4 Corruption, corruption perception and economic growth

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4.1 Introduction

Theoretical links between corruption and economic growth have been studied rather extensively and various explanations into the nature of this link have been offered. Shleifer and Vishny (1993), for example, argue that the weakness of central government, which would permit various competing government agencies to impose bribes on private agents, can be the cause of diminished investment. Also, the need for secrecy surrounding corruption may lead to distortions which may in turn discourage productive investment projects and therefore hamper economic growth. Ehrlich and Lui (1999) develop an endogenous growth model where investment in human capital generates growth. Individuals have an incentive to compete to become bureaucrats because bureaucracy has access to rent seeking through corruption. Such investment in political capital, which aims at bureaucratic power, is not productive and the interplay between human capital and political capital determines the path of economic growth.[1]

Empirical analyses have investigated the theorized link between corruption and growth, as well as the various pathways through which corruption impacts growth. Bliss and Di Tella (1997) show that corruption leads to the exit of firms and to a decline in production and economic growth. Mauro (1998) shows that corruption and government expenditure on education are negatively correlated, and Wei (2000) demonstrates that corruption has a negative impact on foreign direct investment. Mauro (1995) and Meon and Sekkat (2005) find that corruption is associated with a slower rate of economic growth.

The current empirical research relies on *subjective* measures of corruption. That is, it employs various indices of *corruption perception*, based on the surveys of international business people, expatriates, risk analysts, and local residents. In this chapter, I use data obtained from over 90,000 individuals in 49 countries pertaining to their direct experiences with corruption. Using this micro data set, an aggregate (country level) corruption index is created, which is the weighted proportion of individuals who were asked for a bribe in the country. This index that serves as a direct indicator of the breadth of corruption, is compared to two widely-used corruption perception indices generated by Transparency International and the World Bank.

Each individual in the data set is 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. Exploiting this information, the proportion of bribes asked for by various players, such as government officials, police officers, customs' officers, inspectors and other officials is calculated. The relationship between corruption perception indices (that have been widely-used in previous research) and these various sources of corruption is analyzed. The results demonstrate that the extent of corruption in government offices and the police have significant impacts on perceived corruption in the country. However, when the quality of the institutions (measured by the risk of expropriation) in the country is controlled for, the association between actual corruption in the country and the corruption perception about the country disappears. Instead, the quality of institutions turns out to be a significant determinant of corruption perception about the country.

The results reported in this chapter also show that for the countries in this data set, per capita income growth between 1975 and 1995 is influenced by the quality of the institutions of the country; but keeping the quality of the institutions constant, the extent of corruption does not exert a statistically significant impact on economic growth. This result is in contrast to earlier studies which suggested the existence of a direct negative impact of corruption on economic development/growth.

The data set employed in the paper contains a wide range of countries, including developing countries. While no Middle East and North Africa (MENA) country is represented in the sample, there is no compelling reason to presume that the countries in the MENA region would be structurally different from those included in the data set in such a way to make the results inapplicable to this region. In contrast, as I argue later in the chapter, there are valuable lessons that can be derived from this study about the potential effects of corruption on MENA economies.

4.2 Corruption data

The data to measure the extent of corruption are obtained from the International Crime Victim Survey compiled by the United Nations Inter-regional Crime and Justice Research Institute (http://www.unicri.it/icvs) through face-to-face or telephone interviews with individuals in each country who were asked the following 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?" A binary variable is then created to take the value of 1, if the respondent indicated that he/she was asked for a bribe, and zero otherwise.

Table 4.1 presents the list of countries included in the analysis, the number of individuals surveyed in each country, and the year of the bribery experience of the individuals (which is the year prior to the survey). The fourth column of Table 4.1 displays average corruption in each country, which is the weighted proportion of people who indicated that they were asked for a bribe. For example in

Belgium 0.35 percent of the individuals indicated that they were asked for a bribe, where the rates are 8 percent in the Czech Republic, about 19 percent in Russia, and 29 percent in Argentina. The highest corruption rate is in Indonesia, where 31 percent of citizens indicated that they were asked for a bribe. Western European countries have very low corruption rates, with the proportion of people who were asked for a bribe constituting less than 0.5 percent of the population; and the risk of being asked for a bribe is virtually zero in Japan.

There are two dimensions to corruption: how widespread it is in the country (breadth) and the average amount asked for in bribes (depth). Two widely-used aggregate corruption *perception* indices are those created by Transparency International (TI) and by the World Bank (WB).[2] Because these indices measure corruption perception, it is unclear whether they capture the beliefs about the depth or breadth of corruption, or whether they are combinations of both. In contrast, the index listed in column 4 of Table 4.1 (average corruption) is a measure of the breadth of corruption.

Figures 4.1–4.3 display the corruption measure created from the data set used in this chapter (average overall corruption reported in Table 4.1) along with the subjective corruption perception indices of TI and WB, where corruption perception indices are reversed such that higher values represent higher levels of corruption. For each country, the data are merged with corruption perception indices by year. As can be seen in Table 4.1, France, for example, has been surveyed twice, and individuals were asked about their corruption experiences in 1995 and 1999, making the TI index available for both of these years. Therefore, average corruption in France in 1995 (0.7) is matched with the corresponding value of the TI index in 1995, and average corruption in France in 1999 (1.25) is matched with the value of the TI index for France in 1999. Thus, some countries contribute more than one observation in Figures 4.1–4.3.[3] The World Bank corruption index is created for the years 1996, 1998, 2000 and 2002 (Kaufmann, Kraay and Mastruzzi, 2004). Therefore, the closest year of the World Bank index is matched with our data. For example, for countries where corruption activity pertains to 1995 in our data, the World Bank index of 1996 is used.

The curves in Figures 4.1 and 4.2 are the predicted values from regressions of perceived corruption indices on the percentage of individuals who are asked for a bribe (displayed on the horizontal axes). In all cases a non-linear relationship is visible. Regressions with quadratic terms of corruption provided better fits. For example, in the regression with TI perception index as the dependent variable (Figure 4.1), the adjusted R-square was 0.77, and it was 0.59 without the quadratic term. In the regressions involving the WB corruption perception index, the adjusted R-square was 0.62 in the linear case, and 0.80 in the quadratic case (Figure 4.2). This non-linearity is primarily due the fact that in a small number of countries, such as Argentina, Bolivia and Indonesia, citizens have reported high levels of corruption, but the external perception of corruption is relatively low for these countries. For example, Figure 4.1 shows that in Argentina 29 percent of the people indicate that they were asked for a bribe, while the perception of corruption based on the TI index does not fully reflect this phenomenon.

Table 4.1 The incidence of corruption by country, by type

Country	*Year of activity*	*No. obs.*	*Average corruption (overall)*	*Government corruption*	*Police corruption*	*Customs corruption*	*Inspector corruption*	*All other corruption*
Western European Countries								
United Kingdom	1995	5404	0.25	20.47	38.67	0.00	15.98	24.87
United Kingdom	1999	5513	0.07	54.33	0.00	45.67	0.00	0.00
Netherlands	1995	2007	0.55	81.07	0.00	10.44	0.00	8.50
Netherlands	1999	1998	0.40	20.66	42.40	24.64	0.00	12.29
Switzerland	1995	1000	0.23	0.00	57.94	25.97	0.00	16.09
Belgium	1999	2499	0.35	32.23	31.86	0.00	0.00	35.91
Finland	1995	3829	0.13	0.00	0.00	0.00	21.48	78.52
Finland	1999	1780	0.16	67.15	0.00	0.00	0.00	32.85
Sweden	1995	1000	0.25	0.00	60.06	0.00	0.00	39.94
Sweden	1999	2001	0.09	55.31	44.69	0.00	0.00	0.00
Austria	1995	1507	0.72	0.00	38.02	17.48	0.00	44.50
Denmark	1999	3006	0.28	13.96	8.20	45.49	12.46	19.89
Mediterranean Countries								
France	1995	1003	0.70	67.42	10.09	0.00	0.00	22.49
France	1999	997	1.25	6.30	29.61	60.87	0.00	3.22
Spain	1999	2908	0.25	14.92	41.37	15.12	0.00	28.60
Malta	1996	993	4.08	28.40	12.11	47.26	6.95	5.29
Portugal	1999	1998	1.35	30.31	51.41	0.00	9.14	9.14

Table 4.1 (continued)

Table 4.1 (continued)

Country	*Year of activity*	*No. obs.*	*Average corruption (overall)*	*Government corruption*	*Police corruption*	*Customs corruption*	*Inspector corruption*	*All other corruption*
U.S., Canada and Australia								
United States	1995	1000	0.27	0.00	100.00	0.00	0.00	0.00
United States	1999	999	0.21	100.00	0.00	0.00	0.00	0.00
Canada	1995	2132	0.39	5.92	43.76	30.28	0.00	20.04
Canada	1999	2075	0.39	23.87	37.32	23.22	15.58	0.00
Australia	1999	2003	0.33	63.63	36.37	0.00	0.00	0.00
Central and Eastern European Countries								
Estonia	1994	1153	3.91	5.06	25.32	12.66	15.19	41.77
Poland	1991	1974	5.46	33.57	10.69	19.05	24.25	12.43
Poland	1995	3438	4.80	27.86	31.88	13.38	17.51	9.36
Poland	1999	5194	5.17	1.00	46.67	2.15	0.68	49.50
Czech Republic	1995	1752	8.09	42.52	21.88	3.98	23.53	8.09
Slovakia	1996	1091	14.14	25.40	32.52	5.49	27.56	9.03
Russia	1995	1006	18.96	16.07	52.21	5.71	8.25	17.76
Georgia	1995	1110	22.34	14.16	28.62	27.40	27.18	2.64
Slovenia	1996	2046	1.24	8.47	9.55	46.69	1.07	34.22
Latvia	1995	1380	13.80	34.27	11.05	28.41	16.64	9.64
Romania	1995	1083	11.48	55.57	14.19	6.57	7.21	16.46
Hungary	1995	746	3.92	12.75	34.62	21.24	0.00	31.38

Table 4.1 (continued)

Country	*Year of activity*	*No. obs.*	*Average corruption (overall)*	*Government corruption*	*Police corruption*	*Customs corruption*	*Inspector corruption*	*All other corruption*
Yugoslavia	1995	1089	17.50	26.77	40.48	21.21	4.35	7.19
Albania	1995	1188	12.95	34.70	7.98	12.44	18.22	26.66
Macedonia	1995	698	7.75	19.13	9.67	33.28	6.64	31.28
Croatia	1996	981	16.25	21.36	47.11	10.26	4.51	16.77
Ukraine	1996	979	12.87	23.67	26.00	12.79	8.66	28.88
Belarus	1996	960	12.50	34.09	20.62	16.79	9.38	19.12
Bulgaria	1996	1066	19.32	4.68	54.72	15.14	6.08	19.38
Lithuania	1996	1165	11.12	22.81	34.28	24.47	6.05	12.39
Asian Countries								
Japan	1999	2198	0.04	100.00	0.00	0.00	0.00	0.00
Indonesia	1995	1338	31.11	36.75	53.61	1.98	0.00	7.65
Philippines	1995	1497	4.37	46.46	29.93	8.16	6.59	8.87
India	1995	1193	21.19	56.66	17.24	5.31	10.64	10.16
Mongolia	1995	1188	4.67	24.64	17.42	36.63	12.62	8.69
Kyrgyz Repub.	1995	1714	20.87	38.48	25.52	19.67	13.08	3.24
African Countries								
Uganda	1995	1191	23.72	34.83	28.24	15.75	3.47	17.71
South Africa	1995	996	7.63	9.32	46.12	2.25	18.71	23.61
Zimbabwe	1995	1003	7.22	26.49	30.51	15.59	13.68	13.73

Table 4.1 (continued)

Table 4.1 (continued)

Country	*Year of activity*	*No. obs.*	*Average corruption (overall)*	*Government corruption*	*Police corruption*	*Customs corruption*	*Inspector corruption*	*All other corruption*
Botswana	1996	638	2.92	43.60	20.91	20.49	0.00	15.01
Latin American Countries								
Costa Rica	1995	998	9.97	11.28	22.06	4.45	53.87	8.34
Brazil	1995	1000	17.86	5.95	49.83	17.94	26.27	0.00
Argentina	1995	996	29.35	3.53	71.33	7.89	16.81	0.44
Bolivia	1995	994	26.00	19.37	43.87	4.10	17.25	15.41
Paraguay	1995	585	13.86	24.58	28.49	13.27	30.70	2.97
Colombia	1996	984	19.53	22.12	32.30	13.36	3.88	28.34

Notes Corruption rates are weighted means of individuals who indicated that they were asked for a bribe in that country. Government corruption, police corruption, customs corruption, inspector corruption and other corruption stand for the distribution of bribes between these groups.

Figure 4.1 shows that a number of countries have very low levels of corruption, although their *perceived* corruption seems disproportionately high. 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 4.1 as the dotted curve, values not much different from those provided by the quadratic regression. In order to minimize the impact of outliers in a different way, robust regressions are estimated, producing coefficient estimates and predicted values very similar to those obtained from quadratic OLS regression. The predicted values from robust regressions are displayed in Figures 4.1 and 4.2 as dashed lines.

Another way to address the nonlinearity is to run regressions on a logarithmic scale. Figure 4.3 presents the data and the predicted values of the regression where the logarithm of the TI corruption perception index is regressed on the logarithm of actual corruption. The point estimate was 0.35 with a t-statistic value of 10.6 (n=56, adjusted R-square=0.67), suggesting that a 10 percent increase in the rate of bribery in the country increases the corruption perception of the country by 3.5 percent. The corresponding elasticity estimated using the WB perception index was 0.64, with a t-statistic value of 4.26 (adjusted R-square=0.23).

Finally, multiple observations from some countries are dropped and regressions are re-estimated. For the six countries that are surveyed both in 1995 and 1999 (see Table 4.1 and Note 2), I dropped observations pertaining to 1999. In the case of Poland, surveyed in 1991, 1995 and 1999, I dropped 1991 and 1999. Estimating the regressions without these eight observations did not change the pictures depicted in Figures 4.1–4.3.

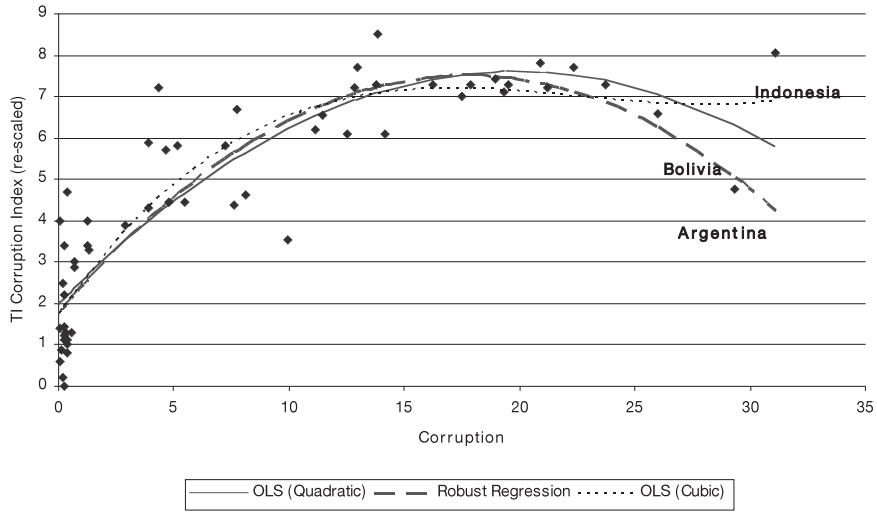

Figure 4.1 Transparency International corruption index vs. corruption in the country.

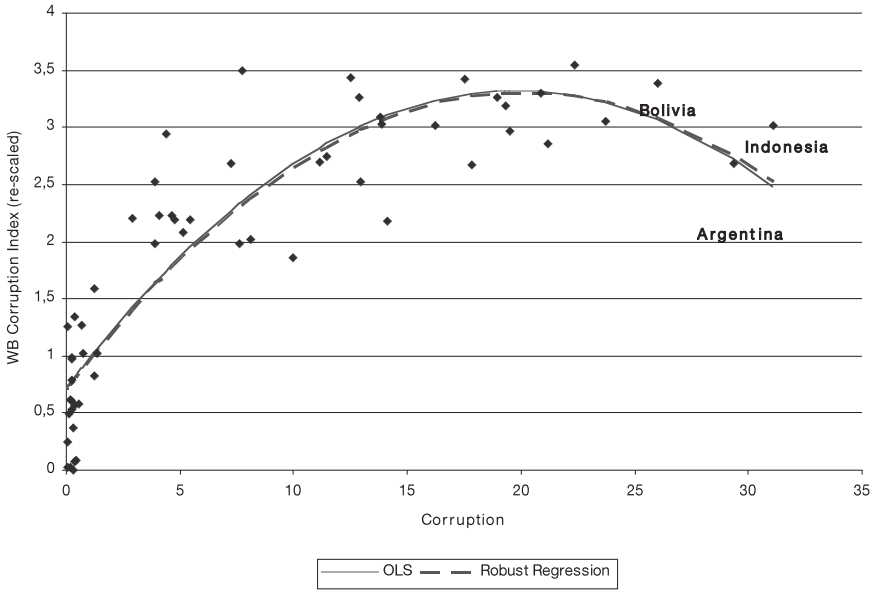

Figure 4.2 World Bank corruption index vs. corruption in the country.

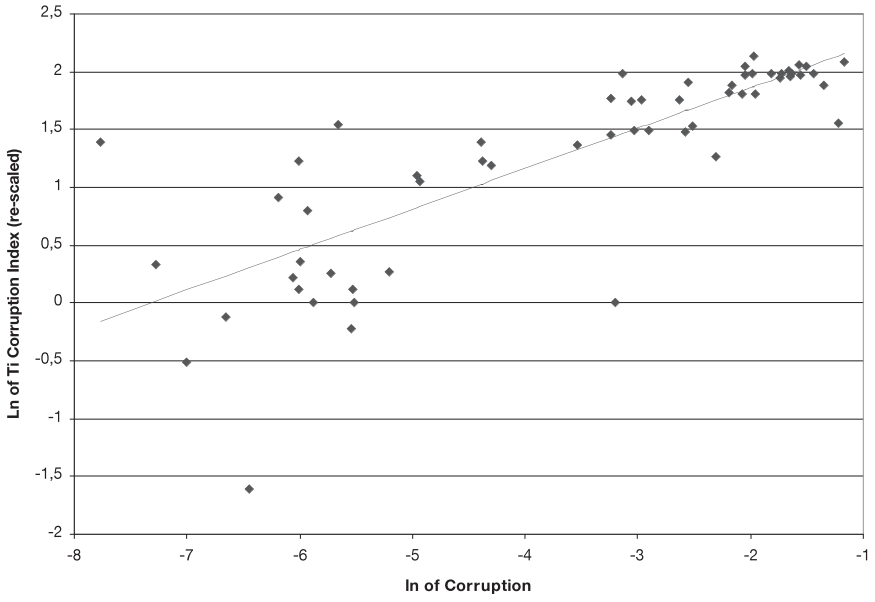

Figure 4.3 Log of Transparency International corruption index vs. log of corruption in the country.

4.3 Corruption and growth: theoretical considerations

Treisman (2000) details a number of hypotheses that link the level of corruption to the legal, political and socio-economic characteristics of the country. Specifically, it is suggested that:

$$COR_j = f_1(L_j, C_j, Econ_j), \tag{4.1}$$

where the extent of corruption in country j (COR_j) depends on legal (L_j) and cultural (C_j) attributes as well as the level of economic development of the country ($Econ_j$). Economic development, on the other hand, 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:

$$Econ_j = f_2(COR_j, K_j, C_j, H_j, L_j) \tag{4.2}$$

Acemoglu, 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. Later in the chapter, I estimate versions of Equation 2 to identify the impact of corruption on development.

Following La Porta, *et al.* (1999) and Treisman (2000), many models include variables that measure the structure of the existing legal system in the country. La Porta, *et al.* (1999) argue more specifically that the common law system developed in England in the 17th century has been shaped by parliament and the aristocracy at the expense of the crown and it is intended to limit the power of the sovereign. As a consequence, British common law puts emphasis on individuals' private and property rights, and it intends to limit, rather than strengthen, the power of the state (David and Brierley, 1978; La Porta, *et al.*, 1999). In comparison, French civil law, Scandinavian civil law, and German civil law are designed as instruments of the state to expand its power; and socialist law is a manifestation of the state's intent to create institutions to maintain power and extract resources without much regard for protecting economic interests (La Porta, *et al.*, 1999). Thus, countries with legal systems of British origin are expected to experience a lower incidence of corruption.

As discussed in Acemoglu, Johnson and Robinson (2001), an argument dating back to Max Weber points to religion as a determinant of economic performance. Treisman (2000) argues that religion may have a direct impact on corruption through two means. First, religion is a major part of culture, and in countries with hierarchical religions such as Catholicism, Eastern Orthodoxy and Islam, it may be culturally more difficult to challenge the authority of office-holders in comparison to cultures with more individualistic or egalitarian religions such as Protestantism. Second, as argued by Treisman (2000), in religions such as Protestantism, which

emerged as a reaction to a state-sponsored religion, there may be stronger emphasis on monitoring potential abuses of state officials. By contrast, in more traditional religions such as Islam or Catholicism, such checks and balances may be absent.

The impact of centralized versus de-centralized governmental structure on the level of corruption is unclear. There exist various theories that predict detrimental effects of both. For example, it is argued that the existence of a federal system leads to more honest government because it promotes competition between various jurisdictions (Weingast, 1995). Alternatively, it is hypothesized that a federal structure may lead to more corruption because in that system there are fewer centralized forces to enforce honesty, and the level of interaction between potential corrupters and government officials is greater at the local level (Tanzi, 1995). To investigate the impact of government structure, I control whether the country has a federal system of government.

Higher quality institutions and involvement in a war in recent history are expected to influence the economic development of a country. Following Acemoglu, 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. War is measured by a dichotomous variable that takes the value of one if a war occurred during the three decades from the 1960s to the 1980s, and zero otherwise. Because corruption is endogenous as depicted by Equation 1, Equation 2 will be estimated by instrumental variables. As explained below, institutional quality and corruption are instrumented by geographic indicators, as employed by McArthur and Sachs (2001).

4.4 Is perceived corruption related to the source of corruption?

Aggregate corruption perception indicators used in previous research, such as the Transparency International index and the World Bank index, measure, for the most part, the sentiments of business people and international organizations.[4] Thus, they can be considered measures of risk assessment for the relevant countries. I investigate whether the extent of perceived corruption is related to particular types of corruption incidence in the country. More importantly, I also analyze whether the institutional quality of the country has a direct influence on corruption perception about the country, controlling for the source of corruption. This is important for two reasons. First, this analysis will help us understand how perceptions of corruption are formed. Second, if perceived corruption about a country hurts that country's economic development, it would be important to shed light into the question of how to alter the perceived corruption.

The UN International Crime Victim Survey included a follow-up question for those who indicated that they were asked for a bribe: "[The last time somebody asked for a bribe], what type of official was involved?" In some years of the survey, the alternatives were government official, customs officer, police officer, inspector, and other. In some other years, the respondents were offered a larger

set of alternatives including government official, customs officer, police officer, inspector, elected municipal councilors, municipal officials, tax/revenue officials, doctors/nurses, teachers/professors, officials in courts, private sector, and other. This allows a classification of the extent of bribery by type of recipient.

For each country, the weighted percentage of bribes asked by each category is calculated, as displayed in columns 5–9 of Table 4.1. For example in Malta, 28 percent of the bribes were asked by government officials, 12 percent were asked by the police, 47 percent asked by customs officers, and 7 percent were asked by inspectors, with the remainder asked by others. Within each country, these percentages add up to 100.

Table 4.2 presents the descriptive statistics of that data that are employed in empirical analyses. Average corruption is the corruption index created in this paper (column 4 of Table 4.1). The Transparency International and World Bank corruption perception indices are described earlier. These indices have been employed in Figures 4.1–4.3. Government corruption, police corruption, customs corruption, inspector corruption and other corruption are also measured as described above. As Table 4.2 shows, the majority of all bribes are asked by government officials or police officers. Specifically, 30 percent of all bribes are solicited by government officials, and about 32 percent of bribes are solicited by the police.

Table 4.3a displays estimation results from the regression of reversed-TI index scores on region dummies (Central Europe, Mediterranean, etc.), legal origin dummies and variables that measure the religious composition of the country. Regressions also include the variables listed in Table 4.2. Standard errors are adjusted for clustering at the region level, and the models are estimated with instrumental variables, where corruption measures and the expropriation index are instrumented by the extent of ethnolinguistic fragmentation and geographical characteristics of the country such as average temperature, absolute latitude, and whether the country is landlocked. The geographical characteristics of the country are exogenous, and serve as appropriate instruments for institutions and other determinants of economic growth as argued by McArthur and Sachs (2001). The degree of ethnolinguistic fragmentation of the country changes only slowly over time.

The results displayed in Panel A of Table 4.3a are from the regression where the rate of overall bribery (average corruption) is the indicator of corruption incidence as an explanatory variable. Column 1 of Table 4.3a demonstrates that an increase in average corruption in the country generates an increase in perceived corruption about that country measured by the TI index. A non-linear relationship was evident in a regression with no control variables (which created Figure 4.1). Therefore, column 2 adds the quadratic corruption term to the regression, but the existence of the control variables eliminates the statistical significance of the quadratic term. On the other hand, the hypothesis that linear and quadratic terms are jointly significant is rejected at the 1.6 percent level. The F-tests pertaining to this hypothesis are reported for each regression.

When expropriation risk is added to the model (column 3) a different picture emerges. Neither the expropriation nor the corruption variables are individually significant, but the hypothesis that corruption variables are jointly zero cannot be

Table 4.2 Descriptive statistics

Variable name	*Definition (source)*	*Mean (std. dev)*
Corruption	The proportion of individuals in the country who are asked for a bribe.	6.77 (9.09)
Transparency International measure of corruption	Reversed Transparency International corruption perception index (higher values represent higher corruption perception)	3.98 (2.55)
World Bank measure of corruption	Reversed World Bank corruption perception index (higher values represent higher corruption perception)	1.58 (1.09)
Corruption by type		
Government corruption	The proportion of individuals (among those who were asked for a bribe) targeted by a government official	30.08 (26.69)
Police corruption	The proportion of individuals (among those who were asked for a bribe) targeted by a police officer	31.73 (21.67)
Customs corruption	The proportion of individuals (among those who were asked for a bribe) targeted by a customs' officer	12.94 (14.31)
Inspector corruption	The proportion of individuals (among those who were asked for a bribe) targeted by an inspector	8.44 (11.38)
Other corruption	The proportion of individuals (among those who were asked for a bribe) targeted by other – see text for details	16.81 (16.20)
Country characteristics		
Western Europe	Dummy variable (=1) if the country is in Western Europe, 0 otherwise	0.28 (0.45)
Mediterranean	Dummy variable (=1) if the country is in Mediterranean region, 0 otherwise	0.09 (0.29)
Central Europe	Dummy variable (=1) if the country is in Central Europe, 0 otherwise	0.16 (0.37)
Africa	Dummy variable (=1) if the country is in Africa, 0 otherwise	0.09 (0.29)
Asia	Dummy variable (=1) if the country is in Asia, 0 otherwise	0.12 (0.32)
Latin America	Dummy variable (=1) if the country is in Latin America, 0 otherwise	0.14 (0.35)
British legal origin	Dummy variable (=1) if the legal origin of the respondent is English, 0 otherwise (E)	0.28 (0.45)
French legal origin	Dummy variable (=1) if the legal origin of the respondent is French, 0 otherwise (A)	0.35 (0.48)
German Legal Origin	Dummy variable (=1) if the legal origin of the respondent is German, 0 otherwise (A)	0.07 (0.26)
Percent Muslim	Percent of Muslims in the country (A)	2.76 (7.43)
Percent Catholic	Percent of Catholics in the country (A)	44.26 (37.61)

Table 4.2 (continued)

Variable name	*Definition (source)*	*Mean (std. dev)*
Percent Protestant	Percent of Protestants in the country (A)	21.08 (27.64)
Low expropriation risk	Expropriation risk in the country (high values indicate low expropriation risk, or stronger institutions) (C)	8.49 (1.50)
Landlocked	Dummy variable (=1) if the country is landlocked (surrounded by land), 0 otherwise (B)	0.21 (0.41)
Latitude	Absolute latitude of the country (A)	0.43 (0.20)
Temperature	Average temperature of the country in Celsius (B)	12.88 (7.10)
Ethnolinguistic fragmentation	Ethnolinguistic fragmentation in the country (A)	0.23 (0.25)

Sources:
A La Porta *et al.* (1999).
B Parker (1997).
C McArthur and Sachs (2001).

rejected. When the specification omits the quadratic corruption term, but keeps the low expropriation risk (column 4), the coefficient of the linear corruption term remains insignificant. Low expropriation risk becomes of borderline significance in this specification (with a probability value of p=0.15), and it is significant in column 5 where corruption variables are omitted.

Panel B presents the results of the model where average corruption is replaced by government corruption. This variable is the weighted average of the proportion of the individuals who indicated that the bribe was solicited by a government or public official. Similarly, Panel C presents the results from the model where the Transparency International corruption perception index is regressed on the incidence of police corruption in the country, where police corruption is the weighted percentage of the individuals who were asked for a bribe by a police officer, given that a bribe was requested. The country averages of these corruption measures, which are reported in Table 4.2, are displayed again at the bottom of each panel. For example, in the 43 countries used in these regressions, in 30.08 percent of instances it was a government official who asked for a bribe, and in 31.73 percent of instances the perpetrator was a police officer.

Columns 1 and 2 of panels B and C indicate that increases in the extent of corruption in government offices and in police departments generate increases in the corruption perception of the country as measured by the (reversed) TI index. However, when the measure of institutional quality is added to the model, the significance of corruption variable disappears. Instead, institutional quality (as proxied by low expropriation risk) becomes a significant determinant of corruption perception. The same result is obtained in panels D, E and F where the TI corruption perception index is explained by customs corruption, inspector corruption, and corruption among others, respectively. The median estimate of the

Table 4.3a The determinants of corruption perception index; (dependent variable: Transparency International corruption measure). Instrumental variables estimation

		Coefficient (std. err.)	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*
		1	*2*	*3*	*4*	*5*
	Average corruption	0.177**	0.73*	0.09	–0.038	–
		(0.056)	(0.311)	(0.315)	(0.182)	
	(Average corruption)^2	–	–0.023	–0.004	–	–
			(0.016)	(0.011)		
A	Low expropriation risk	–	–	–1.709	–1.947	–1.775**
				(1.157)	(1.172)	(0.603)
	F	–	8.95	0.09	–	–
	p-value		(0.016)	(0.918)		
	Mean (std.) of average corruption	6.771	6.771	6.771	6.771	6.771
		(9.090)	(9.090)	(9.090)	(9.090)	(9.090)
	Government corruption	0.019**	0.289**	0.173	0.001	–
		(0.007)	(0.08)	(0.203)	(0.048)	
	(Government corruption)^2	–	–0.003***	–0.002	–	–
			(0.001)	(0.002)		
B	Low expropriation risk	–	–	–1.136	–1.77**	–1.775**
				(1.116)	(0.574)	(0.603)
	F	–	(6.96)	0.40	–	–
	p-value		0.0273	(0.684)		
	Mean (std.) of government corruption	30.076	30.076	30.076	30.076	30.076
		(26.685)	(26.685)	(26.685)	(26.685)	(26.685)
	Police corruption	0.09	0.296**	0.078	–0.062	–
		(0.05)	(0.106)	(0.337)	(0.13)	
	(Police corruption)^2	–	–0.005	–0.003	–	–
			(0.006)	(0.008)		
C	Low expropriation risk	–	–	–1.923	–2.282	–1.775**
				(2.308)	(1.402)	(0.603)
	F	–	4.39	0.06	–	–
	p-value		(0.067)	(0.946)		
	Mean (std.) of police corruption	31.730	31.730	31.730	31.730	31.730
		(21.669)	(21.669)	(21.669)	(21.669)	(21.669)
	Custom corruption	–0.032**	0.549	0.255	0.046	–
		(0.011)	(0.487)	(0.387)	(0.078)	
	(Custom corruption)^2	–	–0.016	–0.006	–	–
			(0.014)	(0.011)		
D	Low expropriation risk	–	–	–1.72**	–2.317**	–1.775**
				(0.607)	(0.799)	(0.603)
	F	–	0.65	0.29	–	–
	p-value		(0.557)	(0.756)		
	Mean (std.) of custom corruption	12.938	12.938	12.938	12.938	12.938
		(14.310)	(14.310)	(14.310)	(14.310)	(14.310)
	Inspector corruption	–0.106*	–0.035	–0.073	–0.07	–
		(0.045)	(0.064)	(0.112)	(0.09)	

Table 4.3a (continued)

		Coefficient (std. err.)	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*
		1	*2*	*3*	*4*	*5*
	(Inspector corruption)^2	–	–0.002 (0.003)	0 (0.005)	–	–
E	Low expropriation risk	–	–	–1.686 (0.94)	–1.678** (0.644)	–1.775** (0.603)
	F	–	2.20	0.48	–	–
	p-value		(0.192)	(0.640)		
	Mean (std.) of inspector corruption	8.444 (11.384)	8.444 (11.384)	8.444 (11.384)	8.444 (11.384)	8.444 (11.384)
	Other corruption	0.001 (0.026)	0.182 (0.134)	0.095 (0.143)	–0.022 (0.061)	–
	(Other corruption)^2	–	–0.006 (0.006)	–0.004 (0.006)	–	–
F	Low expropriation risk	–	–	–1.474** (0.431)	–1.805** (0.64)	–1.775** (0.603)
	F	–	1.14	0.23	–	–
	p-value		(0.381)	(0.802)		
	Mean (std.) of other corruption	16.813 (16.202)	16.813 (16.202)	16.813 (16.202)	16.813 (16.202)	16.813 (16.202)
	N	43	43	43	43	43

Notes Linear and quadratic corruption and low expropriation risk are endogenous. Regressions also include region and legal origin dummies and religion variables. Standard errors are in parentheses. They are adjusted for clustering at the region level. * signifies statistical significance at the 10 percent level; ** at the 5 percent level, and *** at the 1 percent level or less.

coefficient of low expropriation risk within the panels of Table 4.3a is about –1.7. This means that a 10 percent decline in the risk of expropriation in the country generates an improvement in the corruption perception of the country by 1.42 on the TI scale, which is 56 percent of a standard deviation.

Table 4.3b presents the results of the same regressions as Table 4.3a, with one difference: the dependent variable is the reversed-World Bank corruption measure. The same pattern is observed in this table as in Table 4.3a. The quality of the institutions of the country, as measured by the risk of expropriation, influences the corruption perception about the country; but holding constant the quality of institutions, the extent of actual corruption has no direct impact on corruption perception. The World Bank scale is narrower than the Transparency International index, ranging from 0 to 3.38. The median estimate of the impact of institutions within each panel is about –0.5, which means that a 10 percent decline in the risk of expropriation in the country generates an improvement in the corruption perception of the country by 0.42 on the World Bank scale, which is 40 percent of a standard deviation of the World Bank index.

Table 4.3b The determinants of corruption perception index (dependent variable: World Bank corruption measure). Instrumental variables estimation

		Coefficient (std. err.)	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*
		1	*2*	*3*	*4*	*5*
	Average corruption	0.095* (0.04)	0.246** (0.088)	0.097 (0.148)	0.049 (0.035)	–
	(Average corruption)^2	–	–0.006 (0.004)	–0.002 (0.004)	–	–
A	Low expropriation risk	–	–	–0.339 (0.295)	–0.427 (0.269)	–0.647** (0.253)
	F	–	5.32	1.39	–	–
	p–value		(0.047)	(0.320)		
	Mean (std.) of average corruption	6.710 (8.993)	6.710 (8.993)	6.771 (9.090)	6.771 (9.090)	6.771 (9.090)
	Government corruption	0.002 (0.017)	0.096*** (0.026)	0.036 (0.055)	–0.011 (0.012)	–
	(Government corruption)^2	–	–0.001*** (0.00)	–0.001 (0.001)	–	–
B	Low expropriation risk	–	–	–0.512 (0.272)	–0.687** (0.241)	–0.647** (0.253)
	F	–	31.64	2.43	–	–
	p–value		(0.001)	(0.169)		
	Mean (std.) of government corruption	30.037 26.374	30.037 26.374	30.076 (26.685)	30.076 (26.685)	30.076 (26.685)
	Police corruption	0.033 (0.027)	0.125 (0.072)	0.077 (0.137)	–0.012 (0.026)	–
	(Police corruption)^2	–	–0.002 (0.004)	–0.002 (0.002)	–	–
C	Low expropriation risk	–	–	–0.516 (1.446)	–0.747 (0.396)	–0.647** (0.253)
	F	–	2.46	0.48	–	–
	p–value		(0.166)	(0.643)		
	Mean (std.) of average corruption	31.284 (21.619)	31.284 (21.619)	31.730 (21.669)	31.730 (21.669)	31.730 (21.669)
	Customs corruption	–0.012 (0.013)	0.278 (0.203)	–0.023 (0.138)	0.025 (0.022)	–
	(Customs corruption)^2	–	–0.009 (0.006)	0.001 (0.004)	–	–
D	Low expropriation risk	–	–	–1.079 (0.747)	–0.942** (0.321)	–0.647** (0.253)

Table 4.3b (continued)

		Coefficient (std. err.)	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*	*Coefficient (std. err.)*
		1	*2*	*3*	*4*	*5*
	F	–	1.09	0.40	–	–
	p–value		(0.395)	(0.685)		
	Mean (std.) of custom corruption	13.718 (15.059)	13.718 (15.059)	12.938 (14.309)	12.938 (14.309)	12.938 (14.309)
	Inspector corruption	–0.045 (0.025)	–0.002 (0.02)	–0.021 (0.037)	–0.044 (0.033)	–
	(Inspector corruption)^2	–	–0.001 (0.001)	–0.001 (0.002)	–	–
E	Low expropriation risk	–	–	–0.528 (0.307)	–0.586** (0.233)	–0.647** (0.253)
	F	–	1.73	1.35	–	–
	p–value		(0.254)	(0.329)		
	Mean (std.) of inspector corruption	8.410 11.253	8.410 11.253	8.444 11.384	8.444 11.384	8.444 11.384
	Other corruption	0.01 (0.025)	0.081 (0.043)	0.065 (0.041)	0.019 (0.029)	–
	(Other corruption)^2	–	–0.002 (0.002)	–0.002 (0.001)	–	–
F	Low expropriation risk	–	–	–0.491* (0.212)	–0.621** (0.243)	–0.647** (0.253)
	F	–	1.86	1.27	–	–
	p–value		(0.235)	(0.348)		
	Mean (std.) of other corruption	16.551 (16.107)	16.551 (16.107)	16.813 (16.202)	16.813 (16.202)	16.813 (16.202)
	N	44	44	43	43	43

Notes Linear and quadratic corruption and low expropriation risk are endogenous. Regressions also include region and legal origin dummies and religion variables. Standard errors are in parentheses. They are adjusted for clustering at the region level. * signifies statistical significance at the 10 percent level; ** at the 5 percent level, and *** at the 1 percent level or less.

These results show that the perception of corruption formed about a country is influenced by the quality of the institutions in that country. Once the level of institutional quality is controlled for, the extent of actual corruption in the country or the extent of corruption in various government offices (police, customs officers, etc.) do not have a direct impact on corruption perception.

4.5 Growth and corruption

In this section I re-visit the corruption-growth relationship documented by Mauro (1995). In light of the results of the previous sections, it is important to investigate whether the previously documented relationship between corruption and growth is a causal one. Mocan (2008) shows that institutional quality has an impact on the extent of corruption, as measured by the propensity of being asked for a bribe. Given the results of the previous section that institutional quality also impacts the perception of corruption about a country, and given the evidence that institutions impact growth (Acemoglu, Johnson and Robinson, 2001), it is conceivable that the corruption-growth relationship is a correlation which emerges in models that do not control for institutions. This is an important issue with potentially significant policy implications. If corruption has a direct causal impact on growth, efforts can be directed to corruption control and deterrence. On the other hand, if institutions have an impact on growth, then efforts should be focused on institutional reforms.

For each country in the data set, the average annual growth in per capita GDP between 1975 and the year of the survey (typically 1995) is calculated. For the countries where the survey is conducted in multiple years, the year closest to 1995 is chosen. For many Eastern European countries GDP data are not available in 1975; thus such countries cannot be included in this analysis. The average value of annual income growth in the sample of countries is 1.7 percent. The highest average annual growth during this two-decade period is in Botswana with 4.8 percent, and the two negative average annual growth rates are observed in South Africa and Bolivia, with –0.2 percent and –0.055 percent respectively.

In addition to geographic location indicators, legal origin measures and religious composition variables, the growth regressions include dichotomous variables to indicate the presence of a war and whether the country has a federal structure. War is a dichotomous variable that takes the value of one if a war occurred from the 1960s to 1980s, and zero otherwise. This variable is obtained from McArthur and Sachs (2001). Federal status is a dichotomous variable that takes the value of one if at least two levels of government rule the same land and people, each level has at least one area of action in which it is autonomous, there is some guarantee of the autonomy of each government; and zero otherwise. This variable is obtained from Treisman (2000). Also included are average education in the country in 1975 as a measure of human capital at the beginning of the period where growth is analyzed, and real per capita GDP in 1975 (initial GDP).[5] In order to investigate the direct impact of corruption on growth, net of the impact of the quality of institutions, the regressions also include expropriation risk as a regressor.[6] As before, regressions are estimated with instrumental variables where the corruption and expropriation risk are instrumented by the absolute latitude of the country, average temperature in the country, an indicator variable which takes the value of one if the country is landlocked, and the extent of ethnolinguistic fragmentation of the country.

Table 4.4 displays the results from five different regressions. In column 1, linear and quadratic corruption measures are included along with low expropriation risk. The coefficients have the theoretically predicted signs, where increased corruption

has a detrimental effect on growth, and low expropriation risk increases growth. However, neither variable is statistically significant, although all three are jointly significant with an F-statistic value of 11.35 (probability, p=0.007). The hypothesis that corruption variables are jointly zero cannot be rejected (F-statistic=0.65, p=0.55). Column 2 presents the results where economic growth is explained by linear and quadratic corruption variables, but the expropriation risk is omitted from this specification. In this case, corruption variables are jointly significant (F-statistic=22.2, p=0.002). Column 3 contains the results from the model where only the linear corruption term is included, which shows that the estimated impact of corruption is not statistically significant. In Column 4 we see that reduced risk of expropriation has a positive and statistically significant impact on growth when it is incorporated into the model with no corruption measures. Column 5 demonstrates that the corruption measure has no statistically significant impact on growth when included along with low expropriation risk. In this specification, the expropriation risk variable is not statistically significant at conventional levels with a probability value of 0.13.

The regressions in Table 4.4 are based on 30 observations, which imply 10–12 degrees of freedom. To increase the precision of the estimates, regressions with various alternative specifications are estimated, as reported in Table 4.5. Column 1 omits the region dummies. In column 2, both region indicators and legal origin dummies are dropped. Column 3 presents the results from a regression which does not include region, legal origin, war or federal government indicators. Finally, column 4 displays the results from a regression where only legal origin indicators are omitted. In all cases the coefficient of corruption is statistically insignificant and the point estimate is close to zero. The expropriation risk, on the other hand, remains statistically significant with almost no change in the point estimate.

Table 4.6 performs the same exercise excluding developed economies. More specifically, columns 1–3 display the results of the regressions that use data from 19 countries in central Europe, Latin America, Asia, Africa and the Mediterranean. Columns 4–5 report the results based on the sample which excludes the Mediterranean countries and Japan in addition to North America, Australia and Western Europe. Although the sample size gets smaller in these regressions, the coefficient of low expropriation risk remains statistically significant, and the point estimate is around 0.009, which is similar to the one observed in Tables 4.4. and 4.5. The coefficient of corruption, on the other hand, is never significant. The use of two corruption perception indices (TI and WB), instead of the corruption index employed in this paper, did not change the results. These indices were not significant determinants of growth even in the models which did not contain expropriation risk.

In summary, the results displayed in Table 4.6 indicate that when included jointly with the expropriation risk, corruption does not have a direct impact on economic growth. This suggests that the effect of corruption on growth is because of the impact of institutions on corruption. As shown by Mocan (2008), weak institutions cause corruption. Here we show that weak institutions impede economic growth, but once the quality of institutions is controlled for, there is no direct impact of corruption on growth.

Table 4.4 Determinants of growth dependent variable: average annual growth 1975–1995; instrumental variables estimation

	1	*2*	*3*	*4*	*5*
Corruption	–0.007	–0.006	–0.002	–	–0.001
	(0.014)	(0.005)	(0.002)		(0.002)
Corruption^2	0.0002	0.0001	–	–	–
	(0.0004)	(0.0002)			
Low expropriation risk	–0.001	–	–	0.01**	0.007
	(0.02)			(0.004)	(0.004)
Western Europe	–0.003	–0.005	–0.004	–0.02	–0.013*
	(0.018)	(0.01)	(0.004)	(0.012)	(0.005)
Central Europe	–0.001	–0.006	–0.018	–0.044	–0.034
	(0.069)	(0.02)	(0.013)	(0.025)	(0.021)
Africa	–0.023	–0.021	–0.011	–0.01	–0.007
	(0.062)	(0.032)	(0.013)	(0.02)	(0.016)
Latin America	0.028	0.023	0.014	–0.027	–0.004
	(0.049)	(0.027)	(0.033)	(0.023)	(0.027)
Asia	–0.021	–0.022	–0.02*	–0.028	–0.024
	(0.018)	(0.02)	(0.01)	(0.021)	(0.014)
Mediterranean	–0.009	–0.011	–0.005	–0.029	–0.018
	(0.014)	(0.016)	(0.017)	(0.028)	(0.018)
British legal origin	–0.004	–0.006	–0.014	–0.021	–0.02
	(0.048)	(0.026)	(0.023)	(0.022)	(0.025)
French legal origin	–0.007	–0.008	–0.01	–0.009	–0.013
	(0.047)	(0.04)	(0.035)	(0.018)	(0.03)
German legal origin	–0.005	–0.006	–0.008	–0.007	–0.01
	(0.044)	(0.038)	(0.039)	(0.026)	(0.036)
Percent Muslim	0.001	0.001	0.002	(0.0004)	0.001
	(0.002)	(0.002)	(0.001)	(0.0003)	(0.001)
Percent Catholic	–0.0003	–0.0002	–0.0003	–0.0001	–0.0001
	(0.0004)	(0.0002)	(–0.0002)	(0.0002)	(0.0002)
Percent Protestant	–0.0002	–0.0002	–0.0003	–0.0002	–0.0003
	(0.0005)	(0.0004)	(0.0003)	(0.0002)	(–0.0003)
War	0.006	0.005	–0.003	–0.002	0.0001
	(0.02)	(0.013)	(0.009)	(0.009)	(0.008)
Initial GDP	0.012	0.01	0.011	–0.001	0.004
	(0.008)	(0.011)	(0.008)	(0.003)	(0.008)
Federal	–0.002	–0.002	–0.001	–0.003**	–0.002*
	(–0.002)	(0.002)	(0.002)	–0.0007	(0.001)
Average education in 1975	–0.004	–0.004	–0.002	–0.001	–0.001
	(0.009)	(0.003)	(0.004)	(0.003)	(0.004)
Constant	0.117	0.103**	0.079	–0.003	0.023
	(0.226)	(0.029)	(0.044)	(0.043)	(0.075)
No. of observations	30	30	30	30	30

Notes Linear and quadratic corruption variables and expropriation risk are endogenous. Standard errors are adjusted for clustering at the region level. The mean value of initