

Gender and corruption: do women bribe less and why? Evidence from global survey data

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Abstract

Objectives of the study

The objective of the thesis is to investigate the link between gender and corruption. Increasing gender equality has been proposed to help reduce levels of corruption societies, as women are sometimes seen as less prone to corrupt behavior than men are. An important question is, whether women universally show less corrupt behavior than men. Furthermore, understanding of the possible explanations for any gender differences and their plausibility are essential to understand whether increasing the share of women in public life could have the desired effect of limiting levels of corruption.

Methodology

The study consists of a literature review and an empirical analysis utilizing micro-level survey data from 107 different countries. Academic literature on gender and corruption is analyzed to understand what findings have already been made; what is the relationship between gender and corruption outcomes and what kinds of theories have been proposed to explain the findings. The relationship between gender and self-reported bribery and other factors related to corruption are analyzed using a binomial probit method.

Results

The main findings are that women appear as less likely to engage in self-reported bribery and the most likely reason behind this is a difference in the way public officials treat women and men. Gender discrimination may be an important mediating factor in this. Gender differences in risk aversion as a factor to explain gender differences in bribery does not receive support from the analysis. Neither is there any evidence to suggest that there would be any difference between men and women in propensity to engage in bribery if equal treatment of the genders was given. Considering the findings, a universal policy rule promoting gender equality as an instrument to fight corruption seems ill-advised.

Keywords corruption, gender, governance, development economics

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The results presented in this paper rely on data from the TI Global Corruption Barometer 2013 provided by Transparency International.

1 Introduction

Discussion on the relationship between gender and corruption has gone on for years. Many argue that women tend to behave less corrupt than men and there have been proposals to increase women's share in public life in developing countries as a possible 'cure for corruption' (Goetz, 2007). Academic research has found out that women often appear as engaging in corruption less often than men and that there indeed are correlations between higher gender equality and lower corruption levels in societies. However, the topic still lacks research as indicated in many reviews siding the topic (e.g. Boehm, 2015)

It remains a question of interest, whether women actually universally tend to engage in corruption less than men do. Also the mechanism behind this gender difference is unclear, although several explanations have been proposed. I find it worthwhile to examine these questions with the help of data. Transparency International gathers the Global Corruption Barometer (GCB) with household surveys conducted in 107 countries worldwide for the last round in 2013 and this data has not been previously used to approach the gender-corruption debate.

My main results, based on a literature review of previous research and a statistical analysis of the GCB 2013 data confirm that women are less likely to engage in bribery. The mechanism that is most supported by the data to explain this finding is that women are treated differently from men by public officials, which leads to less frequent corrupt transactions when women are involved. There is few evidence to back a hypothesis that women would behave any less corrupt than men, given similar treatment.

Therefore, promoting gender equality as an instrument to fight corruption seems ill-advised as a universal policy rule. This naturally does not mean that promoting gender equality could not be advisable for other reasons.

1.1 Background and motivation

Corruption is widely agreed to be a hindrance to sustainable economic growth (Aidt, 2009). Although the question is also of inherent interest, the gender aspect to corruption research initially emerged as

academics and policymakers were interested in the possibility of increasing the share of women in public life to decrease levels of corruption. This was motivated by findings that women often appeared to behave more public-spirited than men did (Goetz, 2007). A discussion of gender differences in corruption and the possibility that women might be less corrupt than men took off in the change of the millennium with the publication of two influential articles *Are women really the 'fairer' sex? Corruption and women in government* (Dollar et al 2000) and *Gender and Corruption* (Swamy et al 2001). Both the articles conclude that there is a robust relationship between female participation in societies and lower levels of corruption. Yet as subsequent criticism points out, the causality is unclear. Since then, a sizable literature has emerged with researchers approaching the question from different perspectives.

Researchers have yet to reach a widely agreed-upon consensus on whether promoting women's position in societies could help in fighting corruption. However, several development agencies have instated policies based on the existing research stock. A strong relationship has sometimes been asserted between relatively high levels of female involvement in public life and low levels of corruption in governments (World Bank, 2001; Goetz, 2007; Sung, 2012; Council of Europe, 2014). Perhaps the most influential use of the hypothesis has been in the widely debated World Bank policy statement on gender equality, *Engendering Development* report. Although it is often concluded that promoting gender equality is not harmful even when done for questionable reasons (Treisman, 2007, Boehm, 2015), it is important at least from an intellectual honesty point of view that we strive to acquire the best possible knowledge on the issue. Inadequately informed beliefs of 'inherent qualities' of women may also backfire unexpectedly on efforts to promote true gender equality.

The literature on the gender-corruption relationship is still constantly expanding (see e.g. Breen et al, 2015; Boehm, 2015; Debski & Jetter, 2015) after fifteen years of debate and a myriad of research. A recently emerged hypothesis is that institutional and cultural context should play a major mediating role in the formation of the relationship (Esarey & Chirillo, 2013; Breen et al, 2015), but research focusing on the hypothesis is scarce to date. Seen how experimental evidence varies significantly according to the location of experiments (Chaudhuri, 2012), the role of institutions deserves more examination.

As with most of the questions related to corruption, there are two critical obstacles to exact research. On the one hand there has been the difficulty to define what counts as corruption. No single uncontested measure exists to capture the absolute level of corruption in any given setting. On the

other hand, measuring any given proxy to the level of corruption is challenging. As corruption by definition involves clandestine acts, it is challenging to elicit truthful data from economic actors on their performance regarding corruption. Therefore, much of earlier empirical research has relied upon surveys third-party perceptions of aggregate corruption levels in entire countries, such as the Transparency International Corruption Perceptions Index.

Measuring corruption by perceptions has been justifiably criticized (Reinikka & Svensson, 2006; Donchev & Ujhelyi, 2014) for potential biases and in the last decade better data based on actual experiences of households and businesses have been collected in several surveys such as the World Bank Enterprise Surveys and Transparency International Global Corruption Barometer. As relatively reliable experience-based data has not existed for a long time, empirical research utilizing the new data sources is still rather scarce. Therefore, it is highly interesting to apply one of these new-fangled datasets to the gender-corruption question, especially as this type of corruption data is often considered an improvement in reliability and accuracy over third-party perceptions (Reinikka & Svensson, 2006; Treisman, 2007). Micro-level data also data lets us examine patterns in behaviour of individual actors over a large sample, which can be compared with the results from surveys of expert opinions and small-scale experiments.

Furthermore, a large part of the existing research concentrates on corruption in the higher echelons of societies and business with the low-level corruption in household context relatively less researched. Therefore, I choose to utilise the Global Corruption Barometer survey collected by Transparency International, which surveys households in 107 countries worldwide for their experiences in corruption. Doing so I can reveal some novel information on the connection between gender and corruption in ordinary citizens' dealings with public officials.

I contribute to past empirical and experimental studies, shedding new light on the findings made on the gender-corruption connection to date. A major shortcoming of my work is that I cannot establish a causal mechanism based on the data. However, based on the observed patterns and theoretical framing, I can make educated evaluations on the possible factors and mechanisms driving the results.

1.2 Research question and methodology

The research question of this study consists of two parts. First, I want to establish an answer to the question ‘*Are women universally less likely to engage in bribery?*’ The second step is to ask ‘*What are likely causal mechanisms behind gender differences in bribery?*’ As opposed to the wider phenomenon of corruption, I focus on bribery in the research questions due to data availability.

The study consists of a review of existing literature and an empirical analysis designed on the basis of earlier findings. The empirical analysis is based on experience-based survey data from 113 270 households living across 107 countries over five continents, collected by Transparency International for the Global Corruption Barometer (GCB) 2013 round. I come up with five hypotheses that I test utilizing four binary dependent variables drawn from four different survey questions of the GCB 2013. I apply a binomial probit model to estimate the effect of gender and other relevant independent variables on the dependent variables. Additionally, I run OLS regressions with identical specifications as a robustness check.

1.3 Structure of the thesis

Chapters two to four make up the literature review. I begin in chapter 2 with general definitions of concepts, theoretical considerations and some background information on the determinants and effects of corruption. Chapter 3 concentrates on what previous research has uncovered of the relationship between gender and corruption. Chapter 4 then ends the literature review with a review of the theories proposed in previous literature to explain the gender differences in corruption.

Chapters 5 and 6 make up the empirical study. In chapter 5, I introduce the data, define hypotheses and construct variables from the data. Analysis and discussion of the results I present in Chapter 6, finally ending in short conclusions in chapter 7.

2. Corruption and its Measurement

In this chapter, I first discuss some central definitions and establish the position of my study within the literature on corruption. Further, I consider the shortcomings in measuring corruption and the limitations those set for empirical research on the theme. The rest of the chapter consists of a review in research of consequences and determinants of corruption apart from gender.

The key points of the chapter lie in positioning my study and providing essential background information on what the common understanding is on corruption. My study fits in the niche of bureaucratic corruption in a household context with the results partly generalizable to corruption in general. The choice of experience-based survey data as the basis for analysis is informed by literature in measurement of corruption. Corruption is usually found harmful for societies, but especially for the individual it is sometimes the best solution to manage dealings with the public sector and in some cases it may be beneficial for a society in the short term (Aidt, 2009). Several personal characteristics of individuals emerge as potential correlates of corrupt outcomes. I will apply this information in the choice of control variables.

2.1. Central definitions

Research on corruption applies a wide range of interrelated concepts and sub-concepts, the difference between which needs to be carefully defined and understood to make sense of the larger image. Therefore I shortly define some of the central ideas and identify which of them I am focusing on in this work.

Corruption may have different meanings to different people and under different contexts. A concept I use in this study is ‘public corruption’ (e.g. Pardo, 2004). Public corruption again can be defined narrowly as ‘sale of government property for private gain’ (Aidt, 2009) – or more broadly as ‘misuse of public office for private gain’ (Svensson, 2005), which in addition to the sale of government property captures for example kickbacks in public procurement, bribery and embezzlement of government funds. The most important function of corrupt acts can be concluded as that they aim at private gain acquired by abuse of position in an organization. It is also worth noting that the private gain needs not be monetary, the currency exchanged may be in-kind, such as sexual favors (Goetz, 2007), which are not captured when measuring monetary transfers.

An important acknowledgement when defining corruption is that the boundaries of what is understood as corruption may shift over cultures. An act considered corruption somewhere may elsewhere be an accepted customary practice, such as families bringing gifts to teachers of their children. Similarly, in many countries, when applying for a passport, one can legally receive expedited service with additional payments, while in other countries similar payments may be customarily unofficial. Thus, we need to consider local rules and customs when understanding the definition of corruption and how it is viewed in a certain context (Banerjee et al, 2012).

Bribery, embezzlement, clientelism, nepotism, and vote-buying are different manifestations of the corruption (Serra & Wantchekon, 2012)., *Bribery*, defined as unauthorized transfer of money or an in-kind substitute, is the form of corruption that most empirical studies measure to proxy for corruption (Banerjee, 2012). Out of the different forms of corruption, *bribery* is a crude, but explicit and concrete form of action. This makes bribery relatively easy to quantify and measure relatively reliably, leading to most global data collection attempts focus on it. For this reason, I follow the trodden path also in my study, focusing on the varying propensities to engage in bribery.

In addition to the format, an important distinction between subconcepts of public corruption should be made between *high-level* and *low-level* corruption. *Grand corruption*, used for the high-level corruption refers to activities of politicians or bureaucrats with influence over large projects and important contracts (Søreide, 2006). High-level political networks and major stakes make grand corruption not only highly complex, but also challenging to measure, due to which there is no detailed data available for this type of corruption.

The focus of my study lies in the other end of the scale at the transactions between low-level bureaucrats and ordinary citizens, which the GCB 2013 data covers. Terms used to describe activities in the low-level *petty* or *bureaucratic* corruption. When petty corruption takes place, small, even routinely payments are transferred between persons on lower level of institutions and e.g. households or business executives (Søreide, 2006). In bureaucratic corruption, as opposed to grand corruption, where bribery often takes place in order for the briber to receive a special treatment, in bureaucratic corruption the bribe often acts as an insurance against adverse shocks (e.g. in a hospital to receive a treatment timely) (Justesen & Bjørnskov, 2014).

Another distinction worth acknowledging, but not necessary to discuss further in the scope of my study is that between households and business. On the low bureaucratic level in focus in this study there is no essential difference between households and businesses concerning the incentives to act corrupt or the consequences of corruption. Furthermore, as Chatterjee and Ray (2012) find, countries that face higher levels of individual corruption also tend to face higher levels of business corruption, proving the close linkage between these two types of corruption.

Lastly, the payers of bribes in low-level bureaucratic corruption are sometimes referred to as ‘victims’ of corruption (see e.g. Justesen & Bjørnskov, 2014), as opposed to treating them as totally independent actors knowingly and willingly committing a potential crime. However, for the scope and focus of this study the distinction between victims and beneficiaries is not necessary, as bribe payments are always against the accepted moral code and fulfill the definition of corruption.

2.2 Measurement of corruption

As discussed before, corruption is an abstract concept can take many different forms, which implies limitations to its measurement. In this part, I discuss these limitations and different attempts to overcome them. After analyzing the arguments for and against the different available interfaces to reality of corruption, I conclude that survey data covering experiences of corruption is the most suitable measure for the scope and purpose of my study.

Finding exact and unambiguous measures measuring the level of the entire phenomenon of corruption is not possible. Research focusing on corruption often proxies the underlying phenomenon of corruption with bribery, the most explicit form of the phenomenon. Bribery is also the focus area in this study. Explicit bribery can also be measured somewhat accurately by surveys of actual corruption experiences or experiments. Other widely used measures that try to capture either bribery or corruption in general include surveys of personal values and third-party perceptions of corruption. Personal values stated in surveys, however, do not necessarily reflect actual behavior and third-party perceptions are prone to subjective biases.

Interpretation of different proxies of levels of corruption and bribery requires remarkable attention as none of the proxies necessarily captures the entire underlying phenomenon. This is proven by

significant differences found between the two types of measures most used in research; perception and experience surveys. These two types of measurements have produce mixed and in some cases even contradictory signals (Treisman, 2007; Razafindrakoto & Roubaud, 2010; Donchev & Ujhelyi, 2014). There is some evidence that expert surveys tend to overestimate the amount of bureaucratic corruption faced by households when compared with household experience survey (Razafindrakoto & Roubaud, 2010). The correlation between corruption experiences and perceptions may not be very high even when a single sample of respondents are asked for both perceptions and experiences (Weber Abramo, 2008). These findings suggest that there are problems like subjective biases in forming of perceptions or that experience surveys do not capture truthful answers. Possibly the subjective and objective indices may also be explained by different factors (Svensson, 2005).

Aggregate indicators that combine different measures of perceptions and experiences, such as the Transparency International Corruption Perception Index and the World Bank Control of Corruption Index exist and have seen widespread use in literature. They, however, intend to come to a single measure to estimate the level of corruption in a country and therefore lack a significant degree of detail important for understanding effects of personal traits linked with corrupt behavior. Also, the aggregate indices consist largely of subjective estimates by experts, which are likely to suffer from perception bias (Treisman, 2007). Furthermore, the widely used indices are likely to suffer from problems with the causal relationships as some of their components are highly intercorrelated (Reinikka & Svensson, 2006), (Knack, 2007). Also, ideological biases arising from the background of the sources of the evaluations cannot be ruled out (Razafindrakoto & Roubaud, 2010).

As another approach to cope with the problems of subjective perceptions, several surveys seeking to obtain data based on actual experiences of corruptions. Some of the most prominent surveys questioning households or businesses include the Transparency International Global Corruption Barometer used in this study, World Bank Enterprise Surveys and UNICRI International Crime Victimization Survey ICVS. Significantly, also these surveys vary in how they approach acquiring the information on corruption experiences, each with unique problems to each measure. Questions that have been used include e.g. whether respondents have simply been asked for bribes, or if they have actually been involved in a corrupt transaction.

The data obtained from surveys, no matter how well designed, is also not exempt of biases and inaccuracies. As corruption by nature involves clandestine acts, the major weakness of the surveys inquiring for experiences of corruption is that individuals are not necessarily willing to reveal details

of any corrupt behavior. Respondent reticence is recognized as a problem especially with the most sensitive questions such as asking for personal involvement¹ in corruption (Tourangeau & Yan, 2007).

The common strategies of respondents to protect themselves against potential detection and punishment are nonresponse and false response (Gutmann, Padovano & Voigt, 2015). Respondent reticence can increase further in politically repressive environments², leading to potential understatement of corruption in countries with such environments (Jensen, Li & Rahman, 2010). The latter is especially harmful for cross-country comparisons.

There are several methods proposed to minimize respondent reticence. One tactic is not to include questions incriminating the respondent directly, such as whether the respondent has been asked for bribes by officials. However, relatively accurate knowledge on the frequency of bureaucrats explicitly asking for bribes may not reveal the frequency of actual corrupt transactions taking place. A strategy often proposed to minimize reticence when eliciting information on corrupt dealings is to distance the respondent from the question while trying to ensure that the response reflects the true experience of the respondent as accurately as possible³ (Reinikka & Svensson, 2003; Clausen, Kraay & Murrell, 2010). Also the GCB 2013 data that I base the empirical analysis on, includes a direct question asking for respondents' involvement in corruption. The survey has been designed without a direct reference to the respondent in this particular question.

Some surveys also ask respondents to specify amounts of bribes they have paid. Significant discrepancies are easily created there; results may differ significantly depending on for example whether the amount of bribes is asked to be specified in absolute monetary terms or as a percentage of sales (Clarke, 2010). This shortcoming of some surveys is not directly relevant to my empirical study, but is important to acknowledge for comparison with results from other studies that have used data for example from the World Bank Enterprise Survey.

In addition to surveys on attitudes, perceptions and experiences of corruption, a widely used approach to examine corruption is through experiments. Existing experimental research in corruption has taken

¹ Or in the case of a business, involvement of the organisation

² Data on businesses

³ Instead of directly referring to the respondent, the survey question can refer to 'people like you' or 'you or anyone else in your household' (the form used in the GCB 2013 survey)

place both in lab and on field. The experimental approach has an advantage of mitigating the measurement and endogeneity problems present in research based on perception indices and experience surveys. One of the strongest point of experimental studies in corruption research is in increasing understanding of both how corruption occurs and how potentially corrupt individuals respond to different sets of monetary and nonmonetary incentives (Serra & Wantchekon, 2012). However, it is unclear to what extent results obtained in laboratory experiments will be externally valid (Armantier & Boly, 2012). Therefore, experimental studies may be useful in studying the mechanisms of corruption, but as standalone sources of information they are not useful to research describing the actual prevalence of corruption and its dynamics across countries.

