

SYNOPSIS OF THE THESIS

CONTROLLING CORRUPTION: ROLE OF

BUREAUCRATIC COMPETITION,

PUNISHMENT AND MEDIA

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1.1 Backdrop

Corruption in economics literature is defined as the misuse of public office for private gain. Corruption can take various forms including petty corruption in routine activities to large scale bribery. For instance, “police corruption” were widespread in Hong Kong in 1960s where incidences ranged from routine petty corruption to large-scale bribery at the institutional level. Transparency International (2011) reports that 54 percent of respondents of their survey conducted in India had to pay a bribe to obtain a public service. Corruption can also take the form of embezzlement of government allocation in different welfare schemes. In India, based on a survey on NREGS¹ beneficiaries, who receive job card from the government in guaranteed employment program, in different districts of Orissa and Andhra Pradesh, it was found that 70 to 80 percent of the NREGS labour budget was embezzled before it reached the beneficiaries². Similarly, 44 percent of food grain under Targeted Public Distribution System in India was found to be leaked before it reaches the intended beneficiaries (Khera, 2011). Historically, corruption has come down drastically in the developed part of the world over the last century; but it is still quite rampant at the developing countries and considered as a major obstacle to their development³.

The form of corruption that is prevalent in routine activities in the developing world is bureaucratic corruption involving bribery. The bribery may take two alternative forms: (i) extortion, where an agent meets a required compliance criterion to be eligible to obtain

¹ National Rural Employment Guarantee Scheme.

² See Niehaus and Sukhtankar (2013a, 2013b).

³ See Bardhan (1997).

a government service but is forced to pay a bribe by the administering bureaucrat/official; and (ii) collusion, where a non-complying agent and an official enter a mutually beneficial bribe agreement. An example from Mishra (2006) can be used to differentiate between these two concepts. Taxi owners in India must undergo a periodical compliance inspection to ensure that the emission is below the permissible level. This compliance requires a fixed investment, which the taxi owners may or may not choose to make. Collusion refers to the case where a taxi-owner has not invested in emission control and the inspector takes a bribe from the polluting taxi-owner to issue the clearance certificate. Alternatively, the inspector may be able to submit an unfavourable report or credibly threaten to report a non-polluting taxi as a polluting one. In such a case, bribery may still occur, but as a form of extortion. Bertrand et al (2007) provides another example of the two types of bribery in the context of driving license applications in India where officials have been found to arbitrarily fail applicants in the driving test so as to procure bribe, which is a case of extortion and on the other hand, it is also not uncommon to find applicants obtain the license without knowing how to drive, in exchange for a bribe which is a case of collusion. Instances of extortion were also prevalent in Hong Kong in 1960s as government officials demanded “tea money” for providing essential services to the deserving ones. For example, ambulance crews would ask for tea money before picking up a sick person or hospital attendants asked for “tips” before giving patients a bedpan or a glass of water⁴.

The two forms of bribery also have implications for social welfare, which must also be clear from the examples cited above. While extortion is undesirable in terms of victimization of complying agents and has distributional implication, it does not generate any negative externality to the society. On the other hand, collusion does not have a victim, but violates compliance generating negative externality. It also has distributional

⁴ See Hseih (2017).

implication. Accordingly, a literature has evolved that studies the incidence of the two forms of bribery and discusses the anti-corruption strategies for controlling them. However, the interdependence between extortion and collusion has been rarely studied, even though they typically coexist in a bureaucracy.

It is expected that the strategies for controlling either one of extortion or collusion would affect the incidence of the other. Therefore, the question arises that what happens to extortion and collusion as we implement alternate anti-corruption strategies? What would be the best strategy to prevent occurrence of both extortion and collusion? Is there any conflict between corruption-control strategies and welfare maximization objective of a government? Beyond the standard strategies of enforcement and bureaucratic reform, what role judicial efficiency, compliance cost and media-watch plays in controlling extortion and collusion? This thesis focuses on answering these questions in a framework that allows for coexistence of both extortion and collusion.

Within the ambit of strategies to control corruption, some have direct impact on corruption, and some have indirect impact. The strategies having direct impact include prize and punishment in the form of efficiency wage⁵ and both formal and informal checks and balances where any agent involved in corruption can be sued thereby making corruption costly. Based on the definitions of extortion and collusion, since the former refers to a situation where an agent complies with the legal requirement, in this case it is the bribe-taker who violates the law. In contrast, in collusive corruption both the bribe giver and bribe taker violate the law.

⁵ See Becker and Stigler (1974). That raising civil service wages can effectively deter corruption has later been tested by Rijckeghen and Weder (2001) empirically who find a statistically significant negative relation between corruption and relative civil service wages. The results are later confirmed by An and Kweon (2017) where the effect is found to be particularly significant for non-OECD countries characterised by high corruption.

Conventionally enforcement has taken different forms for extortion and collusion. In a bureaucracy characterised by extortion, since the bribe giver is the victim, there is always a possibility of self-reporting by the same, and an asymmetric punishment is often advocated where the bribe taker alone is punished (Basu et.al. (2016)). Collusion on the other hand is victimless and neither the bribe taker nor the bribe giver has any incentive to self-report which makes it more difficult to detect. In this case, the incidence may be discovered by a third party such as media. However, one of the two parties involved can also turn out to be a whistle blower and call out the corrupt act. The consequences of leniency in enforcement for the whistle blower in case of collusive corruption has also been discussed in the literature (Buccirossi and Spagnolo, 2005). However, question remains that since societies generally experience both extortion and collusion together, what happens to these when formal enforcement for both, in the form of penalty, is introduced. Do enforcement strategies for controlling corruption differentially affect collusion and extortion outcomes, thus having a *corruption distribution effect*? Are maximal penalties socially optimum? These questions are addressed in the third chapter of the thesis which broadly looks at the impact of introducing a penalty as a corruption mitigation strategy on extortion and collusion and goes on to analyze social welfare maximizing penalty.

Beyond enforcement, indirect factors such as morality of the parties involved, and their peer effect, also matter in persistence of corruption.⁶ Moral costs that arise from the failure to adhere to the norms existing in the society may have important implications for occurrence of corruption as they deter one from participation in bribery. Some recent papers in experimental economics like Barfot et al. (2019), Gächter and Schulz (2016) suggest that intrinsic honesty of the officials also matters in this respect. Further, within the indirect

⁶ See Andvig and Moene (1990) and Dhillon et al (2017).

factors that influence corruption, the existing literature points out that media-freedom plays an important role in controlling corruption⁷. To understand whether higher media freedom can influence bureaucratic corruption which entails both extortion and collusion is an interesting research question. The fourth chapter of the thesis takes up this issue. Considering both direct and indirect factors that influence corruption, it analyses how extortion and collusion incidences are affected if morality and enforcement interact. Is there a peer effect/network effect on the officials that work differently for extortion and collusion? What happens to the moral standard of a society in a country which experiences greater media freedom? These questions are addressed in the fourth chapter of the thesis, which also brings out the importance of compliance cost, efficient judiciary and reapplication cost in designing strategies for controlling corruption.

Apart from strategies like enforcement, media freedom, compliance cost, reapplication cost discussed above, a bureaucratic reform that changes administrative structure has also been considered as an effective anti-corruption strategy. It is often argued that introduction of competition among officials in delivery of public services may reduce corruption in the same way introduction of competition between the firms ensures market efficiency. A monopoly bureaucracy is thought to breed corruption given the indispensability of the government official in delivery of a service. Introducing competition among officials could reduce corruption by eliminating this indispensability as beneficiaries would have outside options. The price competition among officials to retain their customer drives the bribe rate down to zero and corruption is eliminated⁸. However, it is important to note that as the bribe rate falls, participation in bribery becomes less costly. This expands the extensive margin of corruption. Chapter 2 studies the impact on

⁷ See Starke et al. (2016).

⁸ See Rose Ackerman (1978) and Shleifer and Vishny (1993).

introduction of competition in a bureaucracy on both the intensive and the extensive margin of extortion and collusion. Does a competitive bureaucracy unambiguously reduce both extortion and collusion? It uses various measures of corruption to answer the question. It also looks at the welfare impact of introduction of competition in a bureaucracy and checks whether the corruption and the welfare move in the same direction or in the opposite direction.

