WHAT DETERMINES CORRUPTION? INTERNATIONAL EVIDENCE FROM MICRODATA

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This paper uses a microlevel data set from 49 countries to create a direct measure of corruption, which portrays the extent of bribery as revealed by individuals who live in those countries. In addition, it investigates the determinants of being asked for a bribe at the individual level. The results show that both personal and country characteristics determine the risk of exposure to bribery. Examples are gender, income, education, marital status, the city size, the country's unemployment rate, average education, and the strength of the institutions in the country. (*JEL* K4, D73 P16)

I. INTRODUCTION

A sizable literature has emerged recently to examine factors that impact the level of corruption across countries. For example, Ades and Di Tella (1999) found that corruption is higher in countries where domestic firms are sheltered from foreign competition. Graeff and Mehlkop (2003) documented the relationship between a country's economic freedom and its level of corruption. Brunetti and Weder (2003) found that higher freedom of the press is associated with less corruption. Van Rijckeghem and Weder (2001) showed that the higher the ratio of government wages to manufacturing wages, the lower is corruption in a country.[1]

The current research on corruption has two common characteristics. First, it exclusively relies on *subjective* measures of corruption. Specifically, it employs various indexes of *corruption perception* based on the surveys of international business people, expatriates, risk analysts, and local residents. The use of a corruption perception index is justified because the actual level of corruption in a country is difficult to observe. Certain potential measures of corruption, such as the number of prosecuted corruption-related cases in a country, may be rather noisy measures. For example, a low arrest rate for bribery may indicate a low prevalence of corruption or it may indicate widespread corruption with no prevention efforts.

Second, because corruption data are available only at the aggregate (country) level, existing research has focused on explaining the cross-country variation in corruption. Two exceptions are Swamy et al. (2001) and Svensson (2003). Swamy et al. (2001) used microdata where respondents answered questions on *hypothetical* situations regarding corruption. In the same paper, they analyzed the responses of 350 managers from the Republic of Georgia to a question on the frequency of an official requesting unofficial payments. Svensson (2003) analyzed the bribery behavior of 176 firms in Uganda.

In its benchmark specification, this paper analyzes information obtained from more than 55,000 individuals from 30 countries pertaining to their direct experiences with bribery.

ABBREVIATIONS

BI: Business International
ICRG: International Country Risk Guide
ICVS: International Crime Victim Survery
TI: Transparency International
UNICRI: United Nations Interregional Crime and Justice Research Institute

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1. An increase in perceived corruption in a country is thought to be associated with a slower rate of economic growth (Mauro 1995). Research on the consequences of corruption on other economic outcomes is more limited. An example is Alesina and Weder (2002).

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Specifically, the individuals are asked whether any government official such as a government worker, police officer, or inspector in that country has asked them or expected them to pay a bribe for his services during the previous year. Using these microdata, the paper investigates the determinants of the probability of being asked for a bribe. Following the theoretical arguments put forth by Treisman (2000), this probability is explained by a number of country characteristics. In addition, personal characteristics of the individuals are controlled for, as they are expected to impact the exposure to corruption through the mechanisms discussed in Section II below. The results show that the characteristics of an individual influence his/her propensity of exposure to bribery. For example, males and individuals with higher income and education are more likely to be asked for a bribe. Country characteristics also influence exposure to bribery. Examples are the risk of expropriation, average education, and the unemployment rate in the country.

A second contribution of the paper was to create an aggregate (country level) corruption index using information provided by more than 90,000 individuals in the data set. The index is the proportion of individuals who were asked for a bribe in the country. As such, it is an indicator of the breadth of corruption. This measure of corruption is compared with three widely used corruption perception indices published by Transparency International (TI), Business International (BI), and International Country Risk Guide (ICRG).

II. WHAT DETERMINES CORRUPTION? THEORETICAL CONSIDERATIONS

A. Macrolevel

Treisman (2000) details a number of hypotheses that link the level of corruption in the country to its legal, political, and socioeconomic characteristics. Following his discussion and the literature he cites, it is postulated that at the macrolevel, the following holds:

$$\text{COR}_j = f_1(C_j, \text{Econ}_j), \tag{1}$$

where the extent of corruption in country j (COR_j) depends on cultural attributes (C), as well as the level of economic development of the country (Econ). Economic development, in contrast, is argued to be negatively impacted by the extent of corruption in the country (Mauro 1995). To incorporate this connection, consider Equation (2) where corruption is postulated to have a direct impact on economic development.

$$\text{Econ}_j = f_2(\text{COR}_j, K_j, C_j, H_j). \tag{2}$$

Acemoğlu, Johnson, and Robinson (2001) demonstrate that the quality of institutions in the country, such as secure property rights, has a direct impact on development. Thus, in Equation (2), K represents the institutional characteristics of the country. H stands for standard human capital measures that impact economic development, such as the level of education in the country. Substituting Equation (2) into (1) generates the macrolevel reduced form as follows:

$$\text{COR}_j = f_3(C_j, H_j, K_j). \tag{3}$$

B. Microlevel

At the microlevel, a number of formulations can be developed to demonstrate the determinants of corruption. Examples are Kaufmann and Wei (1999), Ades and Di Tella (1999), and Van Rijckeghem and Weder (2001). Similarly, one can consider that the utility of the bribe-receiving government official depends on a composite consumption good, the number of bribes he receives, and the quality of the institutions in the country. Consumption depends on the sum of earned legal income and illegal income. In this framework, it is easy to show that an increase in the income of the potential victim would increase the propensity to ask for a bribe. Alternatively, an increase in the quality of the institutions in the country, which would increase the probability of apprehension, would in turn reduce the propensity to ask for a bribe.[2]

Within this framework I estimate:

$$\text{COR}_{ij} = f(X_{ij}, C_j, H_j, K_j), \tag{4}$$

where COR_{ij} is the propensity of the ith individual who lives in country j to be a victim of

2. In the model of Mookherjee and Png (1995), an increase in penalties may increase the amount of the bribe rather than reduce corruption, and it may take a large, discrete increase in penalties to eliminate bribery.

corruption, X_{ij} represents personal characteristics of the individual, and C_j, K_j, and H_j are the characteristics of the country as described above. The theoretical and empirical research have identified viable candidates for X, C, H, and K, which are described below.

C. Individual-Specific Explanatory Variables

The propensity for being targeted for a bribe is assumed to depend on age, marital status, labor market activity, wealth, education, gender, and the location of the residence of the individual. Because the dependent variable is essentially a measure of "exposure to bribery," individuals in certain age, wealth, and labor market categories may be at a higher risk of being asked for a bribe. For example, all else the same, highly educated and high-income individuals should have higher exposure to being asked for a bribe by a government official because of their higher earning capacity and because they are likely to have more opportunities to interact with government officials. The opposite should be true for the very young and old, as well as home keepers, as they may have less contact with government officials in comparison to prime-age individuals. Males are expected to be more frequent targets of bribery for a number of reasons. First, in most countries, especially in developing countries, males are more active than females in the labor market for various reasons, and therefore, they have more exposure to government officials. Second, all else the same, males have a higher propensity to engage in criminal activity or to have tolerance for illegal activity (Mocan and Rees 2005; Swamy et al. 2001).