In addition to the mentioned methods to capture corruption, some novel and potentially less biased measures have spawned in the literature. For example, bribery has been systematically measured by using micro-level data on reported earnings, household spending and asset holdings where this kind of data is available⁴ (Gorodnichenko & Sabirianova Peter, 2007). This approach, however requires access to a large amount of potentially proprietary data and therefore is not easily applicable for measures spanning over several countries. Another innovative take on the issue has been comparing the amounts of unpaid parking tickets from diplomatic staff of different countries in Manhattan, New York as a proxy for differences in levels of corruption in the respective countries (Fisman & Miguel, 2007). Although probably less biased, the parking ticket measure is likely subject to substantial error and includes few detail.

Considering the benefits and shortcomings of the existing indicators, combination of different types of indicators is probably necessary to achieve a comprehensive understanding of what we know about the prevalence of corruption. In my study, I choose to utilize a household survey on corruption experiences⁵. As discussed also above, survey datasets on experiences are a relatively new development in corruption research and to date have not seen as extensive use as for example some of the aggregate indicators. Furthermore, the micro data sets allow for a sufficient level of detail to examine the individual's characteristics in explaining their experiences and behaviors (Chatterjee and Ray 2012).

⁴ A single study using data from a single country (Ukraine)

⁵ Global Corruption Barometer dataset collected by the Transparency International

2.3 Consequences of corruption on the level of society and individuals

Nowadays corruption is widely recognized as a major economic hindrance, as it is linked to many other economic problems. However, another point of view is that corruption might grease the wheels of societies through providing ways to circumvent suppressive regulation – which might hold true for certain trivial cases. Nevertheless, on the general level, corruption, quoted as the ‘Public Enemy Number One’ (World Bank, 2013) is seen as one of the most pressing hindrances to progress especially in developing countries.

Numerous studies have linked corruption with other phenomena that act as direct obstacles to economic development. Inter alia, these phenomena include reduced investment (Lambsdorff, 2003; Mauro, 1995; Wei, 2000), diversion of public resources (Mauro, 1998; Olken, 2006) and increased business costs (Ades & Di Tella, 1997; Kaufmann, 1997; Shleifer & Vishny, 1993). Corruption may not have a direct effect on the GDP or economic growth rate of a society in the short run, but indeed seems to have a negative effect on sustainability of economic development (Aidt, 2009). Furthermore, there is a clear interlinkage and measures to promote good governance may promote growth and vice versa (Holmberg, Rothstein & Nasiritousi, 2009).

Apart from mere economic growth, there is evidence that the diversion of public resources caused by high and rising corruption may increase income inequality and poverty (Gupta, Davoodi & Alonso-Terme, 2002). Other consequences found to have links with corruption and decreasing the quality of life in societies include inflation, increased crime, policy distortions and lack of competition (Lambsdorff J. G., 2005).

Nevertheless, there is an ongoing debate of how much corruption may benefit societies through a proposed role in countering harmful regulation (Leff, 1964). Indeed, corrupt practices may for example facilitate firm entry in some highly regulated economies (Dreher & Gassebner, 2011). However, although corruption may help compensate bad governance, negative impacts of corruption to investment and growth tend to worsen when indicators of quality of governance deteriorate (Meon & Sekkat, 2005). However, neither in the real world is complete absence of corruption optimal, as fighting corruption requires resources (Acemoglu & Verdier, 2000).

Although corruption is harmful to societies in general, it is important to note that on the micro-level in certain types of environments, individual citizens or individual businesses may perceive corrupt

acts as a 'necessary greasing the wheels' to handle their dealings with the public sector. When the structures of a society set incentives to act corrupt, corruption may be generally seen as an at least quasi-legitimate to handle business, reducing moral costs and risks (Breen, Gillanders, McNulty & Suzuki, 2015). This again has implications to analyzing the behavior of individual citizens. For example, if a group of people were to show higher morals over other groups, it has to be reflected with what is considered moral behavior in the context in question.

The effect of corruption on citizens and businesses can be seen as a sister activity to taxation. However, due to the illegality of corruption and the need of secrecy, it is much more distortionary and costly (Shleifer & Vishny, 1993). It is primary the direct effect similar to taxes, which is found to lead to many of negative effects discussed before, e.g. reducing investment. However, as corruption is usually not based on any highly formal institution, the effect is not borne equally by all citizens (Wei S.-J. , 1997). This is likely to be among causes for the observation that more corrupt societies tend to be less equal (Gupta, Davoodi & Alonso-Terme, 2002).

Not only individual citizens, but also individual businesses face differences in the corruption they face and are engaged in. Using enterprise survey data from Uganda, Svensson (2003) finds that there is considerable variation in bribe payments across seemingly similar firms. Therefore it is likely that the position of these companies varies over their ability to pay or bargain, i.e. refuse a bribe, potentially distorting fair competition. (Fan, Lin & Treisman, 2009) find that for businesses at least the size of the company and share of state ownership to some extent determine the frequency of bribery firms face to some extent. Large and state-owned companies are likely better equipped to face corruption and have better networks.

2.4 Individual characteristics and corruption

The focus of this study is in the connection between gender and corruption. Understanding the connection between other individual characteristics and the probability of individuals to encounter and get involved with corruption is essential to recognize, whether there might be other individual-linked variables driving the results of my analysis. I will review past research in personal characteristics and corruption to develop this understanding and to be able to make informed decisions on the choice of relevant control variables.

The existing literature on general determinants of corruption at the level of an individual citizen or business is sparse compared to the work on cross-country measures. This is natural as eligible micro level measures relevant to corruption with a good coverage have been scarce until recently. Most of the literature has emerged in the previous ten years (e.g. Dong & Torgler, 2009; Dong et al., 2012; Guerrero & Rodríguez-Oreggia, 2008; Lee & Guven, 2013; Mocan, 2008; Svensson, 2003; Swamy et al., 2001; Torgler & Valev, 2006; Torgler & Valev, 2010). Sources of data have included the cross-country ICVS survey (MOCAN) and a multitude of other regional or local.

Age can be an important factor determining, whether individual citizens are prompted for bribes by officials. Lesser propensity to be asked for bribes has been found to be linked with both relatively young and old ages, which may result from young citizens not yet participating in society to the full, whereas older individuals again gradually shift out of the public life. This naturally leaves the people in their most active years to be asked for bribes more often than the other age groups (Seligson, 2006; Mocan, 2008). However, age may also affect personal values and personal justification of corruption has been found to decrease with age, robust for cohort effects (Torgler & Valev, 2006).

Income is another factor that has some predicting power over how often a citizen is asked for bribes. It is somewhat natural that the citizens with the highest ability to pay are also asked for bribes most often (Mocan, 2008⁶; Seligson, 2006⁷). However, at least in some contexts there is evidence that after a certain threshold income, the frequency of actual corrupt transactions decreases, which may result from wealthier individuals being able to opt out of the corrupt public services and receive similar services from elsewhere (Justesen & Bjørnskov, 2014)⁸.

There are also links between the level of education of the individual and the frequency of encountering corrupt officials asking for bribes. There is empirical evidence of a tendency that officials ask individuals with a higher level of education more often than those with a lower amount of schooling (Mocan, 2008). Although better educated individuals may be asked for bribes more often than the less educated, they have been found to be less accepting of corruption in some contexts (Truex, 2010⁹)

⁶ Mocan (2008) utilises the UNICRI ICVS dataset with data from 49 countries

⁷ Latin American data from several surveys of population

⁸ Justesen and Bjørnskov (2014) draw their data from the Afrobarometer

⁹ Data from Nepal street surveys

Living in cities, as opposed to living in rural areas has also emerged as a variable with some predicting power in some studies of both how often bribes are asked for and how often they are paid. This can result from the fact that there is usually a higher concentration of public sector services and also economic activity overall can be larger and more varied in scope in city like environments. A natural consequence of these is a higher likelihood to encounter corruption. Furthermore, contacts between public officials and citizens may be less personal in larger cities, whereas in rural areas potentially closer connections allow for other forms of corruption to overshadow crude bribery (Mocan, 2008; Justesen & Bjørnskov, 2014).

Religiosity can also play a role in the relationship between an individual and corruption, but this has not been studied extensively. In on field experiment, however, more religious people were less likely to accept a bribe when one was offered (Armantier & Boly, 2011¹⁰). However, this is likely to be highly dependent on the religion practiced and the relationship between religion and its context in society.

Importantly, the effect of the individual characteristics of citizens may vary over different environments and differences can emerge even within relatively homogenous geographical areas (Seligson, 2006). This finding fosters an assumption that gender among other individual characteristics may not relate to corrupt behavior in a similar way in every context.

A significant problem in most of the studies is that they do not include information of the likelihood of respondents to have had contact with public officials in the first place. Therefore, not too much emphasis can be put on the results reviewed in this chapter. However, the results inform me in the inclusion of control variables in the empirical analysis of my data.

2.5 In which societies do we seem find corruption and who are considered corrupt?

In the previous I summarized findings on individual characteristics and their relation to individual citizens encountering or committing corrupt acts. In the following I review shortly the qualities of societies, which are correlated with higher levels of corruption.

¹⁰ Field experiment in Burkina Faso, Africa

As discussed before, GDP levels and corruption correlate strongly with each other on a country level. The causal mechanism, however, is not necessarily clear and it is likely that the factors are interlinked (Holmberg;Rothstein;& Nasiritousi, 2009). GDP is not the only variable repeatedly found robustly related to corruption. Inter alia, corruption is lower in richer countries, where democratic institutions have been preserved for a long continuous period, and the population is mainly protestant. Corruption is again higher in countries where political instability is a major problem. Colonial heritage is also found as a significant determinant of corruption, the effect of which is determined by the quality of institutions founded by the colonialist country (Serra, 2005).

Institutions matter in many ways. For example, countries with institutions favorable to competition have been found less corrupt, whereas Corruption is higher in countries where domestic firms are sheltered from foreign competition by natural or policy induced barriers to trade, with economies dominated by a few number of firms, or where antitrust regulations are not effective in preventing anticompetitive practices (Ades & Di Tella, 1999). The effect of democracy may be activated only in countries with a sufficient income level. (Jetter;Montoya Agudelo;& Ramirez Hassan, 2015)

Treisman (2007) provides an extensive survey of the country-level determinants of both country-level corruption perceptions and experiences. Business people and citizens perceive states less corrupt when the states are highly developed, long-established liberal democracies, with a free and widely read press, a high share of women in government and a long record of openness to international trade. Countries with higher perceptions of corruption again are more likely to be dependent on fuel exports, have intrusive business regulations and suffer from unpredictable inflation. (Treisman, 2007)

However, when it comes to experiences of corruption, Treisman (2007) finds that out of the factors found to reduce perception of corruption, definitely economic development does also reduce frequency for demands of bribes. He also finds that greater openness to imports may be to a minor extent associated with a lower reported frequency of bribery in business. Also more intrusive business regulation may according to Treisman (2007) lead to greater reported corruption, but that the size and robustness of the effect were less clear.

It is clear that factors on the macro level such as institutional environment matter for corruption. The country-level factors are not, however, in the focus of this study, but are of interest rather as a mediator to the effects of personal factors. I will include the country-level factors in the empirical

analysis in the form of country fixed effects. Regarding the effect of institutions, it is important to note that a strong democracy is found to be associated with fewer corruption.

2.6 Theoretical framework

Following Becker's original framework (Becker, 1968), the main determinant of an individual's behavior regarding corruption or other criminal acts is the expected utility of the individual for committing the act in question. Therefore, the probability of an individual to commit corruption is dictated by the chances of being caught, the gain from the corrupt activity and the individual's personal characteristics such as moral values. This yields in the first stage a model of the probability p for an individual i to be involved in a corrupt act as follows:

$$p_i = \beta' X_i + v_i$$

Where β represents a vector of coefficients, vector X denotes factors and v denotes an unobserved error term.

The types of characteristics that affect an individual's propensity to engage in corrupt acts can also be further deconstructed to subsets. Relevant for the work at hand is e.g. a set that relates to an individual's incentives related to corruption. Following to the framework by Becker (1968), individuals evaluate their utility function costs and benefits derived from the corrupt act. Individuals consider the monetary and non-monetary profits, comparing them against the probability of detection and punishment, opportunity costs and moral costs to the act, which to a large extent vary by individual and between individuals (Guerrero & Rodriguez-Oreggia, 2008). Also, an individual's indoctrination in relation to norms (R.E., 1988) and the degree of risk aversion an individual shows (Cadot, 1987) bear an effect on the outcome.

Another set of characteristics that needs consideration is the social context. Theoretically, corruption may produce a vicious circle, where individuals see themselves partially forced to commit such acts, affecting the implicit system of values in a society and making the individual act corruptly based on rewards and incentives (Andvig & Moene, 1990). Also the factors related to the individual citizen must be viewed relative to the existing norms of the society, making these two sets partially

inseparable. However, for clarity and understanding, separating the country and individual specific factors yields the following model

$$p_{i_j} = \beta_1' Y_i \beta_2' C_j + v_i + u_j$$

where p is the probability of committing a corrupt act, i denotes the individual, j the the country, β_1 a vector of coefficients, Y a vector of factors related to the individual citizen, β_2 a vector of coefficients, C a vector of factors related to the country and where v and u represent the respective error terms.

Furthermore, the characteristics of situations where bribery occurs include the symmetry of information. As corruption takes place between two or more actors, information plays an important facilitating role in the transaction and information asymmetries are found to reduce the probability of a transaction being corrupt (Ryvkin & Serra, 2011). Therefore, a complete model of corruption should include the party of the 'bureaucrat', in addition to the 'client'. However, regarding this work, constructing such a model is beyond the scope and purpose. Nevertheless, it is important to understand the existence of these factors to fully understand the empirical analysis provided further.

3. Gender and corruption: what the previous research has to say

The aim of this chapter is to summarize the findings made in earlier research on gender factors and corruption, both on the level of societies and individual economic actors. First I review findings on the aggregate or country level, then micro-level findings based mostly on survey data. Third, there is a relatively vast literature based on experimental studies that reveal some gendered aspects of corruption. Lastly I discuss some recent findings on how the gender effect changes over different institutional environments. In the next chapter I then move on to provide an overview of the theoretical explanations proposed for the findings.

The leading finding from previous research on the country level is that, indeed, in countries where gender equality is higher and women have a larger share of positions in the public sphere, corruption levels appear lower. However, it is not straightforward to insulate the effect of gender in these cases as societies with higher gender equality usually tend to perform on other indicators in a way that is similarly linked with lower corruption levels. Therefore, there has been serious critique on the possibility that the findings are based on spurious correlations.

The micro level studies are rather consistent in revealing a difference between the genders in how often citizens or business managers are asked for bribes, with women ending up involved with corruption less often than men. Regarding personal values, there is evidence that women in general may be less condoning of corruption. However, not all studies show this and it is possible that differences again emerge from differences in the ability to benefit from corruption on the part of those women that do not participate actively in society.

Based on the experimental studies that I have had the possibility to get acquainted with, it is impossible to arrive in any definitive conclusion concerning the gender-corruption connection. Some studies do find tendencies that suggest women might be less susceptible of corruption, whereas even more studies fail to find any significant gender difference. Therefore, experimental evidence casts some doubt over the hypothesis that there would exist a universal difference in the propensity to commit corrupt acts between the genders. More likely explanations would be that the gender difference in corruption is driven by differences in opportunities or; in case a gender effect exists, it is either produced or activated by certain environments.

3.1 Aggregate (country) level empirical studies

As Boehm (2015) notes, it is easy to spot the correlation between higher gender equality and lesser corruption by the common corruption indicators. The field of research in the link between gender and corruption more or less emerged from two pioneering studies (Dollar, Fisman & Gatti, 2001; Swamy, Knack, Lee & Azfar, 2001). The pioneering studies both employ indicators of the participation of women in national parliaments, governments and labor force as independent variables to explain variation in levels of corruption in respective countries.

Increasing the presence of women in national parliaments indeed seems to lead to a reduction in perceived corruption, when controlling for the respective changes in civil liberties, income and education (Dollar, Fisman & Gatti, 2001). Also, the presence of women in national parliaments together with the share of women in senior positions in public administration and the share of women in the labor force seem to jointly have similar explanatory power over lower levels of corruption in a country.

The pioneering studies took into account some possible sources of spurious correlation, such as civil liberties, levels of education and GDP. Some measures of liberal democracy have still been shown to render measures of gender equality insignificant in studies replicating the pioneering works (Sung, 2003; Sung, 2012). The validity of this critique has, however, rightly received critique for potentially depending on the inclusion of an indicator of rule of law as an explanatory variable in the analysis, (Treisman, 2007). Rule of law and corruption measures in the early studies are very closely related and therefore predicting one with another leads to an endogeneity problem. Nevertheless, the discussion suggests that liberal democratic institutions may be a common underlying cause to both lower corruption and higher gender equality.

Furthermore, there might be a reverse causality in action behind the observations of participation of women decreasing corruption levels. E.g. if lower corruption levels impose restrictions on male-dominated networks, this provides more opportunity for women to progress in their careers. (Frank, Lambsdorff & Boehm, 2011)

Studies reporting the robust correlation between gender equality and corruption also lack proof of a causal mechanism, where the underlying cause of lower corruption levels would be in the increased

presence of women in public life. Furthermore, the explanation provided that on the level of the individual, women can act less tolerant of corruption and therefore decrease the level of corruption in the society when their share increases, runs into ecological inference (Sung, 2003; Alhassan-Alolo, 2007; Goetz, 2007).

Furthermore, all the early studies seeking to establish a connection between gender and corruption on the macro level in societies proxy for corruption using subjective perception based measures, the limitations of which I have discussed already earlier. The use of the subjective measures leaves room also for the possibility that the experts giving their input to the surveys implicitly consider the proportion of women active in the societies and factors relevant to that as an input, potentially biasing the measures upon their conception.

3.3 Observations from micro level data

Studies with micro level data that have included gender as a variable have been mostly based on surveys that have inquired respondents on their experiences on corruption. Another source of data that has been used to draw conclusions on corruption are surveys on personal values of respondents. I review both types in the following.

Most of the studies based on surveyed corruption experiences find that women are less likely than men to be targeted with requests for bribes, but also to report payments of bribes. However, a repeated hypothesis to stand behind this is that it may arise solely from women having less contacts with public officials. The surveys on personal values show that women appear often less condoning of bribery than men. However, stated values do not necessarily translate into action and women on average may simply disagree with corruption, because they may not be in the position to benefit from it.