In the next section we review the literature relevant to our study.

1.2 Survey of Literature

The existing literature on corruption, as defined earlier, is diverse. Svensson (2005) and Bardhan (1997) have discussed various aspects of corruption. The authors discuss role of corruption in development process focusing on aspects of growth and efficiency. Commonly advocated anti-corruption mechanisms such as competition and monetary incentives in the form of higher wages for bureaucrats, have also been discussed.

In terms of measuring corruption, while there are popular perception and survey-based measures⁹ that have been used in the empirical literature, Mendez and Sepulveda (2010) have discussed three alternate objective corruption measures: corruption incidence, relative corruption incidence and corruption rents in a theoretical model of bribery and investment. Foster, Horowitz and Mendez (2013) provide the axiomatic foundations for the measures of corruption mentioned above. One of these measures of corruption has been widely used in Cadot (1987), Mookherjee and Png (1995), Bliss and Di Tella (1997), Guriev (2004) and Barron and Olken (2009). In the present thesis, we use the corruption incidence and corruption rent measures following Mendez and Sepulveda (2010).

In the context of bureaucratic corruption, there exists a literature that addresses the interplay between collusion and extortion. However, the treatment of extortion in this interplay differs from the one in this thesis. For instance, Polinsky and Shavell (2001) consider a general setting of law enforcement, where corruptible officers can leverage their ability to frame innocent civilians in order to impose fraudulent charges and extract extortionary payments. While the authors advocate maximal penalties for collusion and reward to officials for honest behavior, extortion is advised to be left unsanctioned since otherwise it might lead to an increase in the bribe rate or increase in the risk of innocent civilians being framed. This finding is different from that in our thesis where extortion is

⁹ See Svensson (2005).

also punished in equilibrium. In a recent paper, Banerjee and Vaidya (2019), extortion appears purely in the form of over assessment of taxable income due to an officer's inherent spiteful behavior when an under-reporting taxpayer rejects his bribe offer. Hindriks et.al. (1999) focus on similar mix of policy instruments as Polinsky and Shavell (2001) to examine the equity and efficiency implications of taxation systems in which officers can extract bribes and also threaten to extort citizens with over assessment of taxable income. They show that poorer agents are vulnerable to extortion while the rich are vulnerable to collusion. This is in contrast to our thesis where collusion is a low-revenue firm phenomenon and extortion is experienced by high-revenue firms.

Becker and Stigler (1974) discuss monetary incentives to improve the quality of enforcement to control crime or violation. The authors advocate raising the salaries of enforcers beyond what they can derive from elsewhere, such that on successful conviction, the difference in salaries creates dismissal cost which can more than offset the gain from malfeasance. Dhillon, Nicolo, and Xu (2017) show that raising monetary compensation may perversely incentivize reputation-concerned public officials to behave corruptly. Marjit and Shi (1998) point to the ineffectiveness of such bonuses when the tax officer's monitoring effort is endogenous. Mookherjee (1997) also shows that a policy mix aimed at inducing law-abiding behavior needs to be comprehensive, an integral part of which is rewards to law enforcers. Tirole (1986) and Mookherjee and Png (1995) also examine the role of incentives for bureaucrats in mitigating corruption. Das-Gupta and Mookherjee (1998) mention the difficulty in achieving such all-encompassing reforms under decentralized regulatory structure. For example, the tax administration is often not granted autonomy over its personnel management and has to comply with the general rules governing employment of civil servants across all government agencies. Furthermore,

higher rewards to tax officers may discourage tax evasion and bribery but has the credible threat of extortion in the form of over assessment of taxable income.

There is another strand of the literature that only considers extortionary corruption where bribe is sought from citizens in spite of them acting lawfully, for example Basu et.al. (2016). The central question in this paper is who should be penalized for corruption. They find that imposing a penalty on the bribe-taker incentivizes the honest citizen to report such malfeasant act and do have the possibility of reducing this practice. Abhink et.al (2014) provides experimental support to this outcome.