In larger cities, the extent of bribery may be higher because economic activity may be larger and more varied in scope, which may increase the contact with government. It can also be argued that the relationship between individuals and government officials may be less personal in larger cities in comparison to smaller ones, which may make it easier to ask for a bribe (Hunt 2004).

D. Country Characteristics

Higher quality institutions are expected to reduce the incidence of being asked for a bribe. The quality of the institutions of the country can be measured in a number of ways such as the independence of the judicial system and the protection of civil liberties. Following Acemoğlu, Johnson, and Robinson (2001), I use the risk of expropriation in the country (the risk of confiscation and forced nationalization of property) as a measure of the quality of the institutions. The structure of institutions is likely to change over the course of development; that is, the protection of property rights might get stronger as the country develops economically. Acemoğlu, Johnson, and Robinson (2001) control for the endogeneity of institutions by using the settler mortality rates in ex-colonies as instruments. Because most countries in our sample are not ex-colonies, in this paper, institutional quality is instrumented by geographic indicators as employed by McArthur and Sachs (2001).

Involvement in a war in recent history may have destabilizing effects, and therefore, it may propagate the incidence of corruption. The level of education in the country is an aggregate measure of the human capital, and it is expected to be negatively related to the incidence of being asked for a bribe as a more educated population is expected to be less tolerant of corruption. The population of the country and the male unemployment rate are included as additional country characteristics.[3]

III. CORRUPTION DATA

The data are collected from a number of sources. The corruption data and the

3. An efficiency wages–based argument suggests that when the wages of government workers are higher relative to their alternative wages, their tendency to be corrupt is lower because the opportunity cost of detection and job loss is higher. If the wages of government employees are relatively rigid and if nongovernment real wages are procyclical over the business cycle, then an increase in the unemployment rate would be associated with an increase in relative wages of government workers. Coupled with the decrease in average income of the target population during the recession, the increase in unemployment would reduce the propensity to ask for a bribe. In contrast, if nongovernment real wages are countercyclical, a recession would be coupled with decreased relative wages of government workers and the impact on the propensity to ask for a bribe could be positive. Cyclical behavior of real wages is still debated (Bils and McLaughlin 2001; Chrinko 1980; Huang, Liu, and Phaneuf 2004; Mocan and Topyan 1993, Rotemberg 2006; Sumner and Silver 1989). In addition, if high unemployment is an indication of structurally high joblessness, and if this is correlated with bad governance and low probability of detection and punishment of bribery, unemployment may be positively correlated with the incidence of corruption. Note that the data set does not allow for a differentiation between structural and cyclical unemployment effects.

corresponding characteristics of the individuals are obtained from the International Crime Victim Survey (ICVS) compiled by the United Nations Inter-regional Crime and Justice Research Institute (UNICRI) (http://www.unicri.it/icvs). Table 1 presents the list of countries included in the analysis.[4] The data are collected through face-to-face and telephone interviews. The corruption measure for each individual is the answer to the question: "*In some areas, there is a problem of corruption among government or public officials. During [the past year] has any government official, for instance a customs officer, police officer or inspector in your own country, asked you or expected you to pay a bribe for his services?*"

Table 1 also displays the number of individuals surveyed in each country, the year of their bribery experience (which is the year before the survey is administered), and the gender-specific means of the dichotomous variable "corruption," which is coded as 1 if the respondent indicated that he/she was asked for a bribe by a government official. As can be seen from the table, females are asked for a bribe less frequently than males in almost every country.

The third column of Table 1 displays country averages, which are the weighted means of the bribery question. Risk of bribery is highest in Indonesia, where 31% of the citizens indicated that they were asked for a bribe. The extent of corruption, measured this way, is 29% in Argentina, 26% in Bolivia, 24% in Uganda, and 21% in India and Kyrgyz Republic. Western European countries have low bribery rates, generally less than 0.5%; and the risk of being asked for a bribe is practically zero in Japan.

There exist three widely used aggregate corruption perception indexes. They are the measures created by TI (http://www.transparency.org/surveys/index.html), by BI (Mauro 1995), and by ICRG (Fisman and Gatti 2002).[5] The TI index ranges from 1 to 10, the BI index ranges from 1 to 10, and the ICRG index ranges from 1 to 6, where a higher value represents a lower degree of perceived corruption. Simple correlations between these corruption perception indexes are high, ranging from .71 to .96.

There are two dimensions of corruption: how widespread it is in the country (breadth) and the size of each bribe (depth). The depth of bribery is likely to vary between government agencies. The amount of bribe asked by a licensing office will be different from the amount of bribe asked by a custom's officer. It also depends on whether bribe involves theft (Shleifer and Vishny 1993). The three corruption indexes, which are used in previous literature, are measures of corruption perception. Therefore, it is unclear whether they capture the beliefs about the depth or breadth of corruption or whether they are mixtures of both. In contrast, the index used in this paper is a measure of the breadth of corruption in the country.

Figures 1–3 display the measure created from the data set used in this paper (Average Overall Corruption, Table 1) along with the three subjective corruption perception indexes, where the corruption perception indexes are reversed such that higher values represent higher levels of corruption. For each country, the data are merged with corruption perception indexes by year. For example, as can be seen in Table 1, France is surveyed twice, and individuals are asked about their corruption experiences for the years 1995 and 1999. The TI index is available for both of these years. Therefore, average corruption in France in 1995 (0.007) is matched with the corresponding value of the TI index in 1995, and average corruption in France in 1999 (0.0125) is matched with the value of the TI index for France in 1999. Thus, some countries contribute more than one observation in Figures 1–3.[6] The match is less accurate for the BI and ICRG perception indexes as the versions of these indexes employed here (to match the time period of the corruption index created in this paper) cover the intervals 1980–1983 and 1982–1990, respectively (see Fisman and Gatti 2002; Mauro 1995).