Drawing on the ICVS dataset by UNICRI with 55 000 households from 30 countries worldwide, women are targeted with attempts to elicit bribes less often than men (Mocan, 2008). A similar tendency has been confirmed on data from Latin America (Seligson, 2006) and Africa (Justesen & Bjørnskov, 2014). In a European context there are mixed findings with women either equally or less often asked for bribes as men (Lee & Guven, 2013). Further similar findings have been made in

business context with data from Georgia (Swamy et al 2001) and worldwide data (Breen et al, 2015), with women appearing as paying bribes less often than men.

The findings from data based on corruption experiences may have several different explanations. In addition to the possibility that women have morals higher than men, women might simply not have similar opportunities to engage in corrupt dealings due to discrimination. In the Georgian business context, for example, women can be less likely to belong to old boy networks sharing bribes or simply due to less collective experience from the labor force, women have not yet adapted to the corrupt practices as far as men have (Swamy et al, 2001). When exposure to public officials is not controlled for, it is also possible that women have less dealings with officials than men, therefore ending up involved with corruption similarly less often.

Surveys based on personal attitudes gathered worldwide has been found to show that women tend to view corruption in a more negative way than men (Swamy et al, 2001). However, there have been contradicting findings in European context with a general population survey (Lee & Guven, 2013); in India among bureaucrats in homogeneous positions (Vijayalakshmi, 2008) and in Nepal with data collected from people walking on streets (Truex, 2010).

An important notion is that for example in the survey utilizing Nepalese data, the responses were collected from people walking in the streets, thus more likely to be active members of the society (Truex, 2010). It is likely that an individual's social role and degree of participation in the public sphere decides the extent of that individual's exposure to corruption, which furthermore can cause differences in attitudes toward corruption. Also, if women in general or a subset of women is benefiting from corruption less than the general population their attitudes toward corruption may be harsher than the average view (Alatas, Cameron, Chaudhuri, Erkal and Gangandharan, 2009).

3.2 Experimental evidence

As mentioned above, the association of higher number of seats in parliaments held by women in a society and women's lower corruption or attitudes condemning corruption in surveys do not necessarily predict how these women will behave when actually placed in a situation involving corruption, especially when non-trivial amounts of money are involved (Alatas, Cameron, Chaudhuri

& Erkal, 2009). This shortcoming has partly been addressed with evidence from experiments both in lab and in the field. It is only through experiments that the corrupt acts can be broken into their sub-acts and different aspects can be explored, such as whether people are willing to engage in a corrupt act; are people willing to reciprocate when someone else offers a bribe or a gift (Chaudhuri, 2012). Experiments can be especially helpful in establishing causality, but external validity of experiments can be questionable. Therefore they can at best be used to test hypotheses in smaller samples.

I will shortly review the results found in some experiments with a focus on the gender aspects of corruption¹¹. There is significant variety in the settings in which these experiments have been conducted. The most important finding is that whereas there is often no gender difference associated to acts of bribery, whenever a difference arises, it tends to be that female behaviour favors corruption less than male (Chaudhuri, 2012).

A majority of experimental studies explore the role of women as bribees, whereas my empirical study concentrates nearly exclusively on women in the role of the briber. In some contexts, no differences between genders are found (Alatas et al, 2009; Waithima, 2011; Armantier & Boly, 2011). In some contexts, again, experimental evidence speaks for women offering bribes less often than men (Alatas et al, 2009; Rivas, 2013).

Alatas et al (2009) perform a set of experiments in four different locations¹², finding women to offer bribes less frequently in Melbourne, whereas they report no significant gender differences from New Delhi, Jakarta and Singapore. They find a similar pattern by location when testing whether there is a gender difference in propensity to accept a bribe: only in Melbourne are women reported with less frequently accepting bribes. In one other study conducted in Stuttgart, Germany (Schulze & Frank, 2003), a difference is found showing women less frequently accepting bribes. However, experimental evidence from other studies in Stuttgart, Germany (Björn & Schulze, 2000), in Ouagadougou, Burkina faso (Armantier & Boly, 2011) and Barcelona, Spain (Rivas, 2013) fail to find gender differences in acceptance of bribes.

Alatas et al (2009) observe the same geographical pattern a third time when testing for subjects' propensity to punish corrupt behavior. Australian women are, however, this time found to be less willing to punish for corrupt acts, when the punishment involves a cost. Waithima (2011) observes

¹¹ For example Chaudhuri (2012) provides a more detailed survey with methodological discussion

¹² Melbourne, New Delhi, Jakarta, Singapore

no significant gender differences in Kenyan context. When it comes to reciprocating a bribe, the evidence is again mixed. In experiments held in European contexts, women show a lesser propensity to reciprocate a bribe (Lambsdorff, 2011; Rivas, 2013). Armantier and Boly (2011) report that women seem to respond to monitoring and punishment by failing the briber more often, suggesting perhaps a greater sensitivity to risk among women.

Moreover, in an experiment on propensity to deceive another for personal gain, Dreber and Johannesson (2008) (again in a Western European context in Stockholm, Sweden), observe women deceiving others less often than men. However, in an experiment in Ethiopia, gender again is not shown to be related to risk of expropriation in a statistically significant way (Barr; Lindelow; & Serneels, 2009). Lastly, Rivas (2013) interestingly finds that both women and men tend to offer larger bribes to men than to women.

The evidence from empirical studies draws a picture, where any universal gender difference in readiness to act corrupt, provided the opportunity, is hard to see. Furthermore, even as some studies do report a gender differential, their relative number may be inflated by publication bias. Experimental studies without significant effects observed are not likely to get published. (Frank, Lambsdorff & Boehm, 2011).

3.4 Effect of context

Both the data from experiments and individual level surveys suggest that there are differences between women and men in the prevalence of corruption. Some empirical studies have lately emerged, proposing that gender differences in risk aversion might cause gender different in corruption under certain institutional settings.

Esarey and Chirillo (2013) explain corruption perceptions with the position of women, including a dimension of democracy added to the analysis. They execute their analysis on the country level, similar to e.g. Dollar et al (2001). With the explanatory variables being *female participation in government* and *institutionalised democracy*, they conclude that the relationship between gender and corruption does differ by institutional context so that in better established democracies the marginal effect of increasing the amount of women in government is higher than in more autocratic settings. The proposed explanation is that women are more averse to the risks of violating political norms and

because gender discrimination makes violating institutional norms a riskier position for women than men. (Esarey & Chirillo, 2013)

Breen et al (2015) analyse gender differences in the business context using the World Bank Enterprise Surveys data set. They use three different institutional or cultural variables to capture the effect of different settings: democracy, rule of law and religion. They find that in general, female managers and business owners are associated with less corruption in the business. Also on the micro level, they find support for the hypothesis that context matters. Women in business have a greater association with lower bribery in democracies. They run regressions also with corruption perceptions, finding that culture, however, has a stronger link with attitudes than with outcomes.

4. What might cause gender differences in corruption

The review of evidence from previous research in the previous chapter reveals that gender often observed together with differences in attitudes, behavior or with simply encounters of corruption. There is no conclusive evidence for the mechanism(s) behind these differences. In this chapter I review the popular potential explanations that have been given to explain the phenomenon. These explanations include (1) women either inherently or induced by prevailing cultures express higher integrity and moral standards than men; (2) women as a minority are relatively excluded from opportunities to engage in corruption; (3) by many studies women show a greater risk aversion than men, which may lead to the observed differences in corrupt behavior. I also include a discussion of the relationship between these potential explanations and different institutional environments.

4.1 Greater female integrity argument

Early on, studies proposed that women might be less likely to sacrifice the common good for personal (material) gain (Dollar et al, 2001, p. 424). I call this the *greater female integrity argument*. There is abundant research in fields such as psychology and criminology, indicating that women as a group could have higher standards of ethical behavior and be more concerned with the common good of a society, as opposed to their own immediate material well-being. As the aim of corruption is to obtain personal benefit by acting against the rules, the findings described could be applied to construct an argument that women tend to act corrupt less than men.

Many studies lending support to the greater female integrity argument have found that when compared to men, women would be more likely to obey rules or demonstrate higher levels of altruistic and communal behavior (Betz, O'Connell & Shepard, 1989; Beu, Buckley & Harvey, 2003; Buchan, Croson & Solnick, 2008). Inter alia, women can be more likely than men to exhibit 'helping' behavior (Eagly and Crowley, 1986) or be less deceptive than men (Dreber & Johannesson, 2008).

Even with the body of research pointing to women showing more altruistic behavior than men, the issue can be more complex than that. For example, the gender difference in altruism may depend on the price of altruistic behavior. Women have been found to behave more altruistic with a relatively high price for giving, while lowering the price of giving has led in men being the more altruistic gender. Women may care more about equalizing payoffs and therefore appear more altruistic in some

studies, but there is not necessarily any link that can be drawn to corrupt behavior. (Andreoni & Vesterlund, 2001)

Furthermore, women have found to vote based on social issues (Goertzel, 1983); score more highly on ‘integrity tests’ (Ones and Viswesvaran, 1998); take stronger stances on ethical behavior (Glover et al., 1997; Reiss and Mitra, 1998); and behave more generously when faced with economic decisions (Eckel and Grossman, 1998). Regarding corruption, however, all the findings provide circumstantial evidence at most.

The greater female integrity argument necessarily needs to be evaluated also in the context of the nature-nurture debate initiated by Kohlberg (1969), making a distinction between inherent, genetically determined traits and learned, socially constructed ones. For example, on one hand, women may feel more than men — the physically stronger sex, that laws exist to protect them and therefore be more willing to follow rules. On the other hand, girls may be brought up to have higher levels of self-control than boys which affects their propensity to indulge in criminal behavior (Gottfredson and Hirshi, 1990, p. 149). In case the hypothetical traits of greater integrity among women were inherent to the gender, the effects should be to some extent universal. There is no possibility to inquire further into this debate in the scope of this work. However, the distinction has to be acknowledged when discussing the possibility that increasing the numbers of women in influential positions could help fight corruption.

4.2 Women as a minority discriminated against and excluded from male networks

The gender differential in propensity to act corrupt may also be framed in terms of gender equality rather than in terms of essentialist arguments about greater female integrity (Goetz, 2007). This translates into an expectation that women may not appear any less corrupt than men if corrupt opportunities and networks are not restrained (Alhassan-Alolo, 2007).

An individual’s social role and degree of participation in the public sphere decides the extent of that individual’s exposure to corruption. When women and men differ in their social roles, one could also expect them to differ in their attitudes towards corruption. With a higher level of exposure to corruption in daily life might also come a higher tolerance and acceptance toward corruption, as is

sometimes observed for men. Women may be more condemning of corruption because they have less chances to benefit from it (Alatas;Cameron;Chaudhuri;& Erkal, 2009). In other words, gendered nature of access to public life shapes women's opportunities to be corrupt (Goetz, 2007). This is supported by some findings that show no gender difference related to corruption between men and women with similar access to society or positions (Vijayalakshmi, 2008; Truex, 2010).

In addition to simply fewer opportunities to act corrupt, a key factor may be the position of women as a minority in public life. Women might not afford to behave corrupt in societies where they represent a minority in public life and thus a vulnerable class. (Echazu, 2010). Women being a minority in public life may also affect the behavior of men that deal with women. In potentially corrupt transactions, individuals uncertain with respect to their opponent's intrinsic corruptibility are less likely to engage in corruption, i.e. longer social distance between different genders decreases the likelihood of corruption (Ryvkin & Serra, 2011).

If the exclusion of women from male networks and women as a minority being less in a position to engage bribery is a major mechanism causing the gender difference in corruption, the difference could be expected to diminish in contexts where there is less of discrimination against women.

4.3 Risk sensitivity

A third proposed mechanism to explain the gender difference in corruption lies in intrinsic differences between the genders in risk aversion. There is a sizable literature in support of the hypothesis that women would be on average¹³ more risk averse than men (Buchan,Croson;& Solnick, 2008; Jianakoplos & Bernasek, 1998; Croson & Gneezy, 2009), whereas risk preference has been found significantly related actual reported corruption outcomes (Lee & Guven, 2013). As a cautious remark, the differences in degrees of average risk aversion between men and women, although probably existing, may not necessarily be large enough to be relevant for real life consideration (Nelson, 2015). Thus the differences may not necessarily be significant enough to cause any measurable effect in corruption outcomes.

¹³ Croson & Gneezy (2009) suggest the effect to hold outside of managerial populations

There is, nevertheless some experimental evidence from research on transactions involving bribery that women may respond to monitoring and punishment by shirking the briber more often (Armantier & Boly, 2011). If women do react stronger than men when faced with increasing risk related to corruption, the sensitivity to risk may play an important role in forming the differences between the genders in individuals' propensities to engage in corruption.

Lately, differences in risk aversion have also been proposed to activate the gender difference in corruption in certain contexts (Esarey & Chirillo, 2013). In case of business, in the presence of business corruption, more risk averse firms are more likely to offer bribes (Søreide, 2009). Similarly, more risk averse individuals can be more likely to offer bribes in contexts where bribery is more prevalent and socially accepted – or where, according to the 'greasing the wheels' –hypothesis it can even be socially desirable to act corrupt. In turn, in societies where corruption is less prevalent and detection and punishment more likely, the more risk averse individuals could be expected to steer away from corrupt acts.

It has been argued that democratic institutions may be a factor activating the relationship between gender and corruption caused by risk aversion. This is due to corruption being stigmatized more in societies with strong democratic institutions (Esarey & Chirillo, 2013). Rule of law, related to both corruption and democratic institutions, can be another institutional dimension to act as a trigger for the gender difference. The risk of undertaking bribery under high rule of law is potentially greater with the risk of detection and punishment more likely (Breen, Gillanders, McNulty & Suzuki, 2015). Conversely, under predominantly autocratic institutions or low rule of law again it can be more risky to not act corrupt, therefore potentially closing the gap between men and women.

5. Basis for Empirical analysis

In the previous chapters I have laid the foundations for the empirical analysis. In this chapter I present the analysis. I start by describing the data, moving on to formulate hypotheses constructed based on the literature review and data available. After the hypotheses setting, I describe the dependent, explanatory and control variables after which I describe the model to be estimated. I present and analyse the results in the next chapter.

5.1 Description of data

The main source of data for this study is Transparency International (*Transparency International Global Corruption Barometer 2013*). This is the eighth round of a cross-country individual level survey conducted by Transparency International in co-operation with Gallup International. In addition I use data from OECD (*The OECD Development Centre's Social Institutions and Gender Index (SIGI)*) and the World Bank (*World Bank Worldwide Governance Indicators*).

I first present the data sources and discuss them more in depth with each of the variable used.

5.1.1. Transparency International Global Corruption Barometer (GCB)

My corruption data is from the Global Corruption Barometer, which is a public opinion survey based on primary sources and conducted by Transparency International. It provides a measure of people's experience of corruption through questioning individuals about their experiences with corruption. Previous studies have more frequently relied on other datasets such as the WBES, which may have certain advantages, such as that they distinguish between the frequency and the amount of bribes. However, I rely on the GCB as the data set is based on a representative sample of the population, whereas the WBES is confined to business people. Simultaneously, the GCB provides a relatively global coverage of countries, whereas the ICVS includes data only for 49 countries. The GCB data has seen previous use by e.g. Treisman (2007), Weber Abramo (2008) and Gutmann et al (2015).

Transparency International has surveyed more than 114 000 individuals; approximately 1 000 people from each of 107 countries for the Global Corruption Barometer 2013 round. The survey has been conducted between September 2012 and March 2013. In countries with a population of less than a

million, five hundred people have been surveyed. The survey sample in each country has been weighted by TI to be nationally representative where possible. In six countries, the sample has been of urban population only. The survey questionnaire has been translated into local languages and used for face to face, CATI (Computer Assisted Telephone Interviewing) or online interviews depending on the country context. Transparency International has used an independent analyst to verify and check the data in addition to its own staff and informs of possible reliability issues for certain countries in certain rounds of the survey.

Despite the GCB 2013 data being perhaps the best data available for a global comparative analysis, however, cases of misreporting are likely to remain in the sample. For this reason, I do not in this paper focus on the level or incidence of bribes per se, but rather on the correlates and directions of correlation.

The reticence problem, present especially in questions inquiring directly of clandestine acts by the respondents, is corrected to some extent in some questions of the GCB 13 data. In line with the indirect questioning technique proposed in literature on measurement of corruption (Reinikka & Svensson, 2003; Clausen et al, 2010), the question inquiring directly on the respondents' involvement in bribery is asked with only an indirect reference to the respondent¹⁴.

In addition, I apply another technique to mitigate the reticence problem. The questions include three possible answers, with 'Don't know' or 'No answer' in addition to 'Yes' and 'No'. To refrain from outright lies, respondents might refuse to answer some of the more intimidating questions. As proposed by e.g. Olken (2009), I performed tests using either answers 'Yes' or 'No' as the indicative response. However, this did not significantly affect any of my results.

Summary statistics of the countries and samples are included in Appendix 1. Summaries of all the variables are included in Appendix 2.

5.1.2. OECD Development Centre's Social Institutions and Gender Index (SIGI)

The second data source, the OECD Development Centre's Social Institutions and Gender Index (SIGI) is an measure of discriminatory social institutions with the initial revision published in 2009.

¹⁴ Question 7 is presented referring to 'in your contact or contacts have you or anyone living in your household'

The aim of the index is to seize the complex relationship between gender equality and discriminatory social norms through a multi-dimensional assessment. The SIGI index measures five dimensions of gender discrimination, from which an aggregate index is calculated. The indicators for SIGI's five dimension (subindices) include 1) *discriminatory family code*; 2) *restricted physical integrity*; 3) *son bias*; 4) *restricted resources and assets*; and 5) *restricted civil liberties*. The aim is to address the de jure and de facto situations of discriminatory social institutions across the five sub-indices.

The methodological framework for constructing the index takes into account *i) the legislative framework*; *ii) the de facto situation (customary laws and practices, implementation of laws, etc.) and practices through prevalence data*; and *iii) attitudinal data*. (OECD Development Centre, 2014)

I choose to use the 2014 edition of the SIGI because there is no data available for the exact year of 2013, when the majority of the data in use has been collected. The second round of the SIGI data has been collected in 2012 with a sample of 121 countries, whereas the 2014 edition offers data on 160 countries and therefore a far greater coverage. Exactly for use as a universal reference for discriminatory social norms, the 2014 revision sees the inclusion of all the OECD countries in the index (OECD Development Centre, 2014). Because of this question of data availability, I make the assumption that institutional change is sufficiently inert to not have a significant effect on my results, which are mainly based on data from 2013.

