gift or payment is requested (1 = yes, 0 = no)	[2]
Bribe3	A dichotomous variable assumes a value of 1 if firm expects to give bribe to secure government contract	[2]
Firm Age	Firm age in years	[2]
SME	Enterprise is either small or medium size (1 = yes, 0 = no)	[2]
HDI	Human development index of the province	[3]
Exporter	Enterprise earns at least 10% of its annual sales from direct exports (1 = yes, 0 = no)	[2]
ManExp	Years of top manager's experience working in the firm's sector	[2]
ISOCertificate	Firm is having international quality certificate (1 = yes, 0 = no)	[2]
PopVote	An index of the winning party's share of votes in elections since 2001	[4]

Notes: [1] National Accountability Bureau operations data. http://nab.gov.pk/nab_ops.asp (accessed 23 August 2019).
[2] World Bank Enterprise Surveys. https://www.enterprisesurveys.org/.
[3] United Nations national human development report 2017: Pakistan. Available at http://hdr.undp.org/en/content/national-human-development-report-2017-pakistan (accessed 23 August 2019).
[4] Chaudhry and Mazhar (2019) index of political competition in Pakistan.

H1 Nab effect hypothesis: A higher number of plea-bargaining cases in the past reduce the government official's incentive to indulge in corrupt transactions, *ceteris paribus*.
H2 Bargain effect hypothesis: (H2.1) The possibility that one can bargain one's way out of corruption related charges by surrendering a part of the illicit gains may encourage corruption; (H2.2) the probability that one may have to surrender misappropriated funds in case of conviction may reduce the net expected gains from such transactions and thus reduce corruption.

3 Data

This study relies on two sources of information. The number of corruption cases involving government officials in each province of Pakistan is extracted from the NAB's annual reports. The second source is the World Bank Enterprise Surveys (ES) which provides information on business firms operating in the formal sector of Pakistan in its four provinces. The following paragraphs explain these data sets in detail (Tables 1–2).

3.1 NAB Data Set

This data set comprises corruption cases involving GS where, under some agreed conditions, the accused has voluntarily returned a percentage of the embezzled funds to the government. The information is gathered from the annual reports and documents available on the website of the NAB (http://nab.gov.pk/). (Table 3 at the end provides the distribution of cases involving government bureaucrats over the years in Pakistan.)

A corruption case, in the context of this study, is defined as an instance of wrongdoing in which a government official is convicted for misappropriation of government resources for personal gains and the case is settled through the procedure of plea bargaining or voluntary

Table 2: Summary statistics (baseline complete case sample)

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Bribe1	1,585	0.47	0.49	0	1
RegTime	1,459	2.69	4.61	0	30
Bribe2	821	0.52	0.49	0	1
Bribe3	460	0.35	0.47	0	1
No. of Accused GS	1,585	9.77	5.12	3	27
Plea Bargain Amount	1,585	15.87	1.48	13.12	18.50
Firm Age	1,585	22.68	13.54	2	127
SME	1,585	0.81	0.39	0	1
HDI	1,585	0.62	0.09	0.35	0.71
Exporter	1,585	0.13	0.34	0	1
ManExp	1,557	18.87	10.29	0	60
ISOCertificate	1,550	0.24	0.43	0	1
PopVote	1,585	0.75	0.043	0.66	0.86

Table 3: National Accountability Bureau annual number of cases

	Total cases	No. of accused GS (with plea-bargaining)
2002	159	23
2003	109	29
2004	111	23
2005	127	20
2006	156	15
2007	322	33
2008	176	17
2009	99	5
2010	131	8
2011	77	13
2012	103	15

Notes: Total number of cases are those that are formally initiated and are decided through the court of justice. The information is available at http://nab.gov.pk/nab_ops.asp (accessed 4 January 2020).

disclosure. The process of plea bargaining allows the convict to deposit an agreed upon amount in the government exchequer to avoid a jail term. The cases with pending status or with doubtful convictions (e.g., those involving political leaders) are not considered. Similarly, the cases where the individual availed the option of plea bargaining before the start of the enquiry are also ignored.

The information is collected separately for all provinces for the period 2002–2013. Thus, in our data set, the province of Punjab has the largest number, i.e., 118, of plea-bargained cases. It means an average of 13 plea-bargained cases per year. In terms of bargained amount, the largest amount offered by a convicted GS is PKR 853,000,000 in sector EOBI (the pension, old age benefits, and social insurance institution of the Government of Pakistan) of the province of Sindh in the year 2003.

Importantly, the total value of the funds voluntarily surrendered or plea bargained is worth a total of PKR 2,270,717,484 over our sample period. If we scale this amount by the annual per capita income of an average Pakistani in the year 2013 (which was $1386 or PKR 145,530), the amount equals the annual income of around 15,600 Pakistanis! It highlights the importance of the problem.

3.2 ES Data Set

The ES data set is an authentic source of information on various actual constraints that formal sector business firms face. The ES data set covers 146,000 firms in 143 countries. The surveys are conducted using similar questionnaire and instruments which make the analysis of this study comparable and replicable in different contexts. The manager responses cover a broad array of questions relating to a firm's operations including financial issues, dealings with government regulators, quality of infrastructure, workforce characteristics, and performance. The analysis in this study uses ES data set from the survey waves of 2007 and 2013 in Pakistan. Given our focus, we exploit the variation in the responses of the managers of business firms to questions asking them about government regulators and other aspects of corrupt dealings. The questions used in the empirical analysis are given in Appendix II at the end of the study.

3.3 Empirical Model

The empirical model relies on Becker's (1968) model of crime as extending by Rose-Ackerman (1978). In the context of this study, the theoretical model predicts that a self-interested government officer demands bribe adjusting the returns with the probability of being sentenced. The recent history of corruption accusations and convictions involving government officials will serve as the subjective probability of being accused and raises the risk of demanding a bribe. This *deterrent effect* would reduce incidents of corruption, *ceteris paribus*.

In contrast, the option of plea bargaining may have a positive or negative effect on corrupt transactions. If it reduces the net return from misappropriation, then it can have a depressing effect. But the possibility of avoiding prison by surrendering a part of the illegal gains, if convicted, may reduce or completely overpower its deterrent effect. Ultimately the consequence of such a provision is an empirical question.

To determine the impact of arresting corrupt officials due to incidents of corruption, we developed a pooled least squares model with time and spatial fixed effects. We follow the recommendation of Wooldridge (2010) in estimating the model with sector, time, and province effects and employ standard errors that are robust against the effects of clustering due to the stratified random sample in the ES data:

$$\begin{aligned}\text{Corruption}_{iktj} &= f(\text{No. of Accused GS}_{kt}; \text{Plea Bargain Amount}_{kt} \\ &\quad ; \text{Controls}; \epsilon_{ikt}) \\ i &= 1, 2, 3, \ldots, 1585\end{aligned} \tag{1}$$

$k = 1, 2, \ldots, 4$

$t = 2007, 2013$

$j = Bribe1, RegTime, Bribe2, Bribe3$

Baseline Controls = (*Firm Age; SME; HDI; Sector Effects; Year Effects; Province Effects*)

Additional Controls = (*ManExp; Exporter; ISOCertificate*), where *Corruption* is the indicator of corruption. In the baseline analysis, it is the perception of business firm managers of the likelihood of encountering a corrupt official. In addition to this perception-based measure, we have also used alternative indicators. Two of these indicators (*RegTime* and *Bribe3*) are experience based and the other (*Bribe2*) is perception based. Thus, our results contribute to the literature dealing with perceptions as well as the experience of corruption as both aspects offer distinct insights.[5]

The *No. of Accused GS* denotes the average number of corrupt GS being accused and plea-bargained in the last 4 years in the given province. In estimations, the value of the *No. of Accused GS* for each province-year is relative to the total number of accusations by the NAB.

The location is denoted by k, and t denotes time. The baseline model assumes that the arrest of corrupt officials has a linear effect on corruption. We relax this assumption by conditioning our analysis separately on the survey year. Moreover, the baseline model also includes the average bargained amount (*Plea Bargain Amount*) to estimate its effect separately, as is required by Hypothesis 2.

Among the control variables we include various firm-level determinants that can make it more or less attractive to bribe-seeking bureaucrats like its age, size, exporting status, and its sector and location. Additional controls are added to take account of the managerial capital (*ManExp*) and firm productivity (*ISOCertificate*); the effect of the level of economic development is captured through the human development index (HDI) of the province

4 Results

Table 4 reports the baseline estimates and extensions that include additional controls. All the models employ standard errors that are robust against the clustering effects at the level of a province. The dependent variable is dichotomous which explains the use of the logit estimator. The diagnostics reported toward the end of Table 4 suggests that each of the models is highly significant overall.

In terms of the primary relationship of interest, our results suggest a strong and significant effect the number of (past) plea bargained cases has on the likelihood of corruption.[6] The coefficient of interest (i.e., *No. of Accused GS*) is negative and statistically significant. More importantly, the estimated effect in the baseline regression (Column 1) amounts to an 80% reduction in the odds of a corrupt encounter with each 1 standard deviation (SD) increase in the number of accusations. Importantly, the coefficient of *Plea Bargain Amount* is negative but insignificant in all cases.

Among the controls we find a significant negative effect of SME on corruption likelihood. The same holds true for HDI which is a proxy for the level of development of a province. Our results also suggest a positive effect of the firm's age on corruption likelihood although the coefficient has no statistical support. Among the sector effects we find a significantly greater likelihood of corruption across industries broadly categorized as leather products, machinery and electronics, motor vehicles, and non-metallic minerals. These sectors are prone to corrupt encounters compared to the benchmark "textiles-garments" sector.

Among the additional controls, we can see the insignificant effect of the top manager's sector specific experience with corruption likelihood. The likelihood of corruption is significantly higher if a firm is earning at least more than 10% of its sales from exports (*Exporter*) or is having an international quality certification (*ISO Certificate*). It may suggest the greater interaction of exporting firms and those having superior quality products that make them easy targets of corrupt government officials.

The location and time effects are also significant. In the case of the former, the probability of corruption is higher in relatively developed provinces like Punjab, Sindh, and KPK compared to the base category represented by Baluchistan (the least developed province in Pakistan). While in the case of time effects, the binary variable representing 2013 suggests that the likelihood of corruption has decreased relative to the earlier time period.

5 Corruption perceptions are potential entry barriers for firms (Davis & Ruhe, 2003), whereas corruption experience increases the transaction costs (see Belousova, Goel, & Korhonen, 2016; Olken, 2009).

6 For the purposes of interpretation, we use percentage change in the odds ratio estimated using "listcoef" routine in STATA 16 version.

Table 4: Number of corruption accusations and firm-level corruption incidence

Dep. Variable: Bribe1 (Firm is expected to pay bribe to government officials)				
	(1)	(2)	(3)	(4)
No. of Accused GS	−0.64***	−0.60**	−0.62***	−0.61**
	(0.249)	(0.235)	(0.241)	(0.271)
Plea Bargain Amount	−0.18	−0.15	−0.19	−0.18
	(0.129)	(0.121)	(0.125)	(0.139)
Firm Age	0.01	−0.01	0.01	−0.03
	(0.133)	(0.120)	(0.128)	(0.115)
SME	−0.37***	−0.37***	−0.22**	−0.07
	(0.115)	(0.127)	(0.100)	(0.222)
HDI	−26.05***	−24.89***	−26.33***	−24.70***
	(7.324)	(6.900)	(7.179)	(8.063)
ManExp		0.01		
		(0.009)		
Year = 2013	−2.92**	−2.69**	−2.83**	−2.92*
	(1.388)	(1.295)	(1.340)	(1.504)
Exporter			0.65***	
			(0.159)	
ISO Certificate				0.01***
				(0.003)
Observations	1,585	1,557	1,585	1,550
Log likelihood	−1038.05	−1016.82	−1030.51	−1004.05
Sector effects	Yes	Yes	Yes	Yes
Regional effects	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses are robust against heteroskedasticity and province specific clustering effects; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Constant is included but not reported.

4.1 Robustness

In this section, we first check our findings using alternative measures of corruption (both perception and experience based). Second, we check the time dependence of the effect of anti-corruption strategy (of plea bargaining) by splitting our sample into two time periods for which firm surveys were available. Finally, we address endogeneity issues using an instrumental variable (IV) estimator.

In Table 5, we change the dependent variable to estimate the effect of accusations on the other dimensions of corruption. In Column 1 of the table, the dependent variable measures the percentage of the senior management's time spent in dealing with government regulations (*RegTime*). Unlike the perception-based indicator in the baseline analysis, *RegTime* captures the manager's actual corruption experience. Moreover, if government bureaucrats were abusing their regulatory powers to extract bribes from the firms, then this indicator is likely to capture any changes in this behavior due to the anti-corruption policy of the NAB.

Given that ES data do not provide separate indicators on the different aspects of regulation, the *RegTime* is an overall indicator of taxes, customs, labor regulations, licensing, and registration. Therefore, these results allow us to detect whether there is any improvement in efficiency in the overall regulatory machinery due to anti-corruption policies. Unlike our baseline model this variable is not dichotomous and so we use Ordinary Least Squares to estimate the model.