The curves in Figures 1–3 are the predicted values of regressions of perceived corruption indexes on the percentage of individuals who are asked for a bribe (displayed on the horizontal axes). In all cases, a nonlinear relationship is visible, which is especially pronounced in the case of the TI index. Regressions with quadratic terms of corruption provided better fits. This nonlinearity is primarily due to the fact that in a small number of countries, such as Argentina, Bolivia, and Indonesia, citizens have reported high levels

4. Detailed information on country participation in the ICVS is provided in the Appendix.

5. A fourth one is the World Bank index, which is mostly based on TI and ICRG (see Mocan 2004).

6. These countries are the United Kingdom, The Netherlands, Finland, Sweden, France, United States, Canada, and Poland.

TABLE 1
The Incidence of Corruption by Country

Country Name	Year of Activity	Number of Observations	Average Corruption (Overall)	Average Corruption (Male)	Average Corruption (Female)
European countries					
United Kingdom	1995	5,404	0.0025	0.0030	0.0021
United Kingdom	1999	5,513	0.0007	0.0009	0.0005
The Netherlands	1995	2,007	0.0055	0.0082	0.0028
The Netherlands	1999	1,998	0.0040	0.0037	0.0044
Switzerland	1995	1,000	0.0023	0.0040	0.0007
Belgium	1999	2,499	0.0035	0.0049	0.0022
Finland	1995	3,829	0.0013	0.0027	0.0000
Finland	1999	1,780	0.0016	0.0033	0.0000
Sweden	1995	1,000	0.0025	0.0020	0.0029
Sweden	1999	2,001	0.0009	0.0000	0.0018
Austria	1995	1,507	0.0072	0.0126	0.0022
Denmark	1999	3,006	0.0028	0.0053	0.0004
France	1995	1,003	0.0070	0.0126	0.0017
France	1999	997	0.0125	0.0155	0.0097
Spain	1999	2,908	0.0025	0.0015	0.0034
Malta	1996	993	0.0408	0.0467	0.0350
Portugal	1999	1,998	0.0135	0.0182	0.0091
United States, Canada, and Australia					
United States	1995	1,000	0.0027	0.0055	0.0000
United States	1999	999	0.0021	0.0044	0.0000
Canada	1995	2,132	0.0039	0.0043	0.0036
Canada	1999	2,075	0.0039	0.0070	0.0009
Australia	1999	2,003	0.0033	0.0044	0.0021
Central and Eastern European countries					
Estonia	1994	1,153	0.0391	0.0513	0.0257
Poland	1991	1,974	0.0546	0.0734	0.0374
Poland	1995	3,438	0.0480	0.0664	0.0310
Poland	1999	5,194	0.0517	0.0699	0.0350
Czech Republic	1995	1,752	0.0809	0.1040	0.0587
Slovakia	1996	1,091	0.1414	0.1929	0.0940
Russia	1995	1,006	0.1896	0.2545	0.1308
Georgia	1995	1,110	0.2234	0.2887	0.1717
Slovenia	1996	2,046	0.0124	0.0149	0.0095
Latvia	1995	1,380	0.1380	0.1837	0.1051
Romania	1995	1,083	0.1148	0.1535	0.0789
Hungary	1995	746	0.0392	0.0527	0.0275
Yugoslavia	1995	1,089	0.1750	0.2325	0.1198
Albania	1995	1,188	0.1295	0.1378	0.1211
Macedonia	1995	698	0.0775	0.1011	0.0534
Croatia	1996	981	0.1625	0.2046	0.1266
Ukraine	1996	979	0.1287	0.1586	0.1038
Belarus	1996	960	0.1250	0.1623	0.0937
Bulgaria	1996	1,066	0.1932	0.2393	0.1497
Lithuania	1996	1,165	0.1112	0.1659	0.0647
Asian countries					
Japan	1999	2,198	0.0004	0.0000	0.0008
Indonesia	1995	1,338	0.3111	0.3692	0.2526

continued

TABLE 1
Continued

Country Name	Year of Activity	Number of Observations	Average Corruption (Overall)	Average Corruption (Male)	Average Corruption (Female)
Philippines	1995	1,497	0.0437	0.0462	0.0415
India	1995	1,193	0.2119	0.2563	0.1691
Mongolia	1995	1,188	0.0467	0.0559	0.0376
Kyrgyz Republic	1995	1,714	0.2087	0.2951	0.1419
African countries					
Uganda	1995	1,191	0.2372	0.3043	0.1745
South Africa	1995	996	0.0763	0.1235	0.0303
Zimbabwe	1995	1,003	0.0722	0.0969	0.0491
Botswana	1996	638	0.0292	0.0569	0.0052
Latin American countries					
Costa Rica	1995	998	0.0997	0.1449	0.0554
Brazil	1995	1,000	0.1786	0.2763	0.0785
Argentina	1995	996	0.2935	0.3492	0.2408
Bolivia	1995	994	0.2600	0.2989	0.2230
Paraguay	1995	585	0.1386	0.1636	0.1181
Colombia	1996	984	0.1953	0.2397	0.1518

Corruption rates are weighted means of individuals' responses in a country to indicate whether they were asked for a bribe in that country.

of corruption, but the external perception of corruption is relatively low in these cases. Figure 1 also shows that a number of countries have very low levels of bribery, although their perceived corruption seems disproportionately higher than warranted. To be able to accommodate the patterns at the low and high end of the corruption spectrum, I fit a third-order polynomial of corruption. The predicted values from this regression are plotted in Figure 1 as the dotted curve, which are not much different from the ones provided by the quadratic regression.[7]

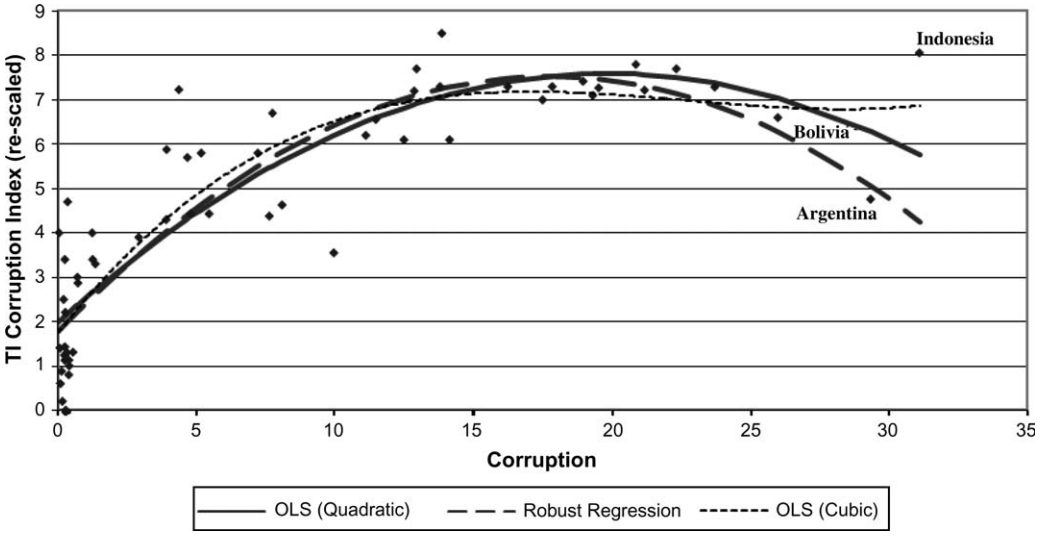
7. A number of other analyses pertaining the relationship between the corruption index of this paper and the perception indices are reported in Mocan (2004). The country-level corruption measure reported in Table 1, and displayed in Figures 1–3, is based on surveys weights in the data. In some poor countries, the survey is focused on capital city, and in some other countries, rural and urban areas as surveyed. Therefore, I also calculated corruption rates using the urban weights, which seems to down-weigh the rural observations in those surveys that cover a whole country. The rank-order correlation between the two measures is . 99, indicating that using urban weights does not alter the relative rankings of the countries. A plot of the two measures along with the 45° line demonstrated that using urban weights does not change significantly the absolute value of the index either. One exception is the country of Georgia, which is significantly off the 45° line. In survey-weighted index, the five highest ranking of countries are Indonesia, Argentina, Bolivia, Uganda, and Georgia. In urban-weighted data, they are Indonesia, Georgia, Argentina, Bolivia, and Uganda.