5.1.3. World Bank Rule of Law measure

Supplementary data to distinguish between societies by their level of rule of law is derived from the *World Bank Worldwide Governance Indicators* (World Bank, 2015). This dataset is used in various previous studies (see e.g. Sung (2003); Treisman (2007); Breen et al (2015)). The rule of law indicator captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. World Bank constructs this as a composite indicator, deriving the data from several different sources (World Bank, 2015).

5.1.4. Polity IV dataset

Supplementary data to distinguish between societies by their level of democratic institutions is derived from the Polity IV dataset. The Polity IV codes the authority characteristics of states in the world system for purposes of comparative, quantitative analysis and is currently the most widely used resource for studying the effects of regime authority (Marshall, 2014).

5.2 Hypotheses setting

I come up with five hypotheses based on the earlier research and the data I have available. The purpose of the first hypothesis (1) is to test, whether the finding that women engage in bribery less than men does hold true. The four following hypotheses (2-4) aim at testing the three different explanations that have been proposed in earlier literature for the difference in the propensity to bribe between men and women.

The first hypothesis aims to test, whether the phenomenon witnessed in some earlier studies that women tend to pay less bribes than men is visible in the data I use. I arrive at the following formulation:

Hypothesis 1. Women are significantly less likely than men are to report cases of bribery, when being exposed to contacts with officials equally to men.

The purpose of the second hypothesis is to test, whether differences between men and women in reported bribery might arise from differential treatment of the two genders on average. This yields the following:

Hypothesis 2. Women are significantly less likely than men are to report having been asked for bribes.

The third hypothesis is constructed to test, whether the behavior of women changes essentially when gender-based discrimination changes, yielding the following:

Hypothesis 3. A difference between men and women in the frequency of reported bribery and in reported requests for bribes grows when gender-based discrimination against women increases.

The fourth hypothesis is intended to test the proposed explanation that gender differences in risk aversion drive gender differences in corruption. As this should cause behavioral changes differently under different institutions, I arrive at the following formulation:

Hypothesis 4. Women report relatively fewer payments of bribes and more refusals to pay bribes in institutional contexts, where bribery is less condoned.

The last hypothesis is an attempt to capture possible essential differences in the propensity of different genders to behave public-mindedly to a different extent. When clearly facing a decision to bribe or not to bribe, groups of individuals demonstrating higher morals should on average be more likely to refuse paying. This yields the following:

Hypothesis 5. Women are significantly more likely than men to report having refused payments of bribes, all other things equal.

5.3. Variable definitions

Based on the hypotheses constructed, I construct four different dependent variables and two explanatory variables. To analyze the effect of institutional setting, there are further two variables that I use to split the data to conduct analysis on subsets thus constructed. In addition, there are six control variables. I describe all of the variables in the following.

5.3.1 Dependent variables

There are altogether four dependent variables, emerging naturally from the data. I consider the primary dependent variable, whether the respondents report a *bribe paid* in the previous 12 months. The data I draw from responses to a question, whether the respondent reports having paid bribes conditional to having had a contact with an official. Another dependent variable indicates, whether the respondent reports *contact with officials* in the past 12 months. As a third dependent variable I include whether the respondents report a *bribe requested* by officials in their lifetime. The fourth variable again indicates, conditional to having been asked for a bribe, whether the respondent reports *bribe payment refused* over the respondent's lifetime.

The survey design incorporates two sets of two questions that inquire the respondents about their dealings with public officials. They all originally include three answer options, ‘Yes’, ‘No’ and ‘Don’t know/No response’. I construct a binary dummy variable from each of the questions, indicating when the respondent has answered ‘yes’ to the question. I have performed a robustness check with constructing the variables indicating for the answers stating an explicit ‘no’¹⁵, but this does not change the results and I report only the results for the direct ‘Yes’ answers.

I describe the structure and construction of the dependent variables in more detail in the following.

Dependent variable 1. *Contact with officials*

The first dependent variable, indicating a contact with officials in the past 12 months is derived from the GCB survey question *Q7A: In the past 12 months, have you or anyone living in your household had a contact with the following institutions/organizations?* The organizations included in the survey are *Education system, Judicial system, Medical and health services, Police, Registry and permit services, Utilities, Tax and Land services*. The possible answers to the question are ‘Yes’, ‘No’ and ‘Don’t know/No response’. I construct a binary dummy variable from the responses by coding the ‘Yes’ –answers as 1 and the rest as 0.

The purpose of including this variable is to supply information on whether there are significant differences in the propensities of men and women to have contact with public officials. In many studies finding a difference between men and women in the frequency of encounters of bribery, a question has been left open whether the difference arises from different probabilities to have contacts with public officials.

A shortcoming of this variable is that it only indicates whether there has been at least one encounter of some of the officials surveyed. It is possible that there are differences between the respondents in how many times in total they have used the services provided by the officials. However, in case there would emerge major differences between groups of respondents, it is unlikely that these differences would not emerge visible in the analysis of the constructed variable.

Dependent variable 2. *Bribe paid*

¹⁵ This approach has been proposed by e.g. Olken (2009) and Treisman (2007)

The second dependent variable is based on responses to the GCB survey question *Q7B: In the past 12 months have you or anyone living in your household paid a bribe in any form to each of the following institutions/organizations?* The question has only been asked from the respondents that have reported a contact with any of the surveyed eight officials in the past 12 months¹⁶. The possible answers to the question are ‘Yes’, ‘No’ and ‘Don’t know/No response’. I construct a binary dummy variable from the responses by coding the ‘Yes’ –answers as 1 and the rest as 0.

Inclusion of this variable provides information on the actual payments of bribes in the respondents’ dealings with public officials. Therefore it is relevant for testing hypotheses 1, 3 and 4. The respondents are screened out by a previous question on contacts with officials, reducing the sample to those that report having had contact with officials. This eliminates a problem with many previous studies that have not been able to distinguish between those individuals that have actually had contact with officials.

A shortcoming of this variable is that it only indicates whether there has been at least one transaction with bribery. It is possible that there are differences between the respondents in how many times in total and with how large sums they have bribed officials. However, in case there would emerge major differences between groups of respondents, it is unlikely that these differences would not emerge visible in the analysis of the constructed variable

Dependent variable 3. *Bribe requested*

The third dependent variable is based on the GCB survey question *Q12. A. Have you ever been asked to pay a bribe?* The question has been asked from every respondent of the survey. The possible answers to the question are ‘Yes’, ‘No’ and ‘Don’t know/No response’. I construct a binary dummy variable from the responses by coding the ‘Yes’ –answers as 1 and the rest as 0.

This variable can bring insight to the question, whether lower levels of bribery among women may result from women simply being asked for bribes less often, for example because they are not seen as having as much money as men, i.e. hypothesis 2. If the hypothesis holds true, we should see a negative correlation between the frequency of women being asked for bribes and discrimination against women.

¹⁶ The basis for Dependent variable 1

Dependent variable 4. *Bribe payment refused*

The last dependent variable is based on the GCB survey question *Q12. B. If yes, have you ever refused to pay a bribe?*. The question has been asked from those respondents that have reported having been asked for a bribe, screening out those that don't report encountering requests for bribes. The possible answers to the question are 'Yes', 'No' and 'Don't know/No response'. I construct a binary dummy variable from the responses by coding the 'Yes' –answers as 1 and the rest as 0.

The variable provides information on the respondents' behavior when put into a situation, where they need to make a choice between corrupt and non-corrupt behavior. This is relevant to hypothesis 5, as a refusal to pay may be interpreted as an action representing a higher moral standard and thus individuals that are more likely to answer yes to this question could be considered less susceptible of corruption.

The interpretation of the data included in this variable is, however, not straightforward. Not every respondent may be in a situation to actually refuse a bribe payment when the person asking for a bribe is in an authoritative position relative to the respondent. Therefore, mainly in contexts with few discrimination against women and a high rule of law, we should see an increase in the rates of refusal for women if we were to expect that women are less corrupt than men.

5.3.2. Relationship between the four dependent variables

The dependent variables 1 and 2 are based on the Question 7 of the GCB 2013 survey. The question refers to the dealings with public officials and possible bribery in contact of the respondents by either themselves or other individuals living in their household¹⁷. The time span the question refers to is the past 12 months.

The dependent variables 3 and 4 are based on the Question 12 of the GCB 2013 survey. The question refers directly to requests of bribes and possible refusals to pay by the individual respondent. The time span this question refers to is 'ever'.

¹⁷ Despite the loose wording, the type of question is regularly interpreted to describe the personal dealings of the respondents. (Transparency International, 2010)

Figure 1 below illustrates the structure of a transaction between a bureaucrat and a client as a tree model. The information presented by dependent variables 1 and 2 are highlighted.

Figure 1 Illustration of information available from Question 7

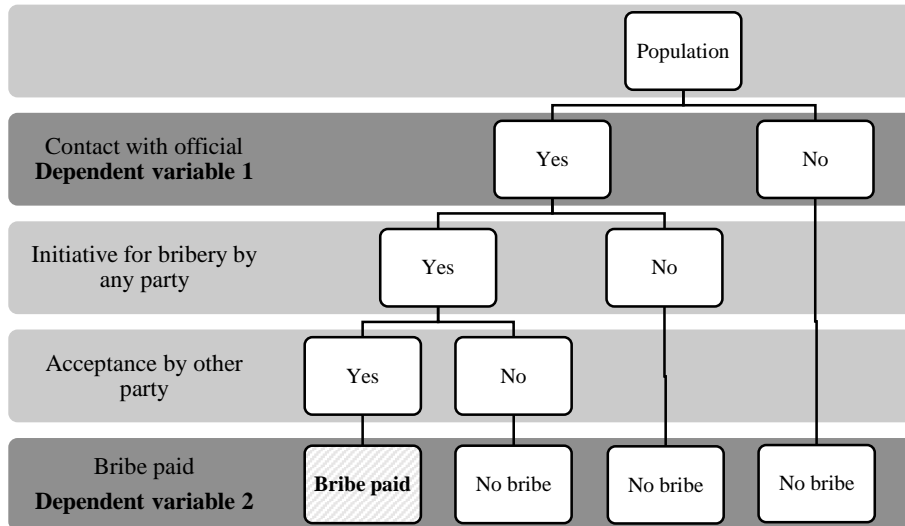
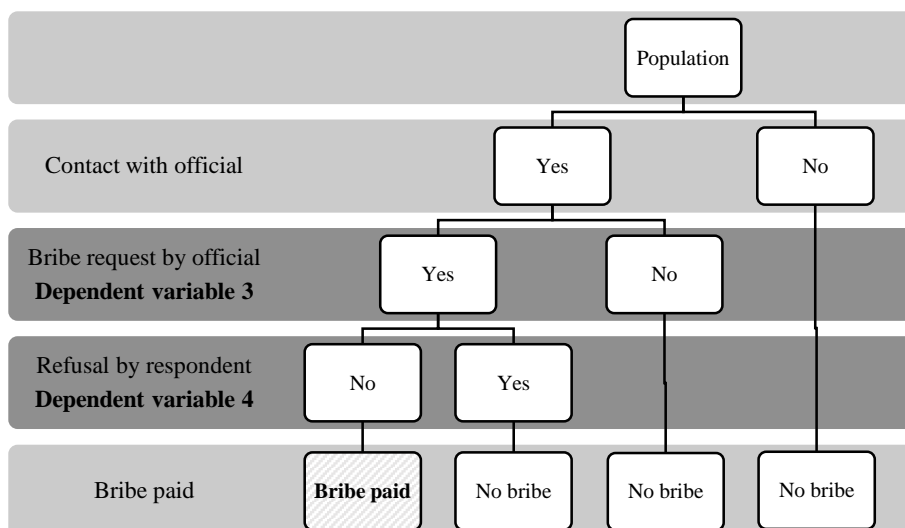


Figure 2 below illustrates again a structure of a transaction between a bureaucrat and a client. The information presented by dependent variables 3 and 4 are highlighted.

Figure 2 Illustration of information available from Question 12



The four dependent variables all include information relevant to different stages of a transaction with bribery. Ideally, there would be data on all the steps for individual transactions.

However, due to the survey design, the data is not directly comparable. First, the reference to the subject leaves room for different interpretations. Dependent variables 1 and 2 include only a circumstantial reference to the respondent, whereas the data in dependent variables 3 and 4 refer directly to the respondent. Second, the time span is different. Dependent variables 1 and 2 are based on experiences reported for the last 12 months whereas the dependent variables 3 and 4 are based on experiences for the complete lifetime of the respondents.

The limitations of the data brought in by the survey design essentially limit the power of the analysis made based on it. I mainly deal with the dependent variables separately. When looking at the results acquired for the different dependent variables derived from different survey questions in parallel, it needs to be acknowledged that the data is not directly intercomparable. However, the data is derived from a single sample of individuals, suggesting a rather close relationship between the results.

5.3.3. Explanatory variables

Gender of the respondent and an *interaction between gender and level of gender-based discrimination*¹⁸ are the explanatory variables in the analysis. Data on gender is derived directly from the GCB 2013 survey data. Additional data on gender-based discrimination comes from OECD Development Centre. The discrimination data is aggregated on the level of a country and linked to each respondent by their country of residence.

Explanatory variable 1. *Female*

The primary explanatory variable of the analysis is the dummy variable *female*. It takes a value of one if the respondent is female, zero if male. The complete sample of 113 270 observations consists of 56 447 (49.8%) of female and 56 823 (50.2%) of male respondents.

Explanatory variable 2. *Discrimination*

The secondary explanatory variable is discrimination against women in their respective countries, relevant for hypothesis 3. The data is derived from the OECD Development Centre's Social Institutions and Gender Index. I do not include this variable as an independent predictor, but I utilize an interaction between the primary explanatory variable *Gender* and the secondary explanatory

¹⁸ The level of a country

variable *Discrimination* to determine whether the standing of women in a society activates the difference between gender and corruption.

I do not include the discrimination against women as a separate standalone explanatory variable as it is included in country fixed effects with which I control for aggregate macro-level factors in a society affecting corruption. Also, social institutions influencing a society's attitude toward gender inequality may have an impact on corruption also in other ways, e.g. by altering the functioning of political systems. (Inglehart, Norris & Welzel, 2002; Rizzo, Abdel-Latif & Meyer, 2007)

Due to data missing for a substantial number of countries from the original aggregate SIGI index of gender equality, I construct my own sub-index with data from measures in the dimensions of discrimination against women most relevant for corruption. This allows me to utilize most of the observations from Transparency International GCB data as only five countries¹⁹ from the original sample are excluded from the analysis with the variable for discrimination.

The two sub-indices from the OECD SIGI dataset included in my adjusted *Discrimination* index are *Restricted civil liberties*, and *Restricted resources and assets*. As suggested by Branisa et al (2013), the restrictions in civil liberties of women may be of a particular relevance to corruption as they are especially harmful for active involvement of women in the public sphere. Furthermore, similarly relevant to corruption are the restrictions on the control of resources and assets by women, added in the current form of the indicator the 2014 revision of the SIGI. Considering payments of bribes, equal access to resources directly affects the ability of an individual to pay. Also, an individual with a lesser perceived ability to pay a bribe may be asked for bribes less often, thus bringing down the frequency of bribery for the affected group (Goetz, 2007). The other sub-indices do not bear a similarly direct relevance to corruption.

The sub-indices are calculated by the OECD Development Centre and the exact methodology can be found in the *SIGI Methodological Background Paper* (OECD Development Centre, 2014). The *Restricted civil liberties sub-index* covers indicators for *equal access to public space*, *political voice*, *political quotas*, *political representation* and *workplace rights*. The *restricted access to resources and assets sub-index* includes variables for *secure access to land*, *secure access to non-land assets*, *access to financial services* and *land titles owned by women*.

¹⁹ The countries not present in the SIGI data are Kosovo, Solomon Islands, South Sudan, Taiwan and Vanuatu

For the calculation of the new index *Discrimination*, I follow the same procedure as the OECD, where the resulting index is an unweighted average of a non-linear function of the sub-indices.

$$Discrimination = 1/2 \text{ Restricted resources and assets}^2 + 1/2 \text{ Restricted civil liberties}^2$$

The non-linear function arises from assumptions that 1) inequality related to gender corresponds to deprivation experienced by the affected women and 2) deprivation increases more than proportionally when inequality increases. Therefore a higher level of inequality is penalized in each of the dimensions. (OECD Development Centre, 2014)

The range of the resulting indicator goes from 0 to 0.816 with a mean of 0.191. The range of the SIGI index with all the five sub-indices included goes from 0 to 0.56 with a mean of 0.19. The resulting discrimination indicator is correlated to a higher degree with the SIGI composite index than any of the two sub-indices used to compute the indicator. Simultaneously the country coverage of the resulting index is far greater than that of the complete index.

Table 1 Pairwise correlations of SIGI components and the Discrimination index

	SIGI-index 2014 with all five sub-indices	Restricted resources and assets sub-index	Restricted civil liberties sub-index	Discrimination (constructed index)
SIGI-index 2014 with all five sub-indices	1			
Restricted resources and assets sub-index	0.77	1		
Restricted civil liberties sub-index	0.70	0.40	1	
Discrimination (constructed index)	0.85	0.80	0.80	1

All correlations are significant with $p < 0.001$

5.3.4. The Sample Splits

I examine the effect of gender on corruption in different types of institutional settings to test for hypothesis 4, i.e. the possibility that gender differences in corruption are driven by gender differences in risk aversion. To perform the analysis, I split the sample two times, by two different institutional

dimensions, ending up with four sub-samples. The dimensions, following previous research (Breen et al, 2015) are the rule of law and democratic development. I use the Rule of Law score from World Bank Worldwide Governance indicators to measure rule of law and Polity IV dataset to measure regime type.

The World Bank measure for rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (World Bank, 2015). Corruption overlaps with many of the concepts covered by the measure and the measure is also used as a component in the World Bank Control of Corruption Index (World Bank, 2015).

I determine a country as one with a high rule of law if the country's Rule of Law score (ranging from approximately -2.5 to 2.5) is equal to or higher than zero. Correspondingly, countries with a Rule of Law score below zero I consider as low rule-of-law. A similar method has been applied by e.g. Breen et al (2015). The decision to split the sample and analyze the high and low rule-of-law samples as separate cases is informed by the fact that the theoretical explanations for the relationship between corruption and gender may differ for different settings. As discussed above in more detail, corruption may be easier to use in a country with a low rule of law, as the risk for detection and punishment may often be higher in countries with high rule of law.

The Polity index is a combined indicator constructed as the difference between two components, democratic and autocratic tendencies in a country (Marshall, 2014). Following the literature in political science (Breen et al, 2015), I code a country as a democracy if its Polity score is equal to or greater than six, whereas countries with a Polity score of less than six I code as possessing more autocratic than democratic tendencies.