Ackerman (2010) cites country wise instances of nature of penalties on firms and officials based on the type of offense. In 1990s in Chile, while bribe giving was a criminal offense, accepting the same was not unless it followed an act of wrongdoing. The current Chilean law treats both bribe giver and taker symmetrically. However, if the bribe payer responds to a bribe demand rather than volunteering the payment, the maximum prison sentence is reduced. Similarly, Romania does not sanction the bribe payer if the same had to respond to an extortion demand.

Apart from penalty and reward, other strategies to mitigate corruption have also been considered in the literature. These include introduction of leniency policy for either parties involved in corruption (Spagnolo and Buccirosi, 2005), or a reward to one or both parties involved in collusive bribery for self-reporting (Abbink and Wu, 2017).

The current thesis differs from the enforcement literature along the following lines. First, in defining extortion. Unlike framing or harassment due to spite, the thesis considers pure extortion i.e., a situation when a compliant agent is denied a good/service by a corrupt bureaucrat to extract a bribe. Second, it considers implementation of penalty when both extortion and collusion co-exist. Third, in the treatment of punishment, instead of letting extortion go unsanctioned, the thesis considers punishment for extortion also but only for

the bribe giver alone like Basu et.al. (2019). No leniency is considered for collusion and both parties involved are punished.

In a theoretical framework of crime, Becker (1968), advocates that the optimum penalty rate be decided by balancing the marginal benefit and marginal cost of crime to the society. Since for petty crimes the social marginal benefit of reduced crime may not catch up to the social marginal cost of strict enforcement, whereas for severe crimes, the marginal benefit of maximum penalty far exceeds the marginal cost of enforcement. Results derived in chapter 3 of the thesis are broadly aligned with these findings where we obtain that for low intensity of negative externality the social marginal benefit of reduced negative externality and the social marginal cost of undertaking higher qualifying investment balances at an intermediate range of penalty. For high intensity of the negative externality the marginal benefit of increased penalty far exceeds the marginal cost, and the welfare function becomes monotonically rising, producing ‘Becker’s Conundrum’.

While formal enforcement includes checks and balances put in place by legal institutions, there are also external factors that exercise informal control on corruption such as the media. Starke et al. (2016) explain six different ways in which a free press helps to combat corruption. First, by acting as watchdogs which leads to investigations by official bodies followed by convictions of corrupt political actors; second, by increasing the effectiveness of anti-corruption institutions by exposing their flaws; third, by providing a civic platform to lodge and voice complaints thereby contributing to the formation of public opinion; fourth, by enhancing general transparency by providing information about corruption, which reduces both individual and systemic corruption (Kolstad & Wiig (2009), Lindstedt and Naurin (2010)); fifth, as a deterrent by increasing the likelihood of exposure of the corrupt act and hence of punishment or reputation loss; sixth, in intangible ways (Stapenhurst, 2000) through “enhanced political pluralism, enlivened public debate and

greater sense of accountability among politicians, public bodies and institutions”. The US has been considered to achieve significant reduction in its 19th century political corruption through media-freedom and judicial efficiency (Glaeser and Goldin, 2006). The existing empirical literature (Chowdhury (2004), Bhattacharya and Hodler (2015), Kalenborn and Lessmann (2013) etc.) show that media-freedom plays an important role in controlling political corruption, which is essentially collusive in nature.

There are also case studies on countries, which have successfully reduced corruption, that highlight the role of the factors mentioned above. For instance, Singapore, Hong Kong seems to have succeeded to reduce corruption in its police force through stricter enforcement ((Quah (2007) and Hseih (2017))), the US has been considered to achieve the same through media-freedom and judicial efficiency (Glaeser and Goldin (2006)).

Another strand of literature exists that focuses solely on the impact of a change in the bureaucratic regime on corruption. Susan Rose-Ackerman (1978) suggested to introduce competition among officials receiving bribes to reduce corruption. On bribe demand, the existence of competing officials to reapply to would bid down the corruption at equilibrium.

Becker and Stigler (1974) also discuss that competition among enforcers can reduce punishment and hence deterrence to crime if the amount paid in bribes is significantly less than the monetary equivalent of the punishment as competition among enforcers lowers the market price of bribes and in turn bribery reduces punishment and thus deterrence.

Shleifer and Vishny (1993) consider a theoretical model where the supply of a government produced good can be artificially restricted by public officials who have the power to extract bribes. In this case, structures of government institutions and political process are important determinants of corruption. For instance, if two complementary goods are disbursed by two independent monopoly agencies, each ignores the effect of raising its bribe demand on the other agency’s demand for the bribe. Accordingly, each set

a higher bribe leading to lower output and thus a lower aggregate bribe. Alternatively, if each one of the goods can be supplied by at least two government agencies, given collusion between several agents is difficult, bribe competition between the agencies will drive the level of bribes down to zero.

Ahlin and Bose (2007) examine bribery in a dynamic setting with a partially honest bureaucracy. The authors argue that introducing competition among officials, such that applicants can leave one official and search for another can lead to inefficiencies. The option of re-applying lowers the efficient applicants' willingness to pay a bribe and delays or denies them licenses. It also allows corrupt officials to license more inefficient candidates. The authors conclude that when ability to pay the bribe is widespread, monopolistic licensing is more efficient than competitive licensing.

Drugov (2010) studies the welfare consequences of introducing competition between bureaucrats in a theoretical model, in presence of both extortion and collusion. Identical firms are considered that can improve the production process at a lumpsum cost by undertaking an investment to eliminate negative externalities of production which is an outcome of collusive corruption. Results show that introducing a competitive bureaucracy creates more ex-ante incentives for firms to invest. On the other hand, in terms of welfare monopoly regime is better at implementing ex post allocation i.e., given the investment decisions of the firms. If firms are heterogeneous in their cost, the total effect on welfare becomes ambiguous as introducing competition has two opposing effects: while more firms invest in a better technology the firms that still do not invest decrease the welfare. However, how extortion and collusion individually might be affected by the cost of investment remains unexplored.

The literature that explores the effect of a change in the bureaucratic regime on corruption unanimously agrees on the lowering of corruption in terms of bribe rate as a

competitive bureaucracy is introduced. This thesis contributes to this strand of literature by exploring what happens to corruption when we distinguish between extortion and collusion and take into account both the extensive and intensive margin, in a competitive bureaucracy. Further, it also looks at the simultaneous movement of incidence of extortion and collusion and social welfare and discusses the role of investment/compliance cost as a potential policy instrument to control corruption.

The existing literature has discussed that the morality and peer effect of the participants matter in persistence of corruption. Andvig and Moene (1990) study the interaction of monetary incentive, enforcement, and morality in determination of extent of corruption in an economy. They conclude that there can be multiple self-fulfilling corruption equilibria for different distributions of moral cost in a framework where both supply and demand of corrupt acts are considered. Dhillon et al (2017) study the interaction of monetary incentive, enforcement and morality in determination of extent of corruption in an economy. Traxler (2010) considers morality in context of conditional cooperative tax evasion where tax morale is a social norm for tax compliance and find that the strength of the norm is shaped endogenously, depending on the share of evaders in the society. Results show that taxpayers' decision to evasion depends on the others' compliance. Fisman and Miguel (2007) empirically studied the relation between corruption and non-compliance and concluded that corruption norms present in a country predict the tendency to violate rules. Specifically, they collected data on parking violations by United Nations diplomats living in New York City during 1997 to 2002, to find that the diplomats from low (high) corruption countries have lower (higher) number of violations. The authors also found a significant reduction in violations following the implementation of legal enforcement in 2002.

1.3 Outline of the Chapters

The thesis contains three core chapters. This section provides a brief description of the chapters in the thesis.

Chapter 2 studies the impact of introducing competition among officials in a bureaucracy on extortion and collusion at both the intensive and extensive margin. It uses two alternate objective measures of corruption: CI (corruption incidence) and CR (corruption rent) as discussed in Mendez and Sepulveda (2010) and Foster, Horowitz and Mendez (2013) for its purpose. The theoretical model constructed in this chapter assumes that firms, who apply for a production license differ in terms of their revenue potential and must adopt an emission reducing clean technology at a cost, to be qualified to produce. The licenses are administered by both inherently honest and inherently corrupt officials with exogenously determined shares. The scope of corruption appears when a corrupt official disburses the license as she would grant license to any firm in exchange of a bribe. Consequently, two types of bribes are possible: (i) extortion: when a qualified firm pays bribe; (ii) collusion: when an unqualified firm pays bribe and while collusion has negative welfare implication as it creates pollution, extortion has no such problem. The chapter, first, considers a monopoly bureaucracy, where each firm is assigned to a single official who administers the license. Having full indispensability, a corrupt official demands the same amount of bribe for both extortion and collusion. As competition among the officials is introduced, several officials disburse the same license and firms have outside option. Reapplication is possible in both regimes, however, unlike monopoly in a competitive regime the firms can either stick to the same official or reapply to a different official chosen randomly in the next period. Although reapplication involves a cost of delay, it increases the bargaining strength of the firm and reduces the bribe rate compared to monopoly and at the same time, differs for qualified and unqualified firms, the former being lower than

the later. Thus, while a competitive bureaucracy lowers corruption by lowering the bribe rate, leads to more of the firms get incentive to qualify under competitive bureaucracy at the time of application itself, increasing the frequency of extortion. The chapter specifically analyses what happens to extortion and collusion and overall corruption as a competitive bureaucracy is introduced. Social welfare implications are then discussed.

Chapter 3 introduces monetary penalties for corruption and explores the effect on both extortion and collusion following which the socially optimal penalty is obtained. In doing so, it considers, like Chapter 2, a heterogeneous set of firms whose revenue follows a uniform distribution. The government enforcement agency moves first to choose an anti-corruption penalty. As compliance, a firm needs to incur a costly emission reducing investment and apply for a license that enables it to continue production without generating a negative externality. The firm can also choose not to invest but apply, in which case it generates a negative externality on production. In the third stage a reviewing officer from a monopoly bureaucracy reviews the application and decides to engage in corruption or not and correspondingly extortion and collusion follow. In the fourth stage a firm decides whether to accept or reject the Nash Bargaining bribe offer by the officer. We assume that while the cost of emission reducing investment is fixed, the cost of the negative externality generated by a polluting firm is proportional to its revenue. Penalties are implemented to arrest corruption, and as penalties increase, more firms decide to undertake the investment in emission reducing technology. This increases the cost to society in terms of the costly aggregate investment. However, the cost to society in terms of negative externality is lowered as less firms collude. The social welfare maximizing penalty is then obtained following this trade-off. Correspondingly, the subgame perfect equilibrium corruption distribution is then determined. An imperfect legal system is considered such that an investing firm always chooses to self-report extortionary corruption irrespective whether it

accepts or rejects the bribe demand but, conviction is not certain. The probability of conviction of collusion is also lower than that of extortion, as it is a mutually beneficial side contract and hence, is not self-reported but it has the possibility of being discovered by the media or some other third party. Offenders involved in both forms of corruption are punished with symmetric penalty conditional on successful conviction. The socially optimal penalty and the resultant subgame perfect equilibrium of corruption distribution, that is, the pattern of corruption that exists for different revenue levels are correspondingly determined.

Chapter 4 models a situation where a firm irrespective of its size needs to undertake a costly qualifying investment to be eligible for a production license. The scope of extortion and collusion arises as the firm faces an official for delivery of the license. While in extortion, a qualified firm is charged with a bribe; the collusive bribe hides the violation. The probability of conviction is higher in extortion than collusion since the firm, being extorted, reports the incident on its own. In the case of collusion both the sides have incentive to hide the deal. A collusion can be uncovered only by a watchful media. Since both the sides are guilty in the case of collusion, the penalty falls symmetrically on both; but in the case of extortion the penalty falls only on the official. The official is corruptible, torn between the net expected benefit that he can receive from bribery and the moral cost that he suffers from his act. He participates in corruption if the former overpowers the later. There is a moral standard in the administration, which appears as a cost for individual officials for their involvement in bribery. It depends on the proportion of officials involved in corruption. Although, it is not that all the officials are equally sensitive to the moral standard, a high moral standard throws a spanner on an official's behaviour in terms of peer effect/network effect. The chapter derives different sensitivity thresholds of officials for participation at extortion and collusion and shows, given a moral standard, the penalty

threshold that prevents occurrence of extortion is lower than the penalty threshold that prevents occurrence of collusion. The chapter endogenously determines the total number of corrupt officials at equilibrium, who are engaged in both extortion and collusion. It goes to show, from a policy perspective increases in penalty, and probability of conviction of collusion play a significant role in mitigating corruption. The chapter discusses the participation of the firm in compliance and also shows the corruption outcomes for different ranges of compliance cost, coupled with the reapplication cost. A high compliance cost induces the firm to avoid the investment and indulge in collusion. Thus, in this case a higher reapplication cost is required to counter this incentive. The chapter shows that under a high compliance cost, the scope of extortion is much more restricted than the scope of collusion. As the cost of qualification falls, the scope of collusion falls, but the scope of extortion rises. The chapter then discusses the impact of policy instruments: penalty and conviction probabilities of extortion and collusion on the firm's compliance participation and shows that increase in penalty and conviction probabilities of extortion and collusion increases the firm's incentive to invest in compliance. Interestingly the chapter finds that in case of high compliance cost, an increase in the conviction probability of collusion is more effective in reducing the equilibrium number of corrupt officials compared to an increase in the penalty. This has important implications for the role of media in controlling corruption and raising the society's moral standard. Since conviction probability of collusion increases with active media watch, the effect of role of media as a watchdog has serious policy implications for reducing corruption. The chapter also provides an anecdotal evidence in support of the above claim. Using cross-country data, it also provides an anecdotal evidence highlighting the relation between non-compliance and media-freedom.

In the next section we summarize the results derived in the three core chapters of the thesis and contribution to the literature.

1.4 Results and Contribution to the Literature

In this section we summarize the results derived in the three core chapters of the thesis.

Chapter 2 studies the effect of introducing competition among officials in a corrupt bureaucracy on extortion and collusion. Specifically, we ask whether extortion and collusion are uniformly affected due to an administrative regime change from monopoly to competition. The results show that under a competitive bureaucracy the frequency of extortion rises as per corruption incidence (CI) measure but, due to lower extortion bribe rate the same cannot be concluded for the corruption rent (CR) measure. The chapter also argues, both CI and CR of collusion falls under competitive regime. Both extortion and collusion taken together CI remains the same and CR falls as competition is introduced in a bureaucracy. The chapter also discusses the social welfare implications and shows that replacing monopoly if competition introduced in a bureaucracy through an administrative reform, the corruption and welfare measures of the economy may not move in the same direction. There can be outcomes where welfare increases as competition is introduced in a bureaucracy but at the same time corruption also increases. The chapter contributes to the literature by pointing out that the two different types of bribery that is present in an economy viz. collusion and extortion can be differentially affected by introduction of bureaucratic competition: in fact, one can substitute the other. So, the net outcome of introduction of bureaucratic competition on corruption-measures of an economy is not obvious. Among other exogeneous factors, it also depends on the way corruption is quantified and the conventional wisdom that the corruption falls with introduction of competition in bureaucracy does not necessarily survive. It shows that the type of conclusion we draw depends on the type of corruption we are looking at and the type of measure we are using. Another contribution of this chapter is in showing that with

introduction of competition in a monopoly bureaucracy the corruption measure and the welfare measure of an economy may move in different directions.

In chapter 3, in response to government's choice of anti-corruption penalty, firms decide whether to invest in emission-reducing technology or not and we explore the effect of a monetary penalty on the distribution of corruption for various penalty ranges. Results show that an increase in the penalty leads to a non-monotonic *corruption distribution*. We show that when the extent of negative externality is low, the socially optimal penalty is within a "very low" range. Low revenue firms choose not to invest and indulge in collusion while high revenue firms choose to invest but encounter extortion. An increase in the extent of negative externality causes the optimal penalty to increase within this range and consequently some of the low revenue firms switch from no-investment to investment. This reduces the incidence of collusion, but the corruption distribution remains the same. When the extent of the negative externality reaches a critical level, the optimal penalty jumps from the "very low" range to a "medium range". This results in a further reduction in the incidence of collusion and some of the low revenue firms who switch from no investment to investment interestingly face no corruption because for them the penalty is above their threshold penalty levels that sustain collusion and extortion. The low revenue firms that stick to no-investment continues to indulge in collusion while the high revenue firms continue investing but face extortion. Strengthening of negative externality causes an increase in the optimal penalty within this range and this further reduces the incidence of collusion. As the extent of negative externality becomes very high, the cost imposed by it also becomes very high. Therefore, it becomes imperative to eliminate the negative externality by eradicating collusion. Consequently, the optimal penalty becomes high enough to eliminate collusion and all firms choose to invest. However, extortion remains as a high-revenue phenomenon. All forms of corruption are eliminated only when the

penalty becomes prohibitively high. These findings suggest that for low negative externality, a penalty that eliminates collusion and hence negative externality is not socially optimal. The contribution of the chapter is novel and counterintuitive. First, we simultaneously characterize extortion and collusion equilibrium at alternative penalty ranges and show non-monotonicity of extortion incidence, which is counterintuitive. Second, it matches the collusion and extortion incidence with the revenue distribution of the firms. While collusion is a low-revenue firm phenomenon, extortion is that of a high-revenue firm. Third, we show that the elimination of extortion may not be the social welfare-maximizing choice for a society. The welfare maximization under certain situations may demand existence of either one or both types of corruption.

In chapter 4 we theoretically consider the interaction between enforcement and morality, with four distinct points of departure from the earlier literature: (i) it makes a distinction between sensitivity to moral standard and moral standard itself, while the former is an intrinsic value to an official, the latter is function of the size of network of corrupt officials. (ii) it clearly demarcates how the sensitivity to moral standard differs for extortion and collusion leading to different incidences of the same. (iii) it brings out the importance of penalty, media-freedom and judicial efficiency in influencing the number of corruptible officials the corresponding network effects it generates. (iv) it analyses how penalty, compliance cost, media-freedom, efficient judiciary and reapplication cost are important policy instruments for designing strategies to control corruption. The officials with their sensitivity lower than morality thresholds, endogenously determined in the model, participate in corruption if and only if the punishment levels are also below certain thresholds, also endogenously determined in the model. The paper shows that under reasonable assumptions, both the morality threshold and punishment threshold for extortion lie below the similar thresholds for collusion, and the scope of extortion is more restricted

compared to the scope of collusion. At low compliance cost, however, extortion prevails. At low and medium penalty ranges, while media-watch plays an important role in controlling both types of corruption, the efficiency of judiciary matters if only extortion prevails in the bureaucracy. While discussing the policy implications, we have highlighted the role of penalty, compliance cost, cost of reapplication and conviction probabilities of extortion and collusion. In presence of high compliance cost, the number of corrupt officials at equilibrium is decreasing in both penalty and the probability of conviction of collusion. The latter, which depends on media-watch is however more effective in lowering the number of corrupt officials and correspondingly in raising the societal moral standard. The model predicts that the countries with less media activism is expected to see more violation of law and provides an anecdotal evidence to support this prediction. It supplements the widely cited study by Fisman and Miguel (2007) with cross-country media-freedom data for this purpose. It takes the country rank of Fisman and Miguel (2007) on violation of parking norm and find its Spearman's rank correlation with ranking of the countries on the basis of their average media-freedom score in 1997-2002, calculated from Press Freedom scores provided by Freedom House. The outcome is consistent with the theoretical prediction of the model that the diplomats from the countries with lower media freedom were more prone to rule-violations. The chapter makes several contributions to the existing literature. First, it shows, how monetary penalty, moral standard and individual-specific sensitivity to moral standard interact to determine the scope extortion and collusion in a bureaucracy. Second, it shows, how changes in penalty and conviction probability of collusion generates a network effect of corruption by influencing the number of corrupt officials. Third, since bureaucratic corruption is associated with execution of laws, this chapter suggests a greater role of media-freedom may arrest the violations in execution of law and the associated corruption. The chapter focuses on the role of media-watch in

determination of the size of the network, the moral standard. It also analyses how media-watch and the compliance cost determine the extent of violation of law. Fourth, the chapter suggests the way policies can be designed in medium and low penalty bureaucracies for controlling its corruption by appropriate use of compliance cost, media-freedom, judicial efficiency against extortion cases and reapplication fees, which is new to the literature.

Chapter 5 concludes the thesis and proposes extension and addition on the topics discussed above.

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