IV. EMPIRICAL RESULTS

For econometric analyses, missing data pertaining to country-level variables (such as average education and institutional quality) are a problem for some counties, especially for those in Central and Eastern Europe. The countries with complete macrodata are Indonesia, Philippines, Uganda, South Africa, Zimbabwe, Botswana, Brazil, Argentina, Bolivia, Paraguay, Colombia, Costa Rica, United Kingdom, The Netherlands, Switzerland, Belgium, France, Finland, Spain, Sweden, Austria, Portugal, Denmark, United States, Canada, Australia, Poland, Hungary, Japan, and India.[8] Table 2 displays the definitions and the descriptive statistics of the explanatory variables along with their sources. The descriptive statistics pertain to 55,107 individuals from the 30 countries mentioned above with

8. In case of India, there was one missing variable, which was the male unemployment rate for the year 1995. Unemployment rate was not reported for India by the World Bank, World Development Report, which is the data source for other countries' unemployment rate data. In order not to lose the 1,193 observations from India, I used the 7.0% unemployment rate in 1995 for this country, reported by Planning Commission, Government of India, "9th Five Year Plan" (http://planningcommission.nic.in/plans/planrel/fiveyr/default.html)

FIGURE 1
TI Corruption Index versus Corruption in the Country



no missing personal or country-level information. This is the data set used in benchmark microlevel empirical analyses in this section. In some cases, regressions were run with a subset of variables, which used a larger number of observations (up to 73,040 observations).

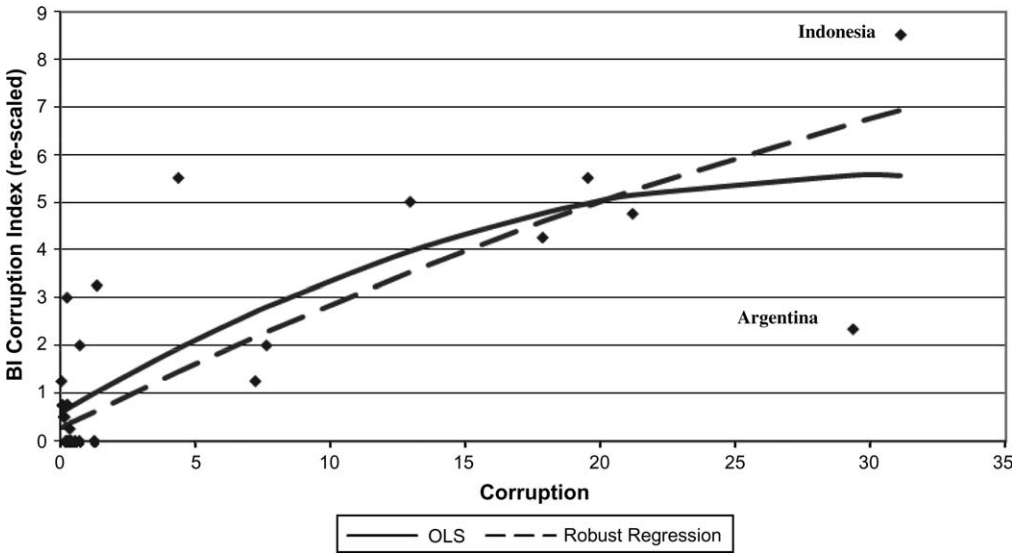
Table 3 presents the results of the estimated probit models, where the dependent variable is one if the respondent indicated that he/she was asked for a bribe in that year and zero otherwise. The model includes time dummies to control for the impact of the year in which the survey is given. Columns 1 and 3 report the marginal effects. The observations are weighted by population weights, and robust and country-clustered standard errors are calculated to account for the fact that the unit of observation is the individual, but country-specific variables vary at the country and not at the individual level. The first panel of the table displays the marginal effects and robust standard errors of the coefficients of personal characteristics of the individual. The second panel displays the same information for country-specific variables. Each regression includes a dichotomous variable to distinguish between face-to-face and phone interviews but excluding this variable had no impact on the results. The specification presented in columns 3 and 4 of Table 3 includes country fixed effects to account for unobserved characteristics that differ between countries. Columns 1 and 2 pertain to the model where the country characteristics discussed earlier are included instead of country fixed effects.

A. The Impact of Personal Characteristics

The results, reported in Table 3, show that males are about 1 percentage point more likely to be asked for a bribe. This is consistent with theoretical predictions summarized in section II, indicating that because males are likely to have more contact with government officials in civil and business life, and because males have higher propensity for illicit activity or tolerance for it (see Mocan and Rees 2005 for a summary), they are expected to have higher exposure to bribery. It is also possibly the case that males are out on the street more frequently, creating more exposure to interaction with government officials. For example, men are more likely to travel as car drivers than females and the difference is larger in developing countries (Hamilton et al. 2005; Turner and Fouracre 1995).[9] Table 3 also shows that individuals who live in smaller cities face a lower propensity of being asked for a bribe, which is

9. I thank an anonymous referee for this insight.

FIGURE 2
BI Corruption Index versus Corruption in the Country



consistent with the idea that living in larger cities increases exposure to bribery possibly because of enhanced opportunities to interact with government officials and because these interactions would be less personal in comparison to those that might be found in smaller cities and towns. As predicted, individuals who are 20–39 years of age are more likely to be asked for a bribe in comparison to those who are younger than 20 yr. Individuals who are 60 yr and older are less likely to get asked for a bribe. Single individuals are at lower risk of being asked for a bribe in comparison to married individuals. These results may suggest that older (possibly retired) individuals and those who are single may have to deal with government rules and regulations less frequently. In contrast, being a home keeper has no statistically significant impact.

Individuals with higher incomes (those who are in the top 50% of the income distribution in the country) are 0.4–0.7 percentage points more likely to be asked for a bribe. Similarly, individuals who are more educated are more likely to be targeted for bribes. These results are also consistent with theoretical predictions discussed earlier in the paper, which indicate that more educated people and people who have higher incomes may have more contact with the government, which exposes them to a higher risk of being asked for a bribe.[10] Adding country attributes (Columns 1 and 2) or adding country dummies (Columns 3 and 4) have very little impact on estimated coefficients of personal characteristics.[11]

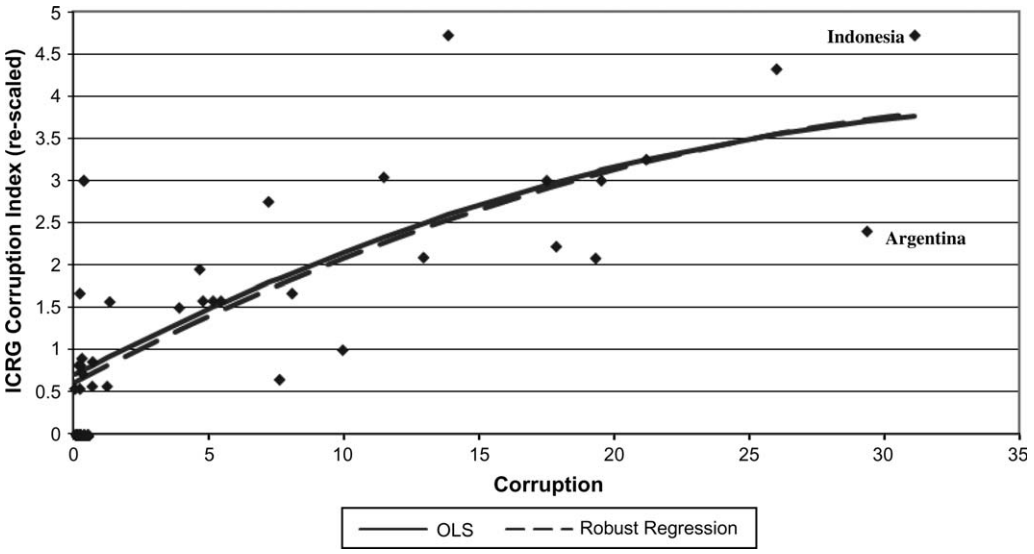
B. Country Characteristics

Following Acemoğlu, Johnson, and Robinson (2001), the quality of the institutions is measured by the risk of expropriation. Table 3 shows that in countries where the risk of expropriation is lower (where the variable *Low Expropriation Risk* takes higher values) the propensity to be asked for a bribe is lower. An improvement of expropriation risk by one standard deviation generates about a 1 percentage point decrease in the propensity to be asked for a bribe. Given that the sample

10. Note that because we do not observe the size of the bribe, we cannot investigate the bribe's relative impact on household income.

11. Note that this specification does not suffer from the typical incidental parameters problem in nonlinear models with fixed effects.

FIGURE 3
ICRG Corruption Index versus Corruption in the Country



mean of corruption is 4.1%, this translates into a 24% decline, which is substantial.

Individuals who live in more populous countries face a higher propensity of corruption. More specifically, an increase in the country's population by 10 million is associated with an increase in the propensity to be asked for a bribe by 0.03 percentage points. Increased joblessness is associated with increased corruption. A 1 percentage point increase in the male unemployment rate in the country increases the risk of bribery by 0.06 percentage points. An increase in average education in the country by 1 yr lowers the risk of bribery for the individuals by about 0.4 percentage points.

The first two columns of Table 4 report the results of the model estimated for developed countries. Columns 3 and 4 of the table display the results for developing counties. The purpose of this analysis is to investigate if the relationship between the risk of bribery and its determinants is structurally different between developed and developing nations. Most of the results are similar between the two groups. In both developed and developing countries, living in a small or midsize city is associated with a reduced risk of being asked for a bribe in comparison to living in large city (with population more than one million). Similarly, males have a higher risk of being asked for a bribe in both developed and developing countries. Although the estimates are different between the two groups, the impacts are similar because the baselines are different. The mean value of the dependent variable among the individuals in the developed countries sample is 0.003, while it is 0.11 in developing countries.[12] Income and education of the individual have positive impacts on the propensity of being asked for bribe in developing nations, while their impact is statistically insignificant in developed nations.

Hunt (2004) estimates bribery models with no country variables and argues that quid pro quo between government officials and private citizens determines bribery. She suggests that such quid pro quos may be responsible for lower bribery rates in smaller

12. United Kingdom has the lowest corruption rate in Europe and second lowest in the entire sample after Japan. The data set contains 8,898 usable observations from the United Kingdom, which constitutes 16% of the sample. Dropping the United Kingdom from the sample of all counties did not influence the estimated coefficients reported in Table 4. In addition to the United Kingdom, 1,805 observations from Japan (which has almost no reported bribery in the data) are also excluded. Dropping both the United Kingdom and Japan from the overall sample reduces the sample size by almost 20%, but this has almost no impact on the estimated parameter reported in Table 4.

TABLE 2
Descriptive Statistics

Variable Name	Definition (Source)	Mean (Standard Deviation)
Individual characteristics		
Corruption	Dummy variable (=1) if the respondent is asked for bribe, 0 otherwise (A)	0.0415 (0.1994)
Small city	Dummy variable (=1) if the respondent is living in a town with a population of 50,000 less (A)	0.4428 (0.4967)
Middle-size city	Dummy variable (=1) if the respondent is living in a town with a population of 50,000 to 1 million (A)	0.3097 (0.4624)
Male	Dummy variable (=1) if the respondent is male, 0 otherwise (A)	0.4654 (0.4988)
Age		
16–19	Dummy variable (=1) if the respondent is between ages 16 and 19, 0 otherwise (A)	0.0280 (0.1649)
20–24	Dummy variable (=1) if the respondent is between ages 20 and 24, 0 otherwise (A)	0.0709 (0.2567)
25–29	Dummy variable (=1) if the respondent is between ages 25 and 29, 0 otherwise (A)	0.0998 (0.2997)
30–34	Dummy variable (=1) if the respondent is between ages 30 and 34, 0 otherwise (A)	0.1115 (0.3148)
35–39	Dummy variable (=1) if the respondent is between ages 35 and 39, 0 otherwise (A)	0.1191 (0.3239)
40–44	Dummy variable (=1) if the respondent is between ages 40 and 44, 0 otherwise (A)	0.1049 (0.3065)
45–49	Dummy variable (=1) if the respondent is between ages 45 and 49, 0 otherwise (A)	0.0921 (0.2892)
50–54	Dummy variable (=1) if the respondent is between ages 50 and 54, 0 otherwise (A)	0.0841 (0.2776)
55–59	Dummy variable (=1) if the respondent is between ages 55 and 59, 0 otherwise (A)	0.0705 (0.2560)
60–64	Dummy variable (=1) if the respondent is between ages 60 and 64, 0 otherwise (A)	0.0591 (0.2359)
65–69	Dummy variable (=1) if the respondent is between ages 65 and 69, 0 otherwise (A)	0.0558 (0.2296)
70+	Dummy variable (=1) if the respondent is older than 70 yr, 0 otherwise (A)	0.104 (0.3053)
Single	Dummy variable (=1) if the respondent is single, 0 otherwise (A)	0.2186 (0.4133)
Married	Dummy variable (=1) if the respondent is married, 0 otherwise (A)	0.5735 (0.4946)
Widowed	Dummy variable (=1) if the respondent is widowed, 0 otherwise (A)	0.0812 (0.2731)
Living together	Dummy variable (=1) if the respondent is living together as a couple (but not married), 0 otherwise (A)	0.0612 (0.2397)
Divorced	Dummy variable (=1) if the respondent is divorced, 0 otherwise (A)	0.0655 (0.2475)
Working	Dummy variable (=1) if the respondent is working, 0 otherwise (A)	0.5624 (0.4961)
Looking for job	Dummy variable (=1) if the respondent is looking for job, 0 otherwise (A)	0.061 (0.2394)
Home keeper	Dummy variable (=1) if the respondent is house keeper, 0 otherwise (A)	0.1099 (0.3128)
Retired/disabled	Dummy variable (=1) if the respondent is retired or disabled, 0 otherwise (A)	0.2138 (0.4100)
Student	Dummy variable (=1) if the respondent is still at school, 0 otherwise (A)	0.0348 (0.1833)

continued

TABLE 2
Continued

Variable Name	Definition (Source)	Mean (Standard Deviation)
Other	Dummy variable (=1) if the respondent is in other occupational position, 0 otherwise (A)	0.0181 (0.1333)
Upper income	Dummy variable (=1) if the family income is in the upper 50% of the country, 0 otherwise (A)	0.5056 (0.5000)
Education	Years of education of the respondent (A)	11.72 (3.781)
Country characteristics		
Europe	Dummy variable (=1) if the country is in Western Europe, 0 otherwise	0.4889 (0.5000)
Central Europe	Dummy variable (=1) if the country is in Central Europe, 0 otherwise	0.1637 (0.3700)
Africa	Dummy variable (=1) if the country is in Africa, 0 otherwise	0.0538 (0.2256)
Asia	Dummy variable (=1) if the country is in Asia, 0 otherwise	0.0864 (0.2810)
Latin America	Dummy variable (=1) if the country is in Latin America, 0 otherwise	0.0900 (0.2862)
United States, Canada, and Australia	Dummy variable (=1) if the country is in the United States, Canada, or Australia, 0 otherwise	0.1172 (0.3216)
Population	Population of the country in millions in the survey year (G)	61.178 (131.53)
War	Dummy variable (=1) if a war occurred during 1960s to 1980s, 0 otherwise (C)	0.1476 (0.3547)
Low expropriation risk	Expropriation risk in the country (high values indicate low expropriation risk, or stronger institutions) (C)	8.8165 (1.3569)
Average education	Average education of adults in the country in the survey year (J)	8.8601 (2.0113)
Unemployment rate	Unemployment rate among males in the country (F)	8.1474 (3.5761)
Landlocked	Dummy variable (=1) if the country is landlocked (surrounded by land), 0 otherwise (B)	0.1142 (0.3181)
Temperature	Average temperature of the country in Celsius (B)	11.934 (5.9486)
Year 95	Dummy variable (=1) if the survey in the country was done in 1995, 0 otherwise	0.4708 (0.4491)
Year 96	Dummy variable (=1) if the survey in the country was done in 1996, 0 otherwise	0.0228 (0.1494)
Year 99	Dummy variable (=1) if the survey in the country was done in 1999, 0 otherwise	0.5064 (0.5000)

The descriptive statistics pertain to 55,107 observations with nonmissing values in all variables. A: UNICRI International Crime Victim Survey version ICVS 2000_2(1); B: Parker (1997); C: Institutions and Geography: Comment on Acemoğlu, Johnson, and Robinson (2000), McArthur and Sachs (2001); F: World Development Indicators. CD World Bank 2003; G: Alan Heston, Robert Summers, and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002; J: World Bank, Education Statistics Database (http://www1.worldbank.org/education/edstats/).

cities and of older people because informal networks, which are associated with quid pro quos, may be easier to get established in smaller communities and older people may be more adept at forming them.[13] Table 4 shows that the propensity for being asked for a bribe is higher for males and for those who live in bigger cities, even in the sample of developed countries. To the extent that quid pro quos, based on informal networks, are less applicable to developed countries, these results suggest that a quid pro quo explanation of bribery may not be plausible.

A larger population size has a positive impact on the risk of bribery in developing

13. Hunt (2004) asserts that the finding that women have lower propensity for bribery could also be attributable to quid pro quo. She writes that this "could be because women may have more opportunity than men to pay in sexual favors, something perhaps not reported as a bribe."

TABLE 3
The Determinants of Corruption at the Individual Level

	Coefficient	Standard Error	Coefficient	Standard Error
	I	II	III	IV
Individual characteristics				
Small city	−0.0098***	0.0027	−0.0116***	0.0037
Middle-size city	−0.0061***	0.0018	−0.0065*	0.0036
Male	0.0079***	0.0012	0.0144***	0.0011
Upper income	0.0035***	0.0010	0.0065***	0.0013
Education	0.0010***	0.0002	0.0013***	0.0002
Age				
20–24	0.0039*	0.0025	0.0122***	0.0041
25–29	0.0025	0.0027	0.0118***	0.0047
30–34	0.0022	0.0034	0.0120**	0.0057
35–39	0.0018	0.0032	0.0071*	0.0046
40–44	−0.0004	0.0030	0.0025	0.0041
45–49	0.0008	0.0037	0.0027	0.0044
50–54	0.0010	0.0046	0.0007	0.0048
55–59	−0.0024	0.0031	−0.0044	0.0035
60–64	−0.0053***	0.0010	−0.0108***	0.0016
65–69	−0.0049	0.0024	−0.0115***	0.0021
70+	−0.0070***	0.0016	−0.0122***	0.0020
Single	−0.0027***	0.0009	−0.0031**	0.0012
Widow	0.0035	0.0030	0.0033	0.0036
Living together	0.0009	0.0021	0.0029	0.0029
Divorced	0.00003	0.0024	0.0025	0.0031
Working	0.0020	0.0013	0.0017	0.0020
Looking for job	0.0001	0.0019	0.000006	0.0024
Home keeper	−0.0001	0.0022	−0.0002	0.0028
Retired/disabled	−0.0021	0.0016	−0.0052**	0.0022
Other	0.0052*	0.0035	0.0040	0.0041
Country characteristics				
Europe	−0.0034	0.0040	—	—
Asia	−0.0091***	0.0012	—	—
Africa	−0.0095***	0.0013	—	—
Latin America	−0.0010	0.0060	—	—
Central Europe	0.0029	0.0074	—	—
Low expropriation risk	−0.0066***	0.0015	—	—
War	0.0005	0.0035	—	—
Population	0.00003***	0.000008	—	—
Unemployment rate	0.0006**	0.0003	—	—
Average education	−0.0037***	0.0010	—	—
Year 95	0.0005	0.0012	0.0019	0.0018
Year 96	−0.0039	0.0022	0.0048	0.0059
Country dummies	No	No	Yes	Yes
Number of observations	55,107		73,040	
Log likelihood	−6,874.02		−12,653.30	

The coefficients are the marginal effects. They are adjusted for clustering at the country level.
*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level or less.

TABLE 4
The Determinants of Corruption at the Individual Level

	Developed Countries		Developing Countries	
	Coefficient	Standard Error	Coefficient	Standard Error
	I	II	III	IV
Individual characteristics				
Small city	−0.0011*	0.0007	−0.0643***	0.0152
Middle-size city	−0.0010*	0.0006	−0.0476***	0.0177
Male	0.0013***	0.0005	0.0479***	0.0062
Upper income	0.0006	0.0004	0.0229***	0.0061
Education	0.000002	0.00004	0.0063***	0.0011
Age				
20–24	−0.0012	0.0004	0.0243*	0.0134
25–29	−0.0001	0.0012	0.0088	0.0143
30–34	−0.0007	0.0010	0.0092	0.0195
35–39	−0.0005	0.0008	0.0063	0.0184
40–44	−0.0007	0.0007	−0.0067	0.0189
45–49	−0.0015*	0.0003	0.0054	0.0240
50–54	−0.0008	0.0007	0.0026	0.0289
55–59	−0.0003	0.0011	−0.0243	0.0189
60–64	−0.0015	0.0003	−0.0377***	0.0087
65–69	−0.0008	0.0009	−0.0378	0.0178
70+	−0.0007	0.0007	−0.0558***	0.0086
Single	0.0017***	0.0008	−0.0244***	0.0046
Widow	−0.0003	0.0009	0.0260	0.0179
Living together	0.0017	0.0014	0.00002	0.0143
Divorced	0.0010	0.0012	−0.0035	0.0157
Working	0.0770**	0.1080	0.0100	0.0082
Looking for job	0.9078**	0.3226	−0.0053	0.0106
Home keeper	0.7721**	0.5681	−0.0019	0.0137
Retired/disabled	0.5250*	0.6419	−0.0147	0.0099
Other	—	—	0.0308*	0.0185
Country characteristics				
Europe	−0.0024**	0.0013	0.1786***	0.0692
Asia	−0.0016***	0.0003	0.0643	0.0590
Africa	—	—	0.2086***	0.0409
Latin America	—	—	0.2081***	0.0584
Low expropriation risk	0.0006	0.0011	−0.0427***	0.0055
War	—	—	−0.0098	0.0229
Population	−0.000002	0.000003	0.0002***	0.00005
Unemployment rate	−0.00003	0.0001	0.0055**	0.0027
Average education	−0.0008***	0.0002	−0.0273**	0.0110
Year 95	0.0006	0.0003	−0.0046	0.0055
Year 96	—	—	−0.0358*	0.0177
Number of observations	33,839		20,897	
Log likelihood	−643.98		−6,094.84	

The coefficients are the marginal effects. They are adjusted for clustering at the country level.
*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level or less.

TABLE 5
The Impact of Selected Variables on an Individual's Risk of Being Asked for a Bribe

The Impact of	**... on the Risk of Being Asked for a Bribe**
Living in a small city (as opposed to a large city)	−1 ppt (24% decline)
Living in a middle-size city (as opposed to a large city)	−0.7 ppt (17% decline)
Being male	1 ppt (24% increase)
Being in the upper 50% of the family income distribution	0.4–0.7 ppt (10%–17% increase)
Having an additional year of education	0.1 ppt (2% increase)
Being younger than 40 yr	0.2–1 ppt (5%–24% increase)
Being single	−0.3 ppt (7% decline)
An improvement in the expropriation risk by one standard deviation (15% of the sample mean)	−1 ppt (24% decline)
A 1 percentage point higher unemployment rate	0.06 ppt (1.5% increase)
An increase in population by 10 million	0.03 ppt (0.7% increase)
An increase in average education of the country by 1 yr	−0.4 ppt (10% decline)

Note: ppt = percentage point.

countries. Increased level of education in the country lowers the bribery risk in both groups of countries. Low expropriation risk and low unemployment rate are associated with reduced bribery risk in developing countries, while their impact is insignificant in developed nations. The results of the impact of personal characteristics did not change when the models included country fixed effects (see Table A1).

Table 5 presents a summary of the results where the impact of the explanatory variables on the propensity of being asked for a bribe is displayed. The numbers in parentheses indicate the changes in the risk of bribery as a proportion of the sample mean of bribery. For example, living in a middle-size city is associated with a 0.7 percentage point reduction in the risk of being asked for a bribe in comparison to living in a large city; and this response translates into 17% decrease with respect to the average bribery risk.

C. Potential Endogeneity

The model contains a number of variables to control for those characteristics of the country, which may be correlated with both corruption propensity and institutional quality. However, if the expropriation risk is correlated with some omitted cultural factors, which also influence corruption, the estimates may be biased. For example, religious structure and legal origin of the country may have an impact on both the risk of bribery and the quality of institutions.[14] Therefore, I also estimate the model with instrumental variable probit, where the expropriation risk is considered as endogenous, which is instrumented by geographical attributes of the country, measured by the average temperature and whether the country is landlocked. The geographical characteristics of the country are exogenous, and McArthur and Sachs (2001) argue that they are appropriate instruments for institutions and other determinants of economic growth. The descriptive statistics of these variables are reported in Table 2.

The results of the instrumental variable probit are reported in Table 6. The point estimates and statistical significance are very similar to those reported in the benchmark model (Columns 1 and 2 of Table 3). These results, taken together, underline the robustness of the estimated effects of personal and country characteristics.

V. SUMMARY AND CONCLUSIONS

This paper uses a microlevel data set to investigate the determinants of being asked for a bribe at the individual level, which is defined as having been asked for a bribe by a government official, such as a government worker, customs officer, police officer, or

14. Mocan (2004) contains regressions that controls for additional country characteristics. The results are the same.

TABLE 6
The Determinants of Corruption
Instrumental Variable Probit

	Coefficient	Standard Error
	I	II
Individual characteristics		
Small city	−0.0084***	0.0015
Middle-size city	−0.0049***	0.0014
Male	0.0079***	0.0008
Upper income	0.0033***	0.0007
Education	0.0009***	0.0001
Age		
20–24	0.0043**	0.0021
25–29	0.0035*	0.0021
30–34	0.0029	0.0021
35–39	0.0026	0.0021
40–44	−0.0001	0.0018
45–49	0.0009	0.0021
50–54	0.00004	0.0020
55–59	−0.0023	0.0017
60–64	−0.0048**	0.0015
65–69	−0.0046**	0.0016
70+	−0.0072***	0.0012
Single	−0.0020**	0.0008
Widow	0.0037*	0.0022
Living together	0.0010	0.0015
Divorced	0.0002	0.0014
Working	0.0014	0.0013
Looking for job	0.0007	0.0016
Home keeper	−0.0006	0.0015
Retired/disabled	−0.0023	0.0017
Other	0.0047**	0.0029
Country characteristics		
Europe	−0.0022	0.0026
Asia	−0.0059*	0.0022
Africa	−0.0084**	0.0014
Latin America	0.0082	0.0095
Central Europe	0.0142*	0.0107
Low expropriation risk	−0.0076**	0.0030
War	0.0006	0.0052
Population	0.00003***	0.000008
Unemployment rate	0.0006***	0.0001
Average education	−0.0035***	0.0005
Year 3	0.0008	0.0009
Year 4	−0.0030	0.0027
Number of observations	55,107	
Log likelihood	−6,744.49	

The coefficients are the marginal effects. They are adjusted for clustering at the country level.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level or less.

inspector in that country. The paper also portrays the extent of corruption as revealed by citizens by creating a country-level indicator, which is the proportion of individuals in a country who were asked for a bribe in a year. This is the first direct measure of corruption created in this literature, which gauges how widespread corruption is in the country. This measure is shown to be highly correlated with widely used corruption *perception* indexes such as the ones generated by TI, BI, and ICRG. However, some countries, such as Argentina and Indonesia, seem to be outliers where the extent of bribery reported in these data is more severe than the perceived corruption in those countries. This could be because the corruption perception indices are based on surveys that draw their information from a group of experts, many of whom do not live in the countries in question. The questions asked are generally related to how bribery affects legislative action, judicial processes, or the operation or contracting of business in these countries. In 1995, Argentina was 4 yr into a successful dollarization program and was taking aggressive steps to increase foreign investment by streamlining bureaucracy, privatization, and decreased tariffs. During the same time period, Indonesia was experiencing unprecedented growth resulting from liberalization of the economy and increased foreign direct investment. These developments may have generated optimistic outlooks for outside experts regarding these economies, which may have positively influenced their perception about the extent of corruption, as it relates to business, in these countries.[15]

The bulk of the econometric analysis of the determinants of bribery is done using more than 55,000 individuals from 30 countries who have no missing data on personal and country attributes. The results show that both personal and country characteristics determine the likelihood of being asked for a bribe. Highly educated and high-income individuals have higher exposure to being asked for a bribe by a government official. Males are more frequent targets of bribery, possibly because in most countries, males are more active than females in the labor market for various reasons, and therefore, they have more exposure

15. Wishful thinking on the part of these experts in 1995 regarding the economic performance of Argentina and Indonesia cannot be ruled out. Both Argentina and Indonesia faced serious economic crises in late 1990s.

to government officials. The same is true for those who are younger than 20 yr or older than 60 yr. Living in larger cities increases the risk of exposure to bribery. This could be because economic activity may be larger and more varied in scope, which may increase the contact with the government. It could also be the case that the relationship between individuals and government officials may be less personal in larger cities in comparison to smaller ones, which may make it easier to ask for a bribe.

Country attributes also affect corruption and some country characteristics lend themselves to policy action. For example, the strength of institutions in the country (as measured by low risk of expropriation) has the benefit of reducing the extent of corruption in the country. If the risk of expropriation in the country goes down by one standard deviation, this reduces the propensity of corruption by almost 1 percentage point. Similarly, an improvement in the average education of the country is negatively related to the bribery risk of the individuals and an increase in the unemployment rate increases the risk of bribery.

APPENDIX

Country Participation in the ICVS

The initial survey, conducted in 1989, included 15, mostly industrialized countries. They are Australia, Belgium, Canada, England/Wales, West Germany, Finland, France, The Netherlands, Northern Ireland, Norway, Scotland, Spain, Switzerland, United States, and Japan. The 1992 survey included eight of the countries from the first survey (Australia, Belgium, Canada, England/Wales, Finland, The Netherlands, United States, and Japan), three new industrialized countries (Italy, Sweden, and New Zealand), and the cities of Surabaja (Indonesia) and Warsaw (Poland). Seven countries in the original survey declined to participate in the second survey, primarily due to the short time interval between surveys. In all but three countries, the surveys were conducted under the direction of the Working Group for the project: overall coordinator Jan J. M. van Dijk, Ministry of Justice/University of Leiden, The Netherlands; Patricia Mayhew, Home Office of the United Kingdom; and Ugliesa Zvekic, UNICRI. (The UNICRI became involved with the ICVS in 1991.) The remaining three countries were included because the data collected were considered comparable to the data collected for the countries under direction of the Working Group (Van Dijk and Mayhew 1992). The 1992 surveys started the second round of the ICVS. Between 1992 and 1994, the participating countries expanded to include Central and Eastern European countries. As Zvekic (1998) indicates, this was mainly due to the interest of the international community and donors in the reform process toward a market economy and a democratic political system. Note that Bosnia and Herzegovina did not participate because of the tragic conflict experienced at the time, and Moldova was not included because of a lack of confidence in the country's ability to conduct the survey to ICVS standards. As noted by Alvazzi del Frate and Van Kesteren (2004), interest in developing countries and a particular interest in prevention of international urban crime have guided the expansion of the ICVS to include more than 70 countries from 1989 to 2000 in four sweeps.

TABLE A1

Developed and Developing Countries Models with Country Dummies

	Developed		**Developing**	
	Coefficient	**Standard Error**	**Coefficient**	**Standard Error**
Individual Characteristics	**I**	**II**	**III**	**IV**
Small city	−0.0011*	0.0006	−0.0426**	0.0150
Middle-size city	−0.0009*	0.0005	−0.0244	0.0177
Male	0.0013**	0.0004	0.0532***	0.0042
Upper income	0.0006	0.0004	0.0254***	0.0051
Education	0.000002	0.00004	0.005***	0.0000
Age				
20–24	−0.0012	0.0005	0.044***	0.0132
25–29	−0.0002	0.0011	0.0383**	0.0152
30–34	−0.0007	0.0009	0.0422**	0.0192
35–39	−0.0006	0.0008	0.0243	0.0160
40–44	−0.0008	0.0007	0.0081	0.0151
45–49	−0.0015*	0.0004	0.0111	0.0166
50–54	−0.0009	0.0007	0.0013	0.0182

continued

TABLE A1
Continued

	Developed		Developing	
	Coefficient	Standard Error	Coefficient	Standard Error
Individual Characteristics	**I**	**II**	**III**	**IV**
55–59	−0.0004	0.0010	−0.021	0.0136
60–64	−0.0015	0.0004	−0.045***	0.0075
65–69	−0.0009	0.0008	−0.05**	0.0098
70+	−0.0008	0.0007	−0.0534***	0.0084
Single	0.0018**	0.0008	−0.0155**	0.0045
Widow	−0.0002	0.0009	0.0138	0.0137
Living together	0.0013	0.0014	0.0101	0.0111
Divorced	0.001	0.0011	0.0076	0.0116
Working	0.0852***	0.0185	0.0048	0.0075
Looking for job	0.932***	0.0408	−0.0036	0.0083
Home keeper	0.8205***	0.0783	−0.0019	0.0103
Retired/disabled	0.5779***	0.0908	−0.0199**	0.0087
Other	—	—	0.0159	0.0145
Year 95	0.0009**	0.0005	−0.0002	0.0010
Year 96	—	—	−0.0307***	0.0056
Number of observations	33,839		38,830	
Log likelihood	−638.15		−11,880.99	

The coefficients are the marginal effects. They are adjusted for clustering at the country level.
*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level or less.

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