5.3.5. Control variables

I control for several important individual characteristics that have the potential to affect corruption outcomes. The control variables chosen are justified with findings from earlier literature on what determines the frequency of corruption on the level of an individual. In addition, I use country fixed effects to control for institutional and cultural differences between countries. The aim is to extract the

effect of gender, holding constant as many as possible other factors both on individual and contextual level.

The control variables drawn from the individual data and linked to the individual respondents are *age group*, *Education*, *Employment status*, *Income* and *Rural/urban*. For aggregate country-level effects of institutional, cultural and economic setting, I control for by including *Country fixed effects*. In the following, I provide more details on control variables used. I include a summary of all the variables in Appendix 2.

Respondent's age group

The respondents are divided in four groups by age²⁰. A separate dummy variable is assigned to each group, the variable taking value one, when the individual respondent belongs to the corresponding group and zero otherwise. *Age under 25* corresponds to a respondent age of below 25 years, with 21 283 individual observations. A group *Age 25-50* covers ages from 25 to 50 years with 61 628 observations, group *Age 51-65* includes ages from 51 to 65 years with 19 451 observations and *Age 65+* ages above 65 years with 7 211 observations. There are 3 697 observations missing data for the age category. *Age 25-50*, the primary working age population acts as the base group and is therefore excluded from the regression specification.

Education

To control for the effect of education, the respondents are divided into three groups by their level of education. The groups are assigned dummy variables, the variable taking value one, when the individual respondent belongs to the corresponding group and zero otherwise. Respondents with a highest attained education of secondary level are assigned the dummy variable *Secondary education*, including 22 780 observations. The dummy variable *Higher education* covers for respondents with a high level education (university), with 49 217 responses. These two groups are compared against the rest of the sample with less education.

Employment status

²⁰ The data includes also a continuous variable for age, but the number of missing values is 5985, which is somewhat greater than with the categorical classification (The respondents may be hesitant to reveal their exact age, or in the case of the least developed countries, may not be able to tell their exact age accurately). I have decided to use the categorical value for analysis for the sake of greater coverage.

In order to control for the effect of occupational status, the sample of respondents is divided in three groups according to their employment status. The groups are assigned dummy variables, the variable taking value one, when the individual respondent belongs to the corresponding group and zero otherwise. The 63 342 respondents that report their status as employed, in either the public or private sector, individual businesses or agriculture are assigned the dummy variable *Employed*. The 12 277 respondents reporting as unemployed, but seeking for employment, are assigned the dummy variable *Unemployed*. The third category, *Not working* covers for the individuals not working²¹ with 33 699 observations falling into this category. Respondents that have preferred not to answer the question or that have the data missing amount to 3 952.

Income

The control variable for the effect of income differences between individuals is also constructed with an ordinal variable with five income quintiles. The individuals are each assigned a category by their total household income before taxes, arranged into country-level quintiles by the Transparency International. I have assigned each quintile its own dummy variable to capture possible non-linear effects of income. The lowest quintile is represented by dummy variable *Income 1*, the second by *Income 2*, the third by *Income 3*, the fourth by *Income 4* and the fifth by *Income 5*. The lowest income quintile is the base category in the regression specification and thus excluded.

Rural/urban

The control variable for the type of environment is a categorical dummy variable *urban*, which takes value one for respondents living in urban and zero for respondents living in rural households.

Country fixed effects

The 113 270 individual survey responses are collected from 107 different countries worldwide. Countries represent the greatest level of geographic detail the respondents can be separated with. As each country differs from the others by institutional, cultural and economic settings, I have included a dummy variable for each country. This is to control for any *country fixed effects*, i.e. the effect of the environmental factors specific to each of the countries. The variable *Country* includes a three-letter code for each country as a factor variable. The first country in alphabetical order (Afghanistan (AFG)) acts as the base category against which the others are compared.

²¹ Unfortunately the data does not distinguish between students, individuals staying at home such as housewives or retired.

5.3.6. Summary of variable correlations

I present summary tables of the variables and the correlations between the independent variables in Appendices 2 and 3. Excluded from the independent variables correlations are the country dummy variables. However, I perform my analysis with cluster robust standard errors, clustering on the country level. On the correlations between other independent variables, I find no significant correlations of concern and assume there are no problems of multicollinearity. Most notably, the primary explanatory variable gender is correlated with the variable ‘not working’ by 0.21 on 0.01% significance level, likely due to a significant portion taking care of households as could be expected. In addition to employment status, gender is correlated with the level of education and level of income of the respondents.

5.4. Model specification

I proceed to formulate the model to estimate, finding basis from the theoretical consideration presented earlier. I return to the equation

$$p_i = \beta_1' Y_i \beta_2' C_j + v_i + u_j$$

which I employ as the basis for a maximum-likelihood probit model, through which I model the impact of gender on the dependent variables. The probit model belongs to the family of binary choice models (or univariate dichotomous models), which are designed to model the ‘choice’ between two discrete alternatives. As all the dependent variables are of a binary nature, the probit model suits the purpose of this analysis well. The model essentially describes the probability of a dichotomous outcome, depending on other characteristics attributed to a case (Verbeek, 2008). This yields the following function:

$$\text{Pr}(\text{event}) = \beta x + \varepsilon,$$

where x is a matrix of characteristics inherent to the individual and others, β the vector of coefficients

and ε is the error term. I apply the same model to all the dependent variables, assuming that the outcomes measured by each of the variables are affected by the same characteristics. The model to fit is

$$\Pr(\text{answer} = \text{positive}) = \Phi(\beta_i x_{ij})$$

with Φ as the cumulative normal function; answer taking the value 1 if the individual respondent has given a positive answer to the four survey question asked that act as the dependent variables; i the number of parameters to estimate and j is the individual. The country-level parameters are included in the model as individual characteristics and are identical for all observations that share the same country of origin.

The four different equations that are estimated in the base analysis.

Dependent variable 1. The dependent variable will take value 1 if the respondent reports to have had contact with officials in the last 12 months.

$$\Pr(\text{contact}) = \Phi(\beta_i x_{ij})$$

Dependent variable 2. The dependent variable will take value 1 if the respondent reports having paid a bribe in any of the contacts with public officials surveyed in question Q7A.

$$\Pr(\text{bribe}) = \Phi(\beta_i x_{ij})$$

Dependent variable 3. The dependent variable will take value 1 if a respondent reports ever having been asked for a bribe.

$$\Pr(\text{request}) = \Phi(\beta_i x_{ij})$$

Dependent variable 4. The dependent variable will take value 1 if a respondent reports ever having refused to pay a bribe.

$$\Pr(\text{refusal}) = \Phi(\beta_i x_{ij})$$

I include the effect of gender-based discrimination to female respondents with the inclusion of an interaction variable between the explanatory dummy variable *Female* and the other explanatory variable *Discrimination*. This allows me to analyse the specific effect of discriminating institutions to women.

Using the probit, it is possible to calculate the marginal effects of the variables on the probability $dPr(\text{answer} = 1)/dx_i$, which can be read as the change in the probability of paying a bribe when the variable x_i changes its value with all other things equal. However, as discussed before, there is such uncertainty concerning the magnitudes of effects that in my analysis I concentrate merely on the directions and relative magnitudes of the different coefficients. Furthermore, the marginal effect calculation for an interaction term is hard to interpret in a meaningful way.

I apply cluster and heteroskedasticity robust standard errors clustered by country throughout the analysis to cope with heteroscedasticity. As a robustness check I duplicate the analysis with a linear probability model (Verbeek, 2008).

6. Results of the empirical analysis and discussion

I first review the results for the full sample, providing results for hypotheses 1, 2, 3 and 5. Second, I move on to discuss the results for the sample splits to see how the results change in different institutional settings. This is mainly relevant to Hypothesis 4. Furthermore, the sample splits act as a robustness check for the other hypotheses. The results from the empirical analysis largely confirm hypotheses 1 and 2. Hypothesis 3 receives some support while hypotheses 4 and 5 are rejected.

I present summary tables for the regressions, including the dependent variables and the explanatory variables, excluding control variables for clarity. Full probit regression summary tables with the control variables are included in Appendix 4. The samples for the regressions have been adjusted to only include cases with complete observations for each variable included, accordingly affecting the sample sizes.

6.1. Results for the full data sample

The results for the full data sample largely confirm the Hypothesis 1. In the results presented in Table 3, women appear less likely than men to pay bribes to public officials. Women are statistically significantly to the level $p < 0.01$ less likely than men to report having been involved in transactions with bribery in the previous 12 months. This is not driven by female gender being associated with fewer contacts with officials. There is an association between female gender and The results are reinforced by the simple probabilities in table 2. 33.5% of men that have had contact with public officials report having paid a bribe at least once, while the figure for women is only 27.7%. The frequency of men and women to report contact with public officials in the past 12 months, not controlling for any other characteristics, is very close to equal.

Hypothesis 3, testing for the effect of discrimination to bribery reported by women relative to men does not receive strong support from the regression results for the dependent variable 2, presented in Table 3. With the inclusion of the interaction between the dummy variable gender and the country-level indicator for gender-based *discrimination*, the association between reported bribes and gender alone is somewhat weakened, but remains strongly statistically significant. The coefficient for the gender-discrimination interaction is negative, as stated in the hypothesis, but fails to achieve

statistical significance even at the level $p < 0.1$. The Akaike information criterion, however, shows that the relative quality of the model improves when the interaction between the gender dummy and the country-level discrimination indicator is included.

Table 2 Simple probabilities of Dependent variable outcomes by gender, complete data

	DV1 Contact with public officials in the past 12 months	DV2 Transaction in the past 12 months included bribery	DV3 Respondent has ever been asked for a bribe	DV4 Respondent has ever refused to pay a bribe after a request
Female	74.1%	27.7%	28.5%	62.4%
Male	74.8%	33.5%	37.7%	62.4%

Table 3 Regression results for dependent variables 1 and 2

<i>Dependent variable:</i>				
	Contact with officials	Bribe paid	Contact with officials	Bribe paid
Female	-0.031 (0.020)	-0.132*** (0.020)	0.021 (0.024)	-0.111*** (0.031)
Female:Discrimination			-0.253** (0.110)	-0.094 (0.113)
Constant	0.729*** (0.032)	0.304*** (0.030)	0.728*** (0.031)	0.306*** (0.032)
Observations	104,615	78,640	100,603	75,139
Log Likelihood	-36,128.160	-39,514.340	-34,766.170	-37,544.670
Akaike Inf. Crit.	72,482.320	79,230.680	69,750.330	75,283.350

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Interestingly, the inclusion of the gender-discrimination interaction appears to have an association with the probability of women having contact with public officials. The results in Table 3 show that the likelihood that women report contact with officials decreases, when the presence of gender-based discrimination increases. The result is statistically significantly to the level $p < 0.05$. The inclusion of the gender-discrimination interaction term increases the relative quality of the model, indicated by the Akaike information criterion lower than in the model without the interaction term.

Hypothesis 2, proposing that women and men are not treated equally by public officials, receives strong support from the results presented in Table 4. The likelihood of reporting requests for bribes by officials is strongly negatively associated with female gender, indicated by a p value < 0.01 for cases with and without the inclusion of the gender-discrimination interaction term. The same tendency is visible in Table 2, where the simple probability for women to have reported requests for bribes is only 28.5% against 37.7% figure for men.

Table 4 Regression results for Dependent variables 3 and 4

	<i>Dependent variable:</i>			
	Bribe requested	Bribe payment refused	Bribe requested	Bribe payment refused
Female	-0.250*** (0.021)	0.005 (0.020)	-0.251*** (0.028)	0.047* (0.025)
Female:Discrimination			-0.002 (0.097)	-0.150** (0.076)
Constant	-0.017 (0.028)	0.241*** (0.032)	-0.015 (0.029)	0.244*** (0.033)
Observations	104,615	36,408	100,603	35,237
Log Likelihood	-53,223.430	-22,873.090	-51,028.320	-22,100.060
Akaike Inf. Crit.	106,672.900	45,972.170	102,274.600	44,418.120

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

The inclusion of the interaction term between female gender and the indicator for gender-based discrimination does improve the relative quality of the model, measured with the Akaike information criterion. However, the coefficient for this factor does not appear as statistically significant nor does it have a high magnitude, undermining Hypothesis 3. This suggests that the reason for public officials not asking women for bribes as often as they do ask men might lie somewhere else than in the forms of discrimination directed at women.

Hypothesis 5 has the purpose of testing, whether women are more strongly opposing corruption by refusing bribe payments when asked for one. This hypothesis cannot be outright rejected. The simple probabilities in Table 2 show an identical percentage of men and women to report having refused a bribe payment when asked for one. Also the regression results in Table 4 do not show any strong or statistically significant association between gender and the probability to have refused bribe payments when the gender-discrimination interaction term is not included in the analysis. However, upon the interaction term and therefore control for discrimination, there emerges an association between female gender and a higher probability to report having refused to pay a bribe, significant to $p < 0.1$. The same regression indicates a relationship between female gender and a lesser likelihood to refuse payments of bribes under conditions of higher gender-based discrimination. This result seems sensible in the light that institutional discrimination against an individual's group intuitively makes it harder to refuse requests from an authority.

Based on the results from the complete data set, I conclude that Hypotheses 1 and 2 can be accepted based on the data. There indeed is a robust correlation between female gender and fewer reports of bribes paid in transactions with public officials. A similarly robust correlation there is between female gender and the likelihood of reporting having been asked for bribes. This would strongly suggest that the reason behind women not bribing as often as men would lie in differences in treatment of the genders by public officials. However, it must be emphasized that although the domain of respondents for the survey data is uniform, the questions from which the dependent variables used to test for these hypotheses are not directly comparable.

Hypothesis 3, intended to test for the effect of discrimination, again is more or less rejected by the data. The data fails to show a significant association between either the reports of bribe payments or reports of bribe requests by women and the level of gender-based discrimination in a society. The independent variable *discrimination* does seem to incorporate some new and relevant information as

the fit of the model improves with the inclusion of the term and the interaction term used gains meaningful coefficients predicting other dependent variables.

Hypothesis 5 is supported by the negative coefficient of the interaction between female gender and gender-based discrimination predicting the probability of respondents to refuse payments of bribes. Simultaneously, the coefficient for female gender alone emerges as positive, hinting at the possibility that women under some circumstances do refuse paying bribes easier than men do. When the gender-discrimination interaction is not included in the analysis, there emerges no difference between men and women in relation to dependent variable 4. It must, however, be noted that the interpretation of dependent variable 4 is not very simple, as there are likely to be many different factors affecting the dynamics of deciding to pay or refuse paying a bribe.

6.2. Results for sample splits by institutional settings

I present results for the four sub-samples with different institutional characteristics to evaluate hypothesis 4 of gender differences in risk aversion causing gender differences in corruption. The results for the sub-samples also act as a robustness check for the analysis of the complete sample presented in part 6.1. Different from the previous presentation, I go through the four different dependent variables one at a time, presenting the results for both the sample splits simultaneously.

The analysis of the results for the sub-samples leads me to reject hypothesis 4. Hypotheses 1 and 2 receive further confirmation. Hypothesis 3 appears also relevant in certain cases. For hypothesis 5 there is very modest indication of relevance.

6.2.1. Dependent variable 1: Contact with officials

The simple probabilities of the respondents' answers to whether there has been a contact to public officials in the 12 months preceding the survey are presented in Table 5. There is rather minor variability in the responses and no pattern emerges by the types of societal institutions.

Table 5 Probabilities to report contact with officials by gender and institutional context

	High Rule of Law	Low Rule of Law	Democracy	Autocracy
Female	77.2%	72.5%	72.9%	76.7%
Male	76.7%	74.0%	72.9%	78.7%

No definite pattern emerges in the results shown in Table 6 on any gender effect on the probability to report contact with public officials over a 12-month period. There is a consistently negative coefficient for the interaction term between female gender and gender-based discrimination against women, but the coefficient is statistically significant ($p < 0.05$) only in the context with high rule of law. More importantly, when the interaction term is included, gender alone bears no statistically significant correlation with the probability to report contact with officials. Without the inclusion of the interaction term, there is a somewhat weak correlation between female gender and the probability to report contact with officials in contexts of low rule of law and dominant autocratic institutions. Including the consideration for discrimination mitigates this correlation. Inclusion of the interaction term improves the quality of the model in all the cases, judging by the Akaike information criterion.

Table 6 Split sample regression results Dependent variable 1

		<i>Dependent variable:</i> Contact with officials							
		High rule of law		Low rule of law		Democracy		Autocracy	
Female		0.021 (0.026)	0.075*** (0.028)	-0.059** (0.027)	-0.030 (0.039)	-0.008 (0.024)	0.028 (0.025)	-0.070* (0.039)	-0.012 (0.055)
Female:Discrimination			-0.455** (0.230)		-0.107 (0.120)		-0.199 (0.123)		-0.240 (0.176)
Constant		0.794*** (0.044)	0.765*** (0.053)	0.753*** (0.046)	0.742*** (0.045)	-5.590*** (0.182)	-5.590*** (0.183)	0.738*** (0.060)	0.723*** (0.058)
Observations		34,804	33,299	68,772	66,265	65,667	63,160	34,197	33,197
Log Likelihood		-12,730	-12,293	-22,692	-21,767	-22,289	-21,331	-11,425	-11,017
Akaike Inf. Crit.		25,554	24,677	45,540	43,686	44,731	42,811	22,939	22,124

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

My interpretation of the results of the split-sample regression for dependent variable 1 is that generally there are relatively minor gender-differences in the probability to have contact with public officials. Discrimination against women is, however, a factor to consider in some contexts.

6.2.2. Dependent variable 2: Bribe paid

Hypothesis 4 of higher risk aversion driving the gender difference in bribe payment higher in societies less condoning of bribery does not receive support from the data. When looking at the simple probabilities over all the different sub-samples presented in Table 7, women are consistently less likely than men to report payments of bribes, given a reported contact with officials. Interestingly, the gender difference is the smallest over contexts with a high rule of law, where also the overall reports for bribe payments are the least frequent.

The results from the regression analysis similarly contradicts hypothesis 4. The pattern emerging in the simple probabilities does not change when other attributes are controlled for. Women appear consistently less likely to report paying bribes than men do. However, the magnitude of the correlation is lower in contexts of high rule of law than in ones of low rule of law. Similarly, under dominantly democratic institutions the gender effect is lower than under dominantly autocratic institutions. Thus the data speaks strongly for rejecting hypothesis 4.