The results in Column 1 (Table 5) suggest a strong negative effect of the nabbing of government bureaucrats on firm managers' time. In other words, the greater is the number of plea-bargained corruption cases in the past, the lesser is the time private businesses have to spend in dealing with government regulations. In quantitative terms, a typical firm's management needs 5% less time per week to deal with GS with each one SD increase in the number of plea-bargained cases in the province where the firm is located. Unlike baseline results, the bargaining effect is significant and negative in this case. Thus, an increase of one SD in the amount of plea-bargaining saves only 0.3% of the weekly time managements spent

Table 5: Baseline results with alternative measures of firm-level corruption or with restricted sample

Dep. variables →	(1) RegTime	(2) Bribe2	(3) Bribe3	(4) Bribe1	(5) Bribe1
No. of Accused GS	−1.007***	−0.326*	−0.853*	−0.046***	−0.025***
	(0.136)	(0.192)	(0.478)	(0.002)	(0.001)
Plea Bargain Amount	−0.226**	0.091	−0.391**	−0.141***	0.210***
	(0.080)	(0.095)	(0.159)	(0.016)	(0.016)
Firm Age	0.240**	−0.099	−0.063	−0.067	0.146
	(0.070)	(0.099)	(0.109)	(0.125)	(0.157)
SME	−1.588***	0.052	−0.220	−0.143	−0.450**
	(0.344)	(0.162)	(0.183)	(0.185)	(0.185)
HDI	8.136	−16.293	62.842***	4.574***	0.740***
	(4.673)	(11.498)	(23.575)	(0.087)	(0.055)
Observations	1,767	1,048	492	897	688
Sector effects	Yes	Yes	Yes	Yes	Yes
Regional effects	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses are robust against heteroskedasticity and province specific clustering effects; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Constant is included but not reported.

in dealing with bureaucrats. This result also suggests that corruption is the cause of inefficiency in Pakistan and that the anti-corruption policy of plea-bargaining helps improve the regulatory apparatus of the government.[7]

In Column 2 (Table 5), the dependent variable (*Bribe2*) is again dichotomous measuring the incidents of bribery if a firm experiences at least one bribe payment across six different types of public transactions dealing with access to public utilities, building permits, operating licenses, and taxes. The effect of detection is again negative and significant. In specific terms, the result suggests that the odds of corrupt dealings decline by 92% with each single SD increase in the cases of plea-bargaining involving government officials. The bargaining effect is again insignificant.

The dependent variable in Column 3 of Table 5 measures corruption perceptions rather than experience. More specifically, the variable labelled *Bribe3* assumes a value of 1 if a formal payment is expected to secure a government contract. The coefficient of interest is again negative and significant although only at 10% level, whereas the bargaining effect is negative and significant.

In the last two columns of Table 5, we estimate our baseline model separately for business firms surveyed in 2007 and 2013. Although the results still suggest the negative influence of the number of plea-bargained cases, the effect of the plea bargained amount is negative for the firms surveyed in 2007 and becomes positive in the case of 2013. This suggests a change in the effect of the plea bargaining option on corruption over time. However, we refrain from inferring much from this result because of the non-experimental nature of our data. Nonetheless, this novel finding provides an interesting avenue for future research.

4.2 Endogeneity

Table 6 addresses the issue of endogeneity. Admittedly, the demand and supply of "corrupt transactions" is simultaneous which makes it difficult to establish causality. To handle the issue of endogeneity we used two-stage least squares (2SLS) which uses the IV estimator to capture the exogenous impact of endogenous regressor. We instrument *No. of Accused GS* using a measure of political will.

The rationale behind the use of political will is not difficult to discern. It can be argued that the strength and independence with which anti-corruption agencies pursued corruption in the government's ranks reflect the government's resolve and will to get rid of this menace (Ankamah & Manzoor E Khoda, 2018). One possible determinant of the government's resolve to avoid anti-growth practices is the number of popular votes that the ruling party receives in the last elections. As Besley, Persson, and Sturm (2010) show, the lack of political competition is associated with anti-growth policies.

7 This result complements the findings of Goel, Mazhar, Nelson, and Ram (2017) who find, using the same indicators, that less centralized government administrations save business managers' time dealing with government regulations.

Table 6: Endogeneity issues (2SLS estimates)

Dep. Variable: Bribe1 (Firm is expected to pay bribe to government officials)		
	(1)	**(2)**
No. of Accused GS	−0.142***	−0.182**
	(0.046)	(0.071)
Plea Bargain Amount	−0.039	−0.060*
	(0.024)	(0.036)
Firm Age	0.001	−0.000
	(0.027)	(0.027)
SME	−0.086***	−0.088***
	(0.025)	(0.026)
HDI	−5.936***	−7.234***
	(1.444)	(2.465)
Observations	1,585	1,585
Sector effects	Yes	Yes
Location effects	No	Yes
Time effects	Yes	Yes
First stage *F*-test	154.52	138.79
Endogeneity test (*p*-value)	0.000	0.001
Overidentifying test		13.834***

Notes: In column (1) *PopVote* is used as an instrument for *No. of Accused GS*. In column (2) *PopVote* and its square serve as the instruments.
Null hypothesis of endogeneity test states that *No. of Accused GS* can be treated as exogenous.
Overidentifying restrictions test reports the value of Sargan score test. The null hypothesis is that overidentifying restrictions are valid. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Therefore, greater popular support provides greater political will to the ruling party to take strong measures to prevent the misuse of public authority. Thus, we use the provincial level share of the ruling party's vote in the election as a proxy for its will to fight administrative corruption in government departments. This variable is denoted as *PopVote* and it comes from Chaudhry and Mazhar (2019) data set constructed specifically for Pakistan. We use this variable and its squared form to instrument the grabbing variable.

The 2SLS results using *PopVote* as instrument for *No. of Accused GS* are reported in Table 6. Both the columns include location, time, and sector effects in line with the baseline specification. In Column 1 we report only the *PopVote* as an instrument, while in Column 2 we also include its square, i.e., *PopVoteSq*. It is important to check whether our instruments are satisfying the statistical requirements necessary for a valid inference in the 2SLS procedure. To this end, we have reported a number of diagnostic tests toward the bottom of the table. For instance, first-stage F-statistics in both the regressions exceed the benchmark value of 10, suggesting a strong correlation between the *No. of Accused GS* and the *PopVote*. The Hausman test of endogeneity of the *No. of Accused GS* provides strong evidence that we cannot treat it as exogenous. Finally, the over identifying restrictions imposed by our instruments (in Column 2) are not valid as the value of the Sargan test suggests.

The coefficient of the *No. of Accused GS* in 2SLS estimates in both columns in Table 6 is significant beyond 1%. Because of the dichotomous nature of the original dependent variable we avoid interpreting the 2SLS coefficients. The results on control variables follow the earlier pattern. Thus, the firm being of small or medium size decreases the probability that it will be asked to pay a bribe by a government official. The age of the firm is insignificant and the overall level of development of a province is negatively correlated with corruption occurrence.

In sum, the results as per various specifications and after using the different forms of corruption as dependent variable clearly show that the nabbing of corrupt officials reduces incidents of corruption at the level of the business firm. Its weaknesses aside, the evidence from 2SLS regressions overcome the endogeneity in the hypothesized link between nabbing and corruption incidents and give support to our baseline results. In sum, we can claim that different statistical procedures yield consistent results.

5 Conclusion

An important issue in the literature on corruption involves the best way to deal with it. Huge monetary resources, besides time and effort, are devoted to designing effective institutions to get rid of this menace. Gathering scientific evidence on the efficacy of such measures directly informs the policy makers and is no less instructive for academicians.

This study tests the efficacy of anti-corruption measures in the context of Pakistan. Using theoretical insights, e.g., Becker (1968) and Rose-Ackerman (2010), it derives two hypotheses to test the impact of the plea-bargaining policy on corruption perceptions and corruption experiences of formal business firms.

The study gathers a unique data set on the number of accused government officials who availed the option of plea-bargain and voluntary disclosure of illicit gains. So unlike other corruption cases, these cases are unique in attracting public attention (and ire). The risk of detection and scrutiny by the NAB with the positive probability of

surrendering the ill-gotten wealth influence the cost–benefit ratio of potential bribe seekers. Two waves of the World Bank Enterprise Surveys (2007 and 2013) provide a firm-level data set of more than 2,000 firms covering the four main provinces of Pakistan to empirically test these hypotheses.

Although the econometric results support the hypotheses, the effect of the number of accusations (H1) on reducing corruption is more consistent. The results are robust against various specifications and hold as well if we divide our sample into individual surveys. With some qualifications, the results hold for the 2SLS estimator as well. Importantly, the independent effect of the amount of plea-bargaining on firm-level corruption although negative overall comes out positive if we restrict the sample to focus only on the latter half of the sample period, thus supporting hypothesis H2.1.

In terms of good effect the practice of plea-bargaining has on the perceptions and experiences of business firms and the value of resources recovered over the period under consideration, this policy may offer net social benefits. But the positive effect it exercises on corruption in the second time period suggests that it may increase corruption in the long term. Thus, it is likely that long-term expected costs exceed short-term gains.

This research is not without limitations. First, it focuses specifically on Pakistan. Although governance issues in Pakistan are not very different from other developing countries, it is difficult to tease out many generalizations. Second, the empirical analysis relies on a data set that is pooled crosssectional and is observational in nature. This reduces the reliability of the causality analysis. Nevertheless, the study serves as a motivation for future researchers to go beyond this simple analysis and add refinements to gather more reliable insights about this important area of public administration.

Acknowledgements: We are grateful to Emmanuelle Auriol and two anonymous referees for helpful comments and suggestions. All the remaining errors belong to the authors.

Conflict of interest: Authors state no conflict of interest.

Data availability statement: Data use in this research is available upon request from the authors.

References

Ali, Z. (2018). Anti-corruption institutions and governmental change in Pakistan. *South Asia Multidisciplinary Academic Journal*, *28*, 1–23. doi: 10.4000/samaj.4499.

Aniche, E. T., Alumona, I. M., & Obiwulu, U. S. (2020, February). Temper justice with mercy: A public perception of the use of plea bargain in the fight against corruption in Nigeria. *Journal of Public Affairs*, *21*(2), 1–10. doi: 10.1002/pa.2212.

Ankamah, S. S., & Manzoor E Khoda, S. M. (2018). Political will and government anti-corruption efforts: What does the evidence say? *Public Administration and Development*, *38*(1), 3–14. doi: 10.1002/pad.1815.

Bai, J., Jayachandran, S., Malesky, E. J., & Olken, B. A. (2017). Firm growth and corruption: Empirical evidence from Vietnam. *Economic Journal*, *129*(618), 651–677. doi: 10.1111/ecoj.12560.

Barnum, T. C., Nagin, D. S., & Pogarsky, G. (2020). Sanction risk perceptions, coherence, and deterrence. *Criminology*, *59*(November 2020), 1–29. doi: 10.1111/1745-9125.12266.

Becker, G. S. (1968). Crime and punishment. An economic approach. *The Journal of Political Economy*, *76*(2), 169–217. doi: 10.1086/259394.

Becker, G. S., & Stigler, G. J. (1974). Law enforcement, malfeasance, and compensation of enforcers. *The Journal of Legal Studies*, *3*(1), 1–18. doi: 10.1086/467507.

Belousova, V., Goel, R. K., & Korhonen, I. (2016). Corruption perceptions versus corruption experience: Competition for rents across Russian regions. *Journal of Economics and Finance*, *40*(1), 172–187. doi: 10.1007/s12197-014-9298-y.

Besley, T., Persson, T., & Sturm, D. M. (2010). Political competition, policy, and growth: Theory and evidence from the US. *Review of Economic Studies*, *77*(1), 1329–1352.

Boly, A., & Gillanders, R. (2018). Anti-corruption policy making, discretionary power and institutional quality: An experimental analysis. *Journal of Economic Behavior and Organization* (Elsevier B.V.), *152*, 314–327. doi: 10.1016/j.jebo.2018.05.007.

Brass, D. J., Butterfield, K., & Skaggs, B. C. (1998). Relationships and unethical behavior: A social network perspective. *Academy of Management Review*, *23*(1), 14–31. doi: 10.2307/259097.

Chaudhry, A., & Mazhar, U. (2019). Political competition and economic policy: Empirical evidence from Pakistan. *Economics: The Open-Access, Open-Assessment E-Journal*, *13*(1), 1–25.

Davis, J. H., & Ruhe, J. A. (2003). Perceptions of country corruption: Antecedents and outcomes. *Journal of Business Ethics*, *43*(4), 275–288. doi: 10.1023/A:1023038901080.

Delavallade, C. (2012). What drives corruption? Evidence from North African firms. *Journal of African Economies*, *21*(4), 499–547. doi: 10.1093/jae/ejs006.

Donchev, D., & Ujhelyi, G. (2014). What do corruption indices measure? *Economics & Politics*, *26*(2), 309–331

De Rosa, D., Gooroochurn, N., & Görg, H. (2015). Corruption and productivity: Firm-level evidence. *Journal of Economics and Statistics*, *235*(2), 115–138. doi: 10.1515/jbnst-2015-0203.

Draca, M., & Machin, S. (2015). Crime and economic incentives. *The Annual Review of Economics*, *7*, 389–408.

Dreher, A., & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice*, *155*(3–4), 413–432. doi: 10.1007/s11127-011-9871-2.

Dutta, N., & Sobel, R. (2016). Does corruption ever help entrepreneurship? *Small Business Economics*, *47*(1), 179–199. doi: 10.1007/s11187-016-9728-7.

Faccio, M. (2006). Politically connected firms. *American Economic Review*, *96*(1), 369–386. doi: 10.1257/000282806776157704.

Farooq, A., Shahbaz, M., Arouri, M., & Teulon, F. (2013). Does corruption impede economic growth in Pakistan? *Economic*

Modelling (Elsevier B.V.), *35*, 622–633. doi: 10.1016/j.econmod.2013.08.019.

Feeley, M. M. (1982). Plea bargaining and the structure of the criminal process. *The Justice System Journal*, *7*(3), 338–354. doi: 10.2307/20877672.

Fisman, R., & Svensson, J. (2007). Are corruption and taxation really harmful to growth? Firm level evidence. *Journal of Development Economics*, *83*(1), 63–75. doi: 10.1016/j.jdeveco.2005.09.009.

Galang, R. M. N. (2012). Victim or victimizer: Firm responses to government corruption. *Journal of Management Studies*, *49*(2), 429–462. doi: 10.1111/j.1467-6486.2010.00989.x.

Gaviria, A. (2002). Assessing the effects of corruption and crime on firm performance: Evidence from Latin America. *Emerging Markets Review*, *3*(3), 245–268. doi: 10.1016/S1566-0141(02)00024-9.

Goel, R. K., Mazhar, U., Nelson, M. A., & Ram, R. (2017). Different forms of decentralization and their impact on government performance: Micro level evidence from 113 countries. *Economic Modelling*, *62*(C), 171–183. doi: 10.1016/j.econmod.2016.12.010.

Goel, R. K., & Mazhar, U. (2019). Does capital punishment deter white collar crimes? *The World Economy*, *42*(6), 1873–1897. doi: 10.1111/twec.12739.

Graaf, G. De. (2007). Causes of corruption towards a contextual theory of corruption. *Public Administration Quarterly*, *31*(1/2), 39–86.

Grossman, G. M., & Katz, M. L. (1983). Plea bargaining and social welfare. *American Economic Association*, *73*(4), 749–757.

Hallward-Driemeier, M., & Pritchett, L. (2015). How business is done in developing world: Deals versus rules. *Journal of Economic Perspectives*, *29*(3), 121–40. doi: 10.1257/jep.29.3.121.

Huang, F., & Rice, J. L. (2012). Firm networking and bribery in China: Assessing some potential negative consequences of firm openness. *Journal of Business Ethics*, *107*(4), 533–545. doi: 10.1007/sl0551-01 1-1062-z.

Jiang, T., & Nie, H. (2014). The stained China miracle: Corruption, regulation, and firm performance. *Economics Letters* (Elsevier B.V.), *123*(3), 366–369. doi: 10.1016/j.econlet.2014.03.026.

Li, H., Gong, T., & Xiao, H. (2015). The perception of anti-corruption efficacy in China: An empirical analysis. *Social Indicators Research*, *125*(3), 885–903. doi: 10.1007/s11205-015-0859-z.

Miceli, T. J. (1996). Plea bargaining and deterrence: An institutional approach. *European Journal of Law and Economics*, *3*(3), 249–264. doi: 10.1007/BF00709142.

Mishina, Y., Dykes, B. J., Block, E. S., & Pollock, T. G. (2010). Why "good" firms do bad things: The effects of high aspirations, high expectations, and prominence on the incidence of corporate illegality. *Academy of Management Journal*, *53*(4), 701–722. doi: 10.5465/amj.2010.52814578.

Oh, K. (2009). Institutional transitions and firms' political behaviors. *Academy of Management Proceedings*, *2009*(1), 1–6. doi: 10.5465/amb2009.44268298.

Olken, B. A. (2009). Corruption perceptions vs. corruption reality. *Journal of Public Economics*, *93*(7–8), 950–964.

Paunov, C. (2016). Corruption's asymmetric impacts on firm innovation. *Journal of Development Economics* (Elsevier B.V.), *118*, 216–231. doi: 10.1016/j.jdeveco.2015.07.006.

Polinsky, A. M., & Shavell, S. (2001). Corruption and optimal law enforcement. *Journal of Public Economics*, *81*(1), 1–24. doi: 10.1016/S0047-2727(00)00127-4.

Rand, J., & Tarp, F. (2012). Firm-level corruption in Vietnam. *Economic Development and Cultural Change*, *60*(3), 571–595. doi: 10.1086/664022.

Reingnaum, J. F. (1993). The law enforcement process and criminal choice. *International Review of Law and Economics*, *13*(2), 115–134. doi: 10.1016/0144-8188(93)90001-L.

Rose-Ackerman, S. (2010). The law and economics of bribery and extortion. *Annual Review of Law and Social Science*, *6*, 217–238. doi: 10.1146/annurev-lawsocsci-102209-152942.

Rose-Ackerman, S. (1978). *Corruption: A study in political economy*. New York: Academic Press.

Schulze, G. G., & Frank, B. (2003). Deterrence versus intrinsic motivation: Experimental evidence on the determinants of corruptibility. *Economics of Governance*, *4*(2), 143–160. doi: 10.1007/s101010200059.

Tonoyan, V., Strohmeyer, R., Habib, M., & Perlitz, M. (2010). Corruption and entrepreneurship: How formal and informal institutions shape small firm behavior in transition and mature market economies. *Entrepreneurship: Theory and Practice*, *34*(5), 803–831. doi: 10.1111/j.1540-6520.2010.00394.x.

Van Vu, H., Tran, T. Q., Van Nguyen, T., & Lim, S. (2018). Corruption, types of corruption and firm financial performance: New evidence from a transitional economy. *Journal of Business Ethics*, *148*(4), 847–858. doi: 10.1007/s10551-016-3016-y.

Wang, Y., & You, J. (2012). Corruption and firm growth: Evidence from China. *China Economic Review* (Elsevier Inc.), *23*(2), 415–433. doi: 10.1016/j.chieco.2012.03.003.

Wu, X. (2009). Determinants of bribery in Asian firms: Evidence from the World business environment survey. *Journal of Business Ethics*, *87*(1), 75–88. doi: 10.1007A10551-008-9871-4.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. 2nd ed. Cambridge, MA: MIT Press.

Zhou, X., Han, Y., & Wang, R. (2013). An empirical investigation on firms' proactive and passive motivation for Bribery in China. *Journal of Business Ethics*, *118*(3), 461–472. doi: 10.1007/s10551-012-1596-8.

Zhou, J. Q., & Peng, M. W. (2012). Does bribery help or hurt firm growth around the world? *Asia Pacific Journal of Management*, *29*(4), 907–921. doi: 10.1007/s10490-011-9274-4.

Appendix I Questions Related to Bribe in World Enterprise Surveys Considered in this Study

Bribe1. This variable is based on ES survey questions J7a and J7b. The precise statement of the question is as follows: *It is said that establishments are sometimes required to make gifts or informal payments to public officials to "get things done" with regard to customs, taxes, licenses, regulations, services etc. On average, what percentage of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?*

RegTime. This variable is created from ES survey question J2. The precise statement of the question runs as follows: *In a typical week over the last year, what percentage of total senior management's time was spent on dealing with requirements imposed by government regulations?* [*By senior management I mean managers, directors, and officers above direct supervisors of production or sales workers. Some examples of government regulations are taxes, customs, labor regulations, licensing and registration, including dealings with officials and completing forms*].

Bribe2. This variable is generated from questions asking about informal payment/gift expected when apply for permit, public utilities connection, license or during inspection. The general form of the question is as follows: *In reference to that application for an* [*name of the utility, permit, license, inspection*], *was an informal gift or payment expected or requested?*

Bribe3. The indicator is created from the variable J6 and J6a. The questions are as follows: (*J6*) *Over the last year, has this establishment secured or attempted to secure a government contract?*

(*J6a*) *When establishments like this one do business with the government, what percent of the contract value would be typically paid in informal payments or gifts to secure the contract?*

Appendix II Voluntary Return and Plea Bargain Law

Section 25 of National Accountability Ordinance (NAO) (at http://nab.gov.pk/Downloads/nao.asp#Voluntary_28) is as follows:

[25. (a) Notwithstanding anything contained in Section 15 or in any other law for the time being in force, where a holder of public office or any other person, prior to the authorization of investigation against him, voluntarily comes forward and offers to return the assets or gains acquired or made by him in the course, or as the consequence, of any offence under this Ordinance, the Chairman NAB may accept such offer and after determination of the amount due from such person and its deposit with the NAB discharge such person from all his liability in respect of the matter or transaction in issue:

Provided that the matter is not sub judice in any court of law.

(b) Where at any time after the authorization of investigation, before or after the commencement of the trial or during the pendency of an appeal, the accused offers to return to the NAB the assets or gains acquired or made by him in the course, or as a consequence, of any offence under this Ordinance, the Chairman, NAB, may, in his discretion, after taking into consideration the facts and circumstances of the case, accept the offer on such terms and conditions as he may consider necessary, and if the accused agrees to return to the NAB the amount determined by the Chairman, NAB, the Chairman, NAB, shall refer the case for the approval of the Court, or as the case may be, the Appellate Court and for the release of the accused.

(c) The amount deposited by the accused with the NAB shall be transferred to the Federal Government or, as the case may be, a Provincial Government or the concerned bank or financial institution, company, body corporate, co-operative society, statutory body, or authority concerned within 1 month from the date of such deposit].[8]

8 http://nab.gov.pk/Downloads/nao.asp#Voluntary_28 (accessed 8 September 2019).