Table 7 Probabilities to report involvement in bribery by gender and institutional context

	High Rule of Law	Low Rule of Law	Democracy	Autocracy
Female	13.7%	36.4%	21.7%	40.8%
Male	16.3%	43.1%	27.3%	47.0%

The results in Table 8 lend further support to hypothesis 1 that women indeed pay less bribes than men do. When the interaction between female gender and gender-based discrimination is not included, women are less likely to report payments of bribes in every institutional context.

Hypothesis 3 that did not receive significant support from the results derived from the complete sample, again when tested for the smaller sub-samples, is supported by results in certain contexts in

Table 8. When the rule of law is high, the difference between men and women appears nearly completely driven by the interaction between discrimination in a society and female respondents. The coefficient for the interaction variable is relatively high in magnitude and statistically significant for the sub-samples for both dominantly democratic and autocratic institutions. Only for the institutional setting of low rule of law the inclusion of the gender-discrimination interaction term does not change the coefficients by much. The inclusion of the interaction term adds to the relative quality of the model for each sub-sample, measured by the Akaike information criterion.

Table 8 Split sample regression results Dependent variable 2

	<i>Dependent variable:</i>							
	Bribe paid							
	High rule of law		Low rule of law		Democracy		Autocracy	
Female	-0.074*** (0.026)	-0.026 (0.031)	-0.154*** (0.026)	-0.153*** (0.041)	-0.136*** (0.029)	-0.094*** (0.032)	-0.150*** (0.030)	-0.082* (0.048)
Female:Discrimination		-0.322*** (0.082)		0.010 (0.131)		-0.281* (0.163)		-0.227** (0.115)
Constant	-2.100*** (0.057)	-2.110*** (0.064)	0.284*** (0.039)	0.279*** (0.040)	-0.911*** (0.046)	-0.917*** (0.049)	0.236*** (0.039)	0.234*** (0.040)
Observations	26,908	25,557	51,060	48,910	48,431	46,295	26,587	25,727
Log Likelihood	-9,428	-8,695	-29,740	-28,498	-21,078	-19,861	-16,805	-16,223
Akaike Inf. Crit.	18,944	17,477	59,618	57,130	42,289	39,851	33,695	32,530

Note:

* p<0.1; ** p<0.05; *** p<0.01

6.2.3. Dependent variable 3: Bribe requested

Hypothesis 2 is essentially confirmed by the results for every sub-sample split by the institutional qualities. Women report consistently and remarkably less occurrences of requests for bribes. The

gender difference is visible in all the contexts in the simple probabilities in Table 9, as well as in the regression results in Table 10.

Table 9 Probabilities to report having been asked for a bribe by gender and institutional context

	High Rule of Law	Low Rule of Law	Democracy	Autocracy
Female	13.6%	37.4%	24.5%	37.7%
Male	20.0%	47.4%	33.4%	47.8%

The results of the split-sample regressions for dependent variable 3 speak further for that hypothesis 3 proposing gender discrimination as an influential factor behind the gender differences in corruption should not be outright rejected. Instead the results suggest discrimination does play a role in determining the gender-corruption relationship. The interaction term between female gender and gender-based discrimination against women emerges statistically significant in contexts of high rule of law and dominant autocratic institutions, but not for contexts of low rule of law and dominantly democratic institutions. The inclusion of the interaction variable again improves the relative model quality measured by the Akaike information criterion.

Table 10 Split sample regression results Dependent variable 3

	<i>Dependent variable:</i>							
	Bribe requested							
	High rule of law		Low rule of law		Democracy		Autocracy	
Female	-0.268*** (0.033)	-0.246*** (0.041)	-0.245*** (0.025)	-0.247*** (0.036)	-0.270*** (0.028)	-0.287*** (0.032)	-0.245*** (0.032)	-0.138*** (0.041)
Female:Discrimination		-0.258** (0.121)		0.015 (0.104)		0.091 (0.150)		-0.389*** (0.131)
Constant	-1.660*** (0.039)	-1.670*** (0.043)	-0.052 (0.036)	-0.052 (0.037)	0.874*** (0.043)	0.875*** (0.044)	-0.067 (0.044)	-0.064 (0.046)
Observations	34,804	33,299	68,772	66,265	65,667	63,160	34,197	33,197
Log Likelihood	-13,429	-12,717	-39,394	-37,906	-30,164	-28,876	-20,806	-20,112
Akaike Inf. Crit.	26,951	25,527	78,945	75,965	60,481	57,899	41,701	40,313

Note:

* p<0.1; ** p<0.05; *** p<0.01

6.2.4. Dependent variable 4: bribe payment refused

There is again no support for hypothesis 4 of higher risk aversion by women to lead in less corrupt behavior under institutions less condoning of bribery. The results derived dependent variable 4, the probability of refusing a bribe when one is requested, show relatively few gender differences overall, whereas for the hypothesis to hold true, women should be more likely to refuse bribe payments under institutions, where risk of detection and punishment is higher.

Table 11 Probabilities to report having refused to pay a bribe by gender and institutional context

	High Rule of Law	Low Rule of Law	Democracy	Autocracy
Female	67.1%	61.4%	65.4%	57.4%
Male	68.4%	61.0%	64.9%	57.6%

Table 12 Split sample regression results Dependent variable 4

<i>Dependent variable:</i>								
Bribe payment refused								
	High rule of law		Low rule of law		Democracy		Autocracy	
Female	0.007 (0.046)	-0.027 (0.069)	0.005 (0.022)	0.065** (0.026)	0.028 (0.029)	0.051* (0.030)	-0.021 (0.026)	0.040 (0.048)
Female:Discrimination		0.245 (0.159)		-0.210*** (0.080)		-0.082 (0.129)		-0.209** (0.105)
Constant	1.210*** (0.093)	1.240*** (0.097)	0.239*** (0.036)	0.245*** (0.036)	0.850*** (0.061)	0.856*** (0.063)	0.189*** (0.038)	0.190*** (0.039)
Observations	6,115	5,842	30,189	29,291	20,428	19,820	14,656	14,171
Log Likelihood	-3,647	-3,486	-19,153	-18,538	-12,397	-12,005	-9,682	-9,350
Akaike Inf. Crit.	7,387	7,065	38,462	37,228	24,947	24,159	19,455	18,790

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

There is no clear gendered pattern in the simple probabilities for bribe payment refusal in Table 11. Instead, the percentages are very close to each other for both genders. The results of the regressions in Table 12 confirm this. Gender alone as an explanatory variable does not emerge as a significant predictor of refusals to pay bribes. However, it should be further noted that the analysis of the results presented in Table 12 suffer from the sample sizes being remarkably reduced.

Hypothesis 5, stating that women would on average show less corrupt behavior when faced with a direct decision does not receive strong support from the results for the sub-samples. There is a minor effect that appears statistically significant in the context of low rule of law ($p < 0.05$) and dominant democratic institutions ($p < 0.1$) when the interaction term between female gender and gender-based discrimination is included. In the same samples, the coefficient for the interaction term appears statistically significant and relatively high in magnitude.

6.3. Control variables

The statistical associations between the control variables and the dependent variables emerged largely as expected, thus confirming the validity of the choice of control variables. I briefly discuss the main findings in here. Summary tables of binomial probit regressions with the full data sample, including a presentation of the control variables, are presented in Appendix 4. All the regressions include dummy variables for individual countries to account for the country fixed effects, but they are not included in the summary tables for clarity of presentation.

Age emerges as a statistically significant factor associated with the frequency of reported payments of bribes and the frequency at which individuals report having been asked for bribes. The earlier finding that the youngest and oldest individuals are asked for bribes less often than the individuals in the most active age (Mocan, 2008) is confirmed by the data. Also, an association between higher age and lesser propensity to pay bribes (Torgler & Valev, 2006) is supported by the results. Age does not emerge as a robustly statistically significant correlate with the frequency of reported contacts with public officials or refusals to pay bribes.

Higher education appears also as a statistically significant correlate with reported bribe payments. Individuals with a higher education are less likely to report payments of bribes, confirming some earlier findings (Truex, 2010). Earlier research has suggested increasing levels of education to be correlated with higher frequency of bribe requests on the level of an individual. This, however, is not supported by my results. Individuals with a secondary education are the least likely report being targeted with requests for bribes, but also individuals with a higher education report less requests for bribes than the comparison group with education levels lower than secondary. Interestingly, individuals with a secondary education seem also the least likely to refuse a bribe when asked for one, with the highest educated individuals also reporting fewer refusals than the lowest-educated comparison group. Simultaneously, increasing level of education is linked with fewer reported contacts with officials.

There emerges a rather robust relationship between higher income and higher propensity to report bribes paid. Similarly, higher income is statistically significantly related with higher probability to report having been asked for bribes, much in line with earlier research (Seligson, 2006; Mocan, 2008). Higher income is also correlated with a higher probability to report having had contact with officials. No relation emerges between reports of refusals to pay bribes and different income groups.

Employment status also correlates with many of the dependent variables. Individuals outside of the workforce are less likely to report payments of bribes and requests for bribes than those taking actively part in the society. Unemployment again is associated with fewer contacts to public officials. The variables do not show statistically significant associations with the probability to refuse bribe payments.

Lastly, urban population appears as slightly more likely than rural respondents to report having refused to pay bribes. Otherwise there emerge no statistically significant relationship between the urban/rural setting and the dependent variables, although some studies have found urban populations to be targeted with bribery more often than their rural counterparts (Mocan, 2008; Justesen & Bjørnskov, 2014).

6.4. Other methods tested

As a robustness check I run analysis with similar specifications to those presented earlier in this chapter using the ordinary least squares method (OLS). Summary tables of the results are presented in Appendix 5. Additionally, I run analysis experimenting with different types of dependent variables to control for potential reticence bias, described in part 5.5.1. None of the alternative methods and specifications produce results significantly different than those that arise from the primary binomial probit analysis with the primary dependent variables.

6.5. Discussion

The overall results from the empirical analysis lend strong enough support to hypothesis 1 that it can be accepted. Women are less likely to report having paid bribes, confirming earlier findings claiming that women indeed emerge as a group being less likely to bribe than men (e.g. Swamy et al, 2001; Breen et al, 2015).

Considering the reasons behind the robust difference between men and women in the probability to pay bribes, a gendered bias in treatment of individuals seems likely to play an important role. My analysis supports my hypothesis 2 fairly robustly, indicating that there is a difference between the genders in how individuals representing their respective gender are treated by public officials on the average. Women consistently report requests for bribes less often than men do, similar to many earlier findings (e.g. Seligson, 2006; Mocan, 2008).

The described gender difference in bureaucrats' treatment of clients may be explained by discrimination, or women being seen as less wealthy and able to pay (Goetz, 2007). As women are often a minority in the public sphere²², there may be a higher social distance between a female client and the average public official. Social distance again has been shown to decrease levels of corruption in transactions (Ryvkin & Serra, 2011).

However, it cannot be completely ruled out that the bureaucrats would be sufficiently able to distinguish between their clients, only asking for bribes from those clients that they can assume to pay. This leaves room for the possibility that women indeed for a reason behave more public-mindedly than men as a group, leading to lower levels of bribery in transactions involving a woman.

²² Demonstrated e.g. by the OECD SIGI index

Furthermore, women may be asked for non-monetary bribes more often than men and these might show differently in the data.

My analysis does not imply a robust relationship between women's propensity to behave corrupt and gender-based discrimination against women. However, in many occasions the term involving country-level gender discrimination did gain significance in the analysis and I do not reject the hypothesis 3, stating that gender discrimination should explain the gender difference in bribery. The association of discrimination with women's self-reported bribery levels did appear often enough that I see motivation to research the topic further with an improved research design.

The recently proposed mechanism that women's higher risk aversion would cause women behave less corrupt in certain contexts (Esarey & Chirillo, 2013) did not receive support from my analysis. Instead, the analysis showed slight changes in the coefficients for the explanatory gender variable, but these changes were of the opposite direction from the hypothesis. Therefore, I reject hypothesis 4.

I also attempted to establish a connection between gender and a clear situation of choice by individuals to bribe or not to bribe. Evidence in support of hypothesis 5 from the analysis was scarce and the interpretation is not necessarily on a solid basis, given that there are other factors affecting the individual's behavior but just the moral stand on corruption. In some cases when including the interaction between female gender and gender-based discrimination, there emerged a very slight association with female gender and a higher likelihood to refuse payment of a bribe after a request. However, this finding depended on the inclusion of the term including discrimination and the magnitude of the association appeared in every case on the lower side. Thus, hypothesis 5 is rejected with the reservation that the interpretation is based on rather few contextual information.

To conclude, my analysis shows that women appear indeed less likely to pay bribes than men. The analysis also shows that women appear less likely to be asked for bribes than men, which is a likely explanation for women's lower propensity to engage in bribery. There is some evidence that higher gender-based discrimination may be linked with lower propensity of women to engage in bribery, further speaking for gender-differences in treatment by officials as a possible cause for gender differences in propensity to bribe. Women being more risk averse than men does not seem as a likely explanation for the gender difference in bribery levels. Neither does my analysis show strong

evidence for women on average behaving any different from men when facing a simple decision to bribe or not to bribe.

7. Conclusion

This study confirms the finding made in many previous studies that women appear to engage in self-reported bribery less frequently than men do. This corruption-gender link proves close to universal and robust to a broad set of control variables.

So far, three different mechanisms have emerged in literature to explain this gender difference: differences in treatment and opportunities between men and women; women demonstrating higher overall integrity for either biological or cultural reasons; and gender differences in levels of risk aversion. This study provides evidence to support the hypothesis that the gender difference in propensity to engage in bribery originates rather in differential treatment of women than in any innate qualities of women.

If the results are in line with reality, increasing the share of women in public life is not likely to cause corruption to decrease in a society, although a decrease in corruption levels is often observed simultaneously with improving gender equality. The achieved results naturally do not mean that improving gender equality would not mean that gender equality should not be promoted for other reasons. Neither does it mean that in some micro-contexts increasing women's participation couldn't cause decreasing corruption rates.

As a perspective for further research, I would consider studying how discrimination against groups of citizens affects their propensity to engage in corrupt behavior. The discrimination needs not be restricted to only women, but any groups that can be seen as minorities in its respective society. Another need for further work is in producing better quality data on the reality of corruption.

References

- Acemoglu, D., & Verdier, T. (2000). The Choice between Market Failures and Corruption. *The American Economic Review*, 90(1), 194-211.
- Ades, A., & Di Tella, R. (1997). The New Economics of Corruption: a Survey and Some New Results. *Political Studies*, 45(3), 496-515.
- Ades, A., & Di Tella, R. (1999). Rents, Competition and Corruption. *The American Economic Review*, 89(4), 982-993.
- Aidt, T. (2009). Corruption, institutions, and economic development. *Oxford Review of Economic Policy*, 25(2), 271-291.
- Alatas, V., Cameron, L., Chaudhuri, A., & Erkal, N. a. (2009). Gender, culture, and corruption: Insights from an experimental analysis. *Southern Economic Journal*, 663-680.
- Alhassan-Alolo, N. (2007). Gender and corruption: Testing the new consensus. *Public Administration and Development*, 27(3), 227-237.
- Andreoni, J., & Vesterlund, L. (2001). Which is the fair sex? Gender differences in altruism. *Quarterly Journal of Economics*, 293-312.
- Andvig, J., & Moene, K. (1990). How corruption may corrupt. *Journal of Economic Behavior and Organization*, 13, 63-76.
- Armantier, O., & Boly, A. (2011). A controlled field experiment on corruption. *European Economic Review*, 55(8), 1072-1082.
- Armantier, O., & Boly, A. (2012). On the External Validity of Laboratory Experiments on Corruption. *Research in Experimental Economics*, 15, 117-144.
- Azfar, O., & Murrell, P. (2009). Identifying Reticent Respondents: Assessing the Quality of Survey Data on Corruption and Values. *Economic Development and Cultural Change*, 57(2), 387-411.
- Banerjee, A. S. (2012). Corruption. *Massachusetts Institute of Technology Department of Economics Working Paper Series*(12-08).
- Banuri, S., & Eckel, C. (2012). "Chapter 3 Experiments in Culture and Corruption: A Review" In New Advances in Experimental Research on Corruption. *Research in Experimental Economics*, 15, 51-76.
- Barr, A., Lindelow, M., & Serneels, P. (2009). Corruption in public service delivery: An experimental analysis. *Journal of Economic Behavior & Organization*, 72, 225-239.

- Becker, G. S. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76, 169-217.
- Betz, M., O'Connell, L., & Shepard, J. M. (1989). Gender differences in proclivity for unethical behavior. *Journal of Business Ethics*, 8(5), 321-324.
- Beu, D. S., Buckley, M. R., & Harvey, M. G. (2003). Ethical decision-making: A multidimensional construct. *Business Ethics: A European Review*, 12(1), 88-107.
- Björn, F., & Schulze, G. G. (2000). Does economics make citizens corrupt? *Journal of economic behavior & organization*, 43(1), 101-113.
- Bjørnskov, C. (2011). Combating Corruption: On the Interplay between Institutional Quality and Social Trust. *Journal of Law and Economics*, 54(1), 135-159.
- Boehm, F. (2015, May). Are men and women equally corrupt? *U4 Brief*. U4 Anti-Corruption Resource Centre.
- Branisa, B., Klasen, S., & Ziegler, M. (2013). Gender inequality in social institutions and gendered development outcomes. *World Development*, 45, 252-268.
- Breen, M., Gillanders, R., McNulty, G., & Suzuki, A. (2015). Gender and corruption in business. *HECER Discussion Paper No. 391*.
- Buchan, N. R., Croson, R. T., & Solnick, S. (2008). Trust and gender: An examination of behavior and beliefs in the Investment Game. *Journal of Economic Behavior & Organization*, 68(3), 466-476.
- Cadot, O. (1987). Corruption as a gamble. *Journal of Public Economics*, 33, 223-244.
- Chatterjee, I., & Ray, R. (2012). Does the evidence on corruption depend on how it is measured? Results from a cross-country study on microdata sets. *Applied Economics*, 44(25), 3215-3227.
- Chaudhuri, A. (2012). Gender and corruption: A survey of the experimental evidence. In *New Advances in Experimental Research on Corruption (Research in Experimental Economics, Volume 15)* (pp. 13-49). Emerald Group Publishing Limited.
- Clarke, G. R. (2010). How Petty is Petty Corruption? Evidence from Firm Surveys in Africa. *World Development*, 39(7), 1122-1132.
- Clausen, B., Kraay, A., & Murrell, P. (2010). Does Respondent Reticence Affect the Results of Corruption Surveys? *World Bank Policy Research Working Paper*, 5415.
- Council of Europe. (2014, September 23). Gender dimensions of corruption. Strasbourg. Retrieved March 21, 2016, from <http://www.assembly.coe.int/CommitteeDocs/2014/ardocinf07-2014.pdf>
- Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic literature*, 448-474.

- Debski, J., & Jetter, M. (2015). Gender and Corruption: A Reassessment. *IZA Discussion Papers, No. 9447*.
- Dollar, D., Fisman, R., & Gatti, R. (2001). Are women really the “fairer” sex? Corruption and women in government. *Journal of Economic Behavior & Organization, 46*(4), 423-429.
- Donchev, D., & Ujhelyi, G. (2014). What do Corruption Indices Measure? *Economics & Politics, 26*(2), 309-331.
- Dreber, A., & Johannesson, M. (2008). Gender differences in deception. *Economics Letters, 99*(1), 197-199.
- Dreher, A., & Gassebner, M. (2011). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice, 155*, 413-432.
- Eagly, A. H., & Steffen, V. J. (1986). Gender and aggressive behavior: a meta-analytic review of the social psychological literature. *Psychological bulletin, 100*(3), 309.
- Echazu, L. (2010). Corruption and the balance of gender power. *Review of Law & Economics, 6*(1), 59-74.
- Esarey, J., & Chirillo, G. (2013). Fairer Sex” or Purity Myth? Corruption, Gender, and Institutional Context. *Politics & Gender, 9*(4), 361-389.
- Fan, C. S., Lin, C., & Treisman, D. (2009). Political decentralization and corruption: Evidence from around the world. *Journal of Public Economics, 93*, 14-34.
- Fisman, R., & Miguel, E. (2007). Corruption, Norms, and Legal Enforcement: Evidence from Diplomatic Parking Tickets. *Journal of Political Economy, 115*(6), 1020-1048.
- Frank, B., Lambsdorff, J. G., & Boehm, F. (2011). Gender and Corruption: Lessons from Laboratory Corruption Experiments. *European Journal of Development Research, 23*, 59-71.
- Goetz, A.-M. (2007). Political Cleaners: Women as the New Anti-Corruption Force? *Development and Change, 38*(1), 87-105.
- Gorodnichenko, Y., & Sabirianova Peter, K. (2007). Public sector pay and corruption: Measuring bribery from micro data. *Journal of Public Economics, 91*, 963-991.
- Guerrero, M. A., & Rodriguez-Oreggia, E. (2008). On the individual decisions to commit corruption: A methodological complement. *Journal of Economic Behavior & Organization, 65*(2), 357-372.
- Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty? *Economics of governance, 3*, 23-45.
- Gutmann, J., Padovano, F., & Voigt, S. (2015, September 11). Perception vs. Experience: Explaining Differences in Corruption Measures Using Microdata. Retrieved from <http://dx.doi.org/10.2139/ssrn.2659349>

- Holmberg, S., Rothstein, B., & Nasiritousi, N. (2009). Quality of Government: What You Get. *Annual Review of Political Science*, 12, 135-161.
- Inglehart, R., Norris, P., & Welzel, C. (2002). Gender equality and democracy. *Comparative Sociology*, 1(3-4), 321-345.
- Jensen, N. M., Li, Q., & Rahman, A. (2010). Understanding corruption and firm responses in cross-national firm-level surveys. *Journal of International Business Studies*, 41(9), 1481-1504.
- Jetter, M., Montoya Agudelo, A., & Ramirez Hassan, A. (2015). The Effect of Democracy on Corruption: Income is Key. *World Development*, 74, 286-304.
- Jianakoplos, N. A., & Bernasek, A. (1998). Are women more risk averse? *Economic inquiry*, 36(4), 620-630.
- Justesen, M. K., & Bjørnskov, C. (2014). Exploiting the poor: Bureaucratic corruption and poverty in Africa. *World Development*, 58, 106-115.
- Knack, S. (2007). Measuring Corruption: A Critique of Indicators in Eastern Europe and Central Asia. *Journal of Public Policy*, 27(3), 255-291.
- Kohlberg, L. (1969). Stage and Sequence: the Cognitive-Developmental Approach to Socialization. In D. A. Goslin, *Handbook of Socialization and Endash; Theory and research*. Chicago: McNally.
- Lambsdorff, J. G. (2003). How corruption affects persistent capital flows. *Economics of Governance*, 4(3), 229-243.
- Lambsdorff, J. G. (2005). Causes and consequences of corruption: What do we know from a cross-section of countries? In S. Rose-Ackerman, *International Handbook on the Economics of Corruption* (pp. 3-51). Cheltenham, UK: Edward Elgar Publishing Limited.
- Lee, W.-S., & Guven, C. (2013). Engaging in corruption: The influence of cultural values. *Journal of Economic Psychology*, 39, 287-300.
- Leff, N. H. (1964). Economic Development through Bureaucratic Corruption. *American Behavioural Scientist*, 8(3), 8-14.
- Marshall, M. G. (2014). Polity IV Project: Political Regime Characteristics and Transitions, 1800-2013. Retrieved July 5, 2015, from <http://www.systemicpeace.org/inscrdata.html>
- Mauro, P. (1995). Corruption and Growth. *The Quarterly Journal of Economics*, 110(3), 681-712.
- Mauro, P. (1998). Corruption and the composition of government expenditure. *Journal of Public Economics*, 69(2), 263-279.
- Meon, P.-G., & Sekkat, K. (2005). Does corruption grease or sand the wheels of growth? *Public Choice*, 122, 69-97.

- Mocan, N. (2008). What determines corruption? International evidence from microdata. *Economic Inquiry*, 46(4), 493-510.
- Nelson, J. (2015). Are Women Really More Risk-Averse than Men? A Re-Analysis of the Literature Using Expanded Methods. *Journal of Economic Surveys*, 29(3), 566-585.
- OECD Development Centre. (2014). SIGI Methodological Background Paper.
- Olken, B. A. (2006). Corruption and the costs of redistribution: Micro evidence from Indonesia. *Journal of Public Economics*, 90(4-5), 853-870.
- Olken, B. A. (2009). Corruption perceptions vs. corruption reality. *Journal of Public Economics*, 93(7), 950-964.
- Olken, B. A. (2009). Corruption perceptions vs. corruption reality. *Journal of Public Economics*, 93(7), 950-964.
- Pardo, I. (2004). *Between Morality and the Law: Corruption, Anthropology and Comparative Society*. Aldershot: Ashgate Publishing.
- R.E., K. (1988). *Controlling Corruption*. Berkeley: university of California Press.
- Razafindrakoto, M., & Roubaud, F. (2010). Are International Databases on Corruption Reliable? A Comparison of Expert Opinion Surveys and Household Surveys in Sub-Saharan Africa. *World Development*, 38(8), 1057-1069.
- Reinikka, R., & Svensson, J. (2006). Using Micro-Surveys to Measure and Explain Corruption. *World Development*, 34(2), 359-370.
- Rivas, F. (2013). An experiment on corruption and gender. *Bulletin of Economic Research*, 65(1), 10-42.
- Rizzo, H., Abdel-Latif, A.-H., & Meyer, K. (2007). The relationship between gender equality and democracy: A comparison of Arab versus non-Arab muslim societies. *Sociology*, 4(6), 1151-1170.
- Rose-Ackerman, S. (1975). The economics of corruption. *Journal of public Economics*, 4(2), 187-203.
- Rosener, J. B. (1990). Ways Women Lead. *Harvard Business Review*, 68(6), 119-125.
- Ryvkin, D., & Serra, D. (2011). How corruptible are you? Bribery under uncertainty. *Journal of Economic Behavior & Organization*, 81, 466-477.
- Schulze, G. G., & Frank, B. (2003). Deterrence versus intrinsic motivation: Experimental evidence on the determinants of corruptibility. *Economics of Governance*, 4(2), 143-160.
- Seligson, M. A. (2006). The Measurement and Impact of Corruption Victimization: Survey Evidence from Latin America. *World Development*, 34(2), 381-404.

- Serra, D. (2005). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126, 225-256.
- Serra, D., & Wantchekon, L. (2012). Experimental Research on Corruption: Introduction and Overview. In *New advances in experimental research on corruption, research in experimental economics 15* (pp. 1-11).
- Shleifer, A., & Vishny, R. W. (1993). Corruption. *The Quarterly Journal of Economics*, 108(3), 599-617.
- Sung, H.-E. (2003). Fairer sex or fairer system? Gender and corruption revisited. *Social Forces*, 82(2), 703-723.
- Sung, H.-E. (2012). Women in government, public corruption, and liberal democracy: a panel analysis. *Crime, Law and Social Change*, 58, 195-219.
- Swamy, A., Knack, S., Lee, Y., & Azfar, O. (2001). Gender and Corruption. *Journal of development economics*, 64(1), 25-55.
- Svensson, J. (2003). Who Must Pay Bribes and How Much? Evidence from a Cross Section of Firms. *The Quarterly Journal of Economics*, 118(1), 207-230.
- Svensson, J. (2005). Eight Questions about Corruption. *The Journal of Economic Perspectives*, 19(3), 19-42.
- Søreide, T. (2006). Corruption in international business transactions: the perspective of Norwegian firms. In S. Rose-Ackerman, *International Handbook on the Economics of Corruption* (pp. 381-417). Cheltenham: Edward Elgar.
- Søreide, T. (2009). Too risk averse to stay honest?: Business corruption, uncertainty and attitudes toward risk. *International Review of Law and Economics*, 29(4), 388-395.
- Torgler, B., & Valev, N. T. (2006). Corruption and age. *Journal of Bioeconomics*, 8(2), 133-145.
- Tourangeau, R., & Yan, T. (2007). Sensitive Questions in Surveys. *Psychological Bulletin*, 133(5), 859-883.
- Transparency International. (2010). *Global Corruption Barometer 2010*.
- Transparency International. (2013). *Global Corruption Barometer 2013*.
- Treisman, D. (2000). The causes of corruption: a cross-national study. *Journal of Public Economics*, 76, 399-457.
- Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research? *Annu. Rev. Polit. Sci.*, 10, 211-244.
- Truex, R. (2010). Corruption, Attitudes, and Education: Survey Evidence from Nepal. *World Development*, 39(7).

- Waithima, A. K. (2011). The role of gender, ethnicity and harambee in corruption: Experimental evidence from Kenya. *Doctoral dissertation*. University of Cape Town.
- Weber Abramo, C. (2008, February 12). How much do perceptions of corruption really tell us? *Economics: The Open-Access, Open-Assessment E-Journal*, 2(3), 1-56.
- Wei, S.-J. (1997, November). Why is corruption so much more taxing than tax? Arbitrariness kills. *NBER Working Paper Series*. National Bureau of Economic Research.
- Wei, S.-j. (2000). How Taxing is Corruption on International Investors? *The Review of Economics and Statistics*, 82(1), 1-11.
- Verbeek, M. (2008). *A guide to modern econometrics*. John Wiley & Sons.
- Vijayalakshmi, V. (2008). Rent-Seeking and Gender in Local Governance. *Journal of Development Studies*, 44(9), 1262-1288.
- World Bank. (2001). *Engendering Development through Gender Equality in Rights, Resources*. Oxford: Oxford University Press.
- World Bank. (2013, December 19). Retrieved from World Bank Press Releases: <http://www.worldbank.org/en/news/press-release/2013/12/19/corruption-developing-countries-world-bank-group-president-kim>
- World Bank. (2015, October). *Worldwide Governance Indicators*. Retrieved from <http://databank.worldbank.org/data/databases/>
- Hlavac, Marek (2015). stargazer: Well-Formatted Regression and Summary Statistics Tables. R package version 5.2. <http://CRAN.R-project.org/package=stargazer>
- Henningsen, Arne and Toomet, Ott (2011). maxLik: A package for maximum likelihood estimation in R. *Computational Statistics* 26(3), 443-458. DOI 10.1007/s00180-010-0217-1.

Appendix 1: GCB 2013 survey summary statistics

The table below describes the countries included in the Global Corruption Barometer 2013 round, the organization that conducted the interviews, the size of the sample for each country, the methodology used in each country and description of the coverage of population included in the sample.

The three methodologies are abbreviated as follows:

F2F: Face to face

CATI: Computer Assisted Telephone Interviewing

Online: Questionnaires filled in electronically online

COUNTRY/territory	COMPANY	SAMPLE	METHOD	COVERAGE
Afghanistan	Ascor	2040	F2F	National
Albania	BBSS	999	F2F	National
Algeria	BJ Consult	1000	F2F	National
Argentina	Ibope	1001	CATI	National
Armenia	MPG LLC	1068	F2F	National
Australia	Colmar Brunton	1206	Online	National
Azerbaijan	SIAR	1001	CATI	National
Bangladesh	TI-Bangladesh	1822	F2F	National
Belgium	iVox	1000	Online	National
Bolivia	Ibope	1000	F2F	National
Bosnia and Herzegovina	Mareco Index Bosnia	2000	F2F	National
Brazil	Ibope	2002	F2F	National
Bulgaria	BBSS	1002	F2F	National
Burundi	Infinite Insight	1000	F2F	National
Cambodia	Indochina Research	1000	F2F	National
Cameroon	RMS Africa	1055	F2F	National
Canada	Leger Marketing	1000	Online	National
Chile	Ibope	1000	CATI	Urban
Colombia	Sigma Dos	1001	F2F	National
Croatia	BBSS	1000	F2F	National
Cyprus	TI-Cyprus	570	Online	National
Czech Republic	Mareco	1000	F2F	National
Democratic Republic of the Congo	RMS Africa	1062	F2F	Urban
Denmark	DMA Research	1007	Online	National
Egypt	REACH	1000	F2F	National
El Salvador	Sigma Dos	1000	F2F	National
Estonia	RAIT	1000	F2F	National
Ethiopia	Reach	1000	F2F	National

Fiji	Tebbutt Research	1000	CATI	National
Finland	Taloustukimus	974	F2F	National
France	BVA	1009	Online	National
Georgia	IPM	1000	F2F	National
Germany	Produkt + Markt	1000	Online	National
Ghana	TI-Ghana	2207	F2F	National
Greece	Alternative Research	1001	CATI	National
Hungary	Mareco	1000	CATI	National
India	Dataprompt	1025	CATI	National
Indonesia	Deka	1000	F2F	National
Iraq	IIACSS	1113	F2F	Urban
Israel	Brandman	1004	Online	National
Italy	Doxa	1010	F2F	National
Jamaica	Dichter & Neira	1003	F2F	National
Japan	NRC	1200	F2F	National
Jordan	Reach	1000	CATI	National
Kazakhstan	Romir	1000	CATI	National
Kenya	TI-Kenya	1121	F2F	National
Korea (South)	Gallup Korea	1500	F2F	National
Kosovo	BBSS	998	F2F	National
Kyrgyzstan	Romir	1000	F2F	Urban (8 cities)
Latvia	RAIT	1054	F2F	National
Lebanon	Reach	1000	CATI	National
Liberia	RMS Africa	1028	F2F	National
Libya	Reach	1000	CATI	National
Lithuania	RAIT	1007	F2F	National
Luxembourg	TNS	502	Online	National
Macedonia (FYR)	Brima	1010	CATI	National
Madagascar	ATW Consultants	1049	F2F	National
Malawi	Infinite Insight	1000	F2F	National
Malaysia	TNS Malaysia	1000	F2F	National
Maldives	SRGB	1002	CATI	Urban
Mexico	Ibope	1052	F2F	Urban
Moldova	BBSS	1211	F2F	National
Mongolia	TI-Mongolia	1000	F2F	National
Morocco	BJ Consult	1004	F2F	National
Mozambique	GSC Research	1086	F2F	National
Nepal	SRG Bangladesh Ltd (SRGB)	1001	F2F and CATI	National (major regions)
New Zealand	Colmar Brunton	1000	Online	National
Nigeria	Infinite Insight	1002	F2F	National
Norway	CMA Research	1005	Online	National
Pakistan	Gallup Pakistan	2451	F2F	National
Palestine	PCPO	1039	F2F	National
Papua New Guinea	Tebbutt Research	1044	CATI	National

Paraguay	Ibope	1000	CATI	National
Peru	Datum	1211	F2F	National
Philippines	PSRC	1000	F2F	National
Portugal	Marktest	1003	CATI	National
Romania	CSOP	1143	F2F	National
Russia	Romir	1000	F2F	National
Rwanda	TI-Rwanda	1000	F2F	National
Senegal	RMS Africa	1054	F2F	National
Serbia	TNS Medium Gallup	1011	F2F	National
Sierra Leone	RMS Africa	1028	F2F	National
Slovakia	Mareco	1000	F2F	National
Slovenia	BBSS	1003	CATI	National
Solomon Islands	Tebbutt Research	509	CATI	National
South Africa	TRS	1000	F2F	Urban
South Sudan	Reach	1000	F2F	Urban
Spain	Instituto DYM	1009	F2F	National
Sri Lanka	Gallup Pakistan	1001	F2F	National
Sudan	Reach	1000	CATI	National
Switzerland	Isopublic	1004	Online	National
Taiwan	Cass Research Centre	1000	Online	National
Tanzania	Infinite Insight	1001	F2F	Urban + Rural
Thailand	InfoSearchco.Ltd	1000	F2F	National
Tunisia	Emrhod	1000	F2F	National
Turkey	Barem	1027	CATI	National
Uganda	Infinite Insight	1000	F2F	Urban
Ukraine	Romir	1200	F2F	National
United	ORB	1000	Online	National
United	Leger USA	1000	Online	National
Uruguay	Ibope Inteligencia	1010	CATI	National
Vanuatu	Tebbutt Research	505	CATI	National
Venezuela	Sigma Dos	1000	F2F	Urban
Vietnam	Indochina Research	1000	F2F	National
Yemen	Reach	1000	F2F	National
Zambia	TRS	1003	F2F	National
Zimbabwe	TI-Zimbabwe	1000	F2F	National

Appendix 2: Summary table of the variables

Variable code	Survey question and variable coding	Source	N	Mean	St. Dev.	Min	Max
Dependent variables							
Contact with officials	Q7. A. 1-8. <i>In the past 12 months, have you or anyone living in your household had a contact or contacts with one of the following?</i> Variable coding binary: 1="Yes" to any sub-question	Transparency International Global Corruption Barometer (TI GCB), round 2013	113 270	0.745	0.436	0	1
Bribe paid	Q7. B. 1-8. <i>If yes to Q7A, in your contact or contacts have you or anyone living in your household paid a bribe in any form in the past 12 months?</i> Variable coding binary: 1="Yes" to any sub-question	TI GCB, round 2013	84 361	0.306	0.461	0	1
Bribe requested	Q12. A. <i>Have you ever been asked to pay a bribe?</i> Variable coding binary: 1="Yes"	TI GCB, round 2013	113 268	0.331	0.471	0	1
Bribe payment refused	Q12. B. <i>If yes, have you ever refused to pay a bribe?</i> Variable coding binary: 1="Yes"	TI GCB, round 2013	37 501	0.624	0.484	0	1
Explanatory variables							
Female	D5. Gender. Binary (0-1): 1=Female	TI GCB, round 2013	113 270	0.498	0.500	0	1
Discrimination	Index. Constructed index is unweighted average of a non-linear function of the sub-indices 'Restricted resources and assets' and 'Restricted civil liberties'	OECD Development Centre's Social Institutions and Gender Index (SIGI) 2014	109 258	0.191	0.174	0.000	0.816
Sample splits							
Democracy	Democratic institutions dominant. Polity score for 2013 greater than or equal to 6	Polity IV Project	113 270	0.655	0.475	0	1
Autocracy	Autocratic institutions dominant. Polity score for 2013 less than 6	Polity IV Project	113 270	0.303	0.459	0	1
High Rule of Law	Rule of law high. World Bank Rule of Law indicator for 2013 equal to or higher than 0	World Bank Worldwide Governance Indicators	113 270	0.353	0.478	0	1
Low Rule of Law	Rule of law low. World Bank Rule of Law indicator for 2013 less than 0	World Bank Worldwide Governance Indicators	113 270	0.638	0.481	0	1

Control variables							
Urban	D1. Binary (0-1): 1=Urban	TI GCB, round 2013	109 817	0.597	0.490	0	1
Age under 25	D5. Age Category. Binary (0-1): 1=Under 25	TI GCB, round 2013	109 573	0.194	0.396	0	1
Age 51-65	D5. Age Category. Binary (0-1): 1=51-65	TI GCB, round 2013	109 573	0.178	0.382	0	1
Age 65+	D5. Age Category. Binary (0-1): 1=65+	TI GCB, round 2013	109 573	0.066	0.248	0	1
Unemployed	D8. Employment. Binary (0-1): 1=Unemployed	TI GCB, round 2013	111 763	0.110	0.313	0	1
Not working	D8. Employment. Binary (0-1): 1=Not Working (student, housewife, retired)	TI GCB, round 2013	111 763	0.302	0.459	0	1
Secondary education	D7. Education: Highest attained Binary (0-1): 1=	TI GCB, round 2013	113 264	0.201	0.401	0	1
Higher education	D7. Education: Highest attained Binary (0-1): 1=	TI GCB, round 2013	113 264	0.435	0.496	0	1
Income 2	D6. Total household income before taxes by quintile. Binary (0-1): 1=Medium low – second quintile	TI GCB, round 2013	113 263	0.233	0.423	0	1
Income 3	D6. Total household income before taxes by quintile. Binary (0-1): 1=Medium – third quintile	TI GCB, round 2013	113 263	0.341	0.474	0	1
Income 4	D6. Total household income before taxes by quintile. Binary (0-1): 1=Medium high – fourth quintile	TI GCB, round 2013	113 263	0.128	0.334	0	1
Income 5	D6. Total household income before taxes by quintile. Binary (0-1): 1=High – top quintile	TI GCB, round 2013	113 263	0.068	0.251	0	1
Country	Factor variable: Country of residence of the respondent	TI GCB, round 2013	113 270	N/A	N/A	N/A	N/A

Appendix 3: Pairwise correlations of independent variables

	Female	Age under 25	Age 51-65	Age 65+	Secondary education	Higher education	Income 2	Income 3	Income 4	Income 5	Not working	Unemployed	Urban
Female	NA	0.60229	0.03728	0.75451	0.00000	0.00007	0.02389	0.00384	0.00000	0.00000	0.00000	0.00709	0.03917
Age under 25	0.00155	NA	0.00000	0.00000	0.00000	0.00000	0.39431	0.00012	0.00573	0.00000	0.00000	0.00000	0.00324
Age 51-65	0.00619	-0.22810	NA	0.00000	0.00000	0.00456	0.55966	0.00000	0.01194	0.00000	0.00000	0.00000	0.00000
Age 65+	-0.00093	-0.13031	-0.12331	NA	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Secondary education	0.01625	-0.03573	0.03944	0.07472	NA	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Higher education	-0.01186	0.07154	-0.00843	-0.04308	-0.43984	NA	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.05472
Income 2	0.00671	-0.00253	-0.00173	0.01713	0.08016	0.01850	NA	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000
Income 3	-0.00859	0.01144	-0.02815	-0.04514	-0.05206	0.04845	-0.39645	NA	0.00000	0.00000	0.00000	0.00000	0.00011
Income 4	-0.02353	-0.00821	-0.00747	-0.03741	-0.09572	-0.02432	-0.21081	-0.27507	NA	0.00000	0.00000	0.00000	0.00000
Income 5	-0.02517	-0.01870	0.01478	-0.01830	-0.08300	-0.04323	-0.14842	-0.19367	-0.10298	NA	0.00000	0.00000	0.00000
Not working	0.21561	0.16754	0.06334	0.27460	0.05421	0.02274	0.01356	-0.02600	-0.04005	-0.03415	NA	0.00000	0.33595
Unemployed	-0.00800	0.05995	-0.02637	-0.04302	0.03034	0.02234	0.01340	-0.04996	-0.05489	-0.05607	-0.23081	NA	0.00000
Urban	0.00613	-0.00875	0.01594	0.02082	-0.07330	-0.00571	-0.03435	-0.01151	0.05363	0.08449	-0.00286	-0.01585	NA

Note. Cell entries are standardized Pearson correlations. The figures below the diagonal represent the correlation values. The figures above the diagonal represent the p-values. See Appendix 2 for detailed description of variables. There are both positive and negative correlations.

Appendix 4: Full probit regression result tables for full sample with control variables shown

Dependent variables 1 and 2

	<i>Dependent variable:</i>			
	Contact with officials	Bribe paid	Contact with officials	Bribe paid
Female	-0.031 (0.020)	-0.132*** (0.020)	0.021 (0.024)	-0.111*** (0.031)
Age under 25	-0.020 (0.021)	-0.013 (0.022)	-0.017 (0.021)	-0.006 (0.022)
Age 51-65	-0.036 (0.023)	-0.069*** (0.023)	-0.037 (0.023)	-0.077*** (0.023)
Age 65+	-0.078* (0.043)	-0.155*** (0.043)	-0.070 (0.042)	-0.152*** (0.044)
Secondary education	-0.175*** (0.044)	-0.048 (0.031)	-0.170*** (0.046)	-0.047 (0.032)
Higher education	-0.122*** (0.033)	-0.051** (0.022)	-0.112*** (0.030)	-0.051** (0.023)
Income 2	0.051** (0.025)	0.069*** (0.026)	0.055** (0.025)	0.080*** (0.026)
Income 3	0.077** (0.033)	0.058* (0.032)	0.088*** (0.032)	0.071** (0.032)
Income 4	0.157*** (0.035)	0.130*** (0.033)	0.169*** (0.034)	0.137*** (0.034)
Income 5	0.186*** (0.044)	0.199*** (0.048)	0.186*** (0.045)	0.177*** (0.049)
Not working	0.017	-0.080***	0.014	-0.091***

	(0.025)	(0.028)	(0.025)	(0.025)
Unemployed	-0.083** (0.034)	0.036 (0.041)	-0.079** (0.034)	0.016 (0.037)
Urban	0.011 (0.036)	-0.040 (0.035)	0.008 (0.037)	-0.045 (0.036)
Female:Discrimination			-0.253** (0.110)	-0.094 (0.113)
Constant	0.729*** (0.032)	0.304*** (0.030)	0.728*** (0.031)	0.306*** (0.032)

Observations	104,615	78,640	100,603	75,139
Log Likelihood	-36,128.160	-39,514.340	-34,766.170	-37,544.670
Akaike Inf. Crit.	72,482.320	79,230.680	69,750.330	75,283.350

Note:

* p<0.1; ** p<0.05; *** p<0.01

Dependent variables 3 and 4

Dependent variable:

	Bribe requested	Bribe payment refused	Bribe requested	Bribe payment refused
Female	-0.250*** (0.021)	0.005 (0.020)	-0.251*** (0.028)	0.047* (0.025)
Age under 25	-0.148*** (0.022)	0.012 (0.027)	-0.145*** (0.023)	0.008 (0.028)
Age 51-65	-0.025 (0.023)	0.005 (0.030)	-0.025 (0.023)	-0.005 (0.030)
Age 65+	-0.141*** (0.040)	0.055 (0.050)	-0.133*** (0.040)	0.052 (0.050)
Secondary education	-0.150***	-0.197***	-0.152***	-0.188***

	(0.034)	(0.042)	(0.035)	(0.043)
Higher education	-0.062*** (0.020)	-0.095*** (0.030)	-0.066*** (0.020)	-0.090*** (0.030)
Income 2	0.062*** (0.021)	-0.003 (0.034)	0.070*** (0.022)	-0.015 (0.034)
Income 3	0.102*** (0.026)	-0.002 (0.029)	0.110*** (0.027)	-0.007 (0.030)
Income 4	0.187*** (0.031)	0.010 (0.035)	0.187*** (0.031)	0.002 (0.036)
Income 5	0.255*** (0.045)	0.052 (0.040)	0.238*** (0.045)	0.052 (0.041)
Not working	-0.144*** (0.026)	-0.045 (0.033)	-0.149*** (0.025)	-0.042 (0.034)
Unemployed	0.011 (0.036)	0.055 (0.042)	-0.002 (0.033)	0.051 (0.044)
Urban	0.009 (0.028)	0.076* (0.041)	0.008 (0.029)	0.076* (0.041)
Female:Discrimination			-0.002 (0.097)	-0.150** (0.076)
Constant	-0.017 (0.028)	0.241*** (0.032)	-0.015 (0.029)	0.244*** (0.033)

Observations	104,615	36,408	100,603	35,237
Log Likelihood	-53,223.430	-22,873.090	-51,028.320	-22,100.060
Akaike Inf. Crit.	106,672.900	45,972.170	102,274.600	44,418.120

Note:

* p<0.1; ** p<0.05; *** p<0.01

Appendix 5: Robustness check with OLS estimation

Complete sample

Dependent variables 1 and 2

	<i>Dependent variable:</i>			
	Contact with officials	Bribe paid	Contact with officials	Bribe paid
Female	-0.005 (0.004)	-0.038*** (0.006)	0.004 (0.005)	-0.025*** (0.009)
Female:Discrimination			-0.047** (0.019)	-0.067* (0.038)
Constant	0.769*** (0.006)	0.617*** (0.009)	0.768*** (0.006)	0.619*** (0.009)
Observations	104,615	78,640	100,603	75,139
R ²	0.430	0.226	0.436	0.231
Adjusted R ²	0.429	0.225	0.436	0.230
Residual Std. Error	0.326 (df = 104503)	0.411 (df = 78540)	0.327 (df = 100495)	0.410 (df = 75043)
F Statistic	709.186*** (df = 111; 104503)	230.986*** (df = 99; 78540)	726.425*** (df = 107; 100495)	237.705*** (df = 95; 75043)

Note:

* p<0.1; ** p<0.05; *** p<0.01

Dependent variables 3 and 4

	<i>Dependent variable:</i>			
	Bribe requested	Bribe payment refused	Bribe requested	Bribe payment refused

Female	-0.072*** (0.007)	0.001 (0.007)	-0.063*** (0.008)	0.016* (0.009)
Female:Discrimination			-0.046 (0.036)	-0.053** (0.027)
Constant	0.484*** (0.008)	0.592*** (0.011)	0.486*** (0.009)	0.594*** (0.012)
Observations	104,615	36,408	100,603	35,237
R ²	0.252	0.067	0.257	0.068
Adjusted R ²	0.251	0.064	0.256	0.065
Residual Std. Error	0.412 (df = 104503)	0.469 (df = 36296)	0.412 (df = 100495)	0.469 (df = 35129)
F Statistic	316.888*** (df = 111; 104503)	23.584*** (df = 111; 36296)	324.044*** (df = 107; 100495)	23.953*** (df = 107; 35129)

Note:

* p<0.1; ** p<0.05; *** p<0.01

Sample splits by institutions

Contact with officials

Dependent variable:

	Contact with officials							
	High rule of law		Low rule of law		Democracy		Autocracy	
Female	0.005 (0.005)	0.017*** (0.006)	-0.011** (0.005)	-0.006 (0.007)	-0.001 (0.005)	0.005 (0.005)	-0.014* (0.008)	-0.002 (0.011)
Female:Discrimination		-0.098* (0.053)		-0.019 (0.020)		-0.026* (0.015)		-0.048 (0.037)
Constant	0.792*** (0.010)	0.785*** (0.012)	0.773*** (0.009)	0.771*** (0.008)	0.001 (0.009)	0.001 (0.009)	0.771*** (0.011)	0.767*** (0.011)

Observations	34,804	33,299	68,772	66,265	65,667	63,160	34,197	33,197
R ²	0.357	0.362	0.470	0.478	0.462	0.471	0.409	0.417
Adjusted R ²	0.356	0.361	0.470	0.477	0.462	0.470	0.408	0.416
Residual Std. Error	0.336 (df = 34757)	0.338 (df = 33253)	0.318 (df = 68694)	0.318 (df = 66189)	0.323 (df = 65591)	0.322 (df = 63086)	0.320 (df = 34152)	0.319 (df = 33152)
F Statistic	419.000** (df = 46; 34757)	419.000** (df = 45; 33253)	792.000** (df = 77; 68694)	808.000** (df = 75; 66189)	752.000** (df = 75; 65591)	769.000** (df = 73; 63086)	538.000** (df = 44; 34152)	539.000** (df = 44; 33152)

Note:

*p<0.1; **p<0.05; ***p<0.01

Bribe paid

Dependent variable:

	Bribe paid							
	High rule of law		Low rule of law		Democracy		Autocracy	
Female	-0.014** (0.006)	0.002 (0.004)	-0.052*** (0.009)	-0.051*** (0.014)	-0.035*** (0.009)	-0.018** (0.007)	-0.054*** (0.011)	-0.029 (0.018)
Female:Discrimination		-0.149*** (0.013)		0.002 (0.046)		-0.126** (0.058)		-0.084* (0.043)
Constant	0.026*** (0.009)	0.019* (0.010)	0.610*** (0.013)	0.609*** (0.013)	0.185*** (0.013)	0.180*** (0.013)	0.592*** (0.014)	0.592*** (0.015)
Observations	26,908	25,557	51,060	48,910	48,431	46,295	26,587	25,727
R ²	0.198	0.204	0.171	0.172	0.266	0.275	0.102	0.105
Adjusted R ²	0.197	0.203	0.170	0.171	0.265	0.274	0.101	0.104
Residual Std. Error	0.331 (df = 26864)	0.325 (df = 25514)	0.448 (df = 50991)	0.448 (df = 48843)	0.377 (df = 48364)	0.374 (df = 46230)	0.471 (df = 26545)	0.470 (df = 25685)
F Statistic	154.000** (df = 43; 26864)	156.000** (df = 42; 25514)	154.000** (df = 68; 50991)	154.000** (df = 66; 48843)	265.000** (df = 66; 48364)	274.000** (df = 64; 46230)	73.900** (df = 41; 26545)	73.700** (df = 41; 25685)

Note:

*p<0.1; **p<0.05; ***p<0.01

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Bribe requested

		<i>Dependent variable:</i>							
		Bribe requested							
		High rule of law	Low rule of law	Democracy	Autocracy				
Female		-0.057*** (0.009)	-0.037*** (0.007)	-0.081*** (0.009)	-0.084*** (0.013)	-0.070*** (0.009)	-0.068*** (0.009)	-0.086*** (0.011)	-0.046*** (0.015)
Female:Discrimination			-0.216*** (0.042)	0.016 (0.036)		-0.022 (0.058)		-0.143*** (0.045)	
Constant		0.078*** (0.009)	0.067*** (0.008)	0.475*** (0.012)	0.475*** (0.012)	0.797*** (0.012)	0.798*** (0.012)	0.471*** (0.015)	0.472*** (0.016)
Observations		34,804	33,299	68,772	66,265	65,667	63,160	34,197	33,197
R ²		0.170	0.179	0.206	0.209	0.302	0.308	0.139	0.143
Adjusted R ²		0.169	0.178	0.205	0.208	0.301	0.308	0.138	0.142
Residual Std. Error		0.347 (df = 34757)	0.345 (df = 33253)	0.442 (df = 68694)	0.442 (df = 66189)	0.387 (df = 65591)	0.386 (df = 63086)	0.459 (df = 34152)	0.458 (df = 33152)
F Statistic		155.000* ** (df = 46; 34757)	161.000* ** (df = 45; 33253)	231.000* ** (df = 77; 68694)	233.000* ** (df = 75; 66189)	378.000* ** (df = 75; 65591)	385.000* ** (df = 73; 63086)	125.000* ** (df = 44; 34152)	126.000* ** (df = 44; 33152)

Note:

*p<0.1; **p<0.05; ***p<0.01

Bribe payment refused

		<i>Dependent variable:</i>							
		Bribe payment refused							

	High rule of law		Low rule of law		Democracy		Autocracy							
Female	0.002 (0.016)	-0.010 (0.023)	0.001 (0.008)	0.023** (0.009)	0.009 (0.010)	0.017* (0.010)	-0.008 (0.010)	0.014 (0.017)						
Female:Discrimination		0.091* (0.053)		-0.075*** (0.029)		-0.029 (0.046)		-0.078** (0.038)						
Constant	0.873** * (0.032)	0.881** * (0.034)	0.592*** (0.013)	0.594*** (0.013)	0.803*** (0.021)	0.805*** (0.021)	0.575*** (0.015)	0.575*** (0.015)						
Observations	6,115	5,842	30,189	29,291	20,428	19,820	14,656	14,171						
R ²	0.066	0.069	0.065	0.066	0.081	0.082	0.040	0.041						
Adjusted R ²	0.059	0.061	0.063	0.064	0.077	0.079	0.037	0.038						
Residual Std. Error	0.455 (df = 6068)	0.456 (df = 5796)	0.472 (df = 30111)		0.471 (df = 29215)		0.459 (df = 20352)		0.458 (df = 19746)		0.485 (df = 14611)		0.485 (df = 14126)	
F Statistic	9.390** * (df = 46; 6068)	9.500** * (df = 45; 5796)	27.400** * (df = 77; 30111)	27.700** * (df = 75; 29215)	23.900** * (df = 75; 20352)	24.200** * (df = 73; 19746)	13.900** * (df = 44; 14611)	13.600** * (df = 44; 14126)						

Note:

* p<0.1; ** p<0.05; *** p<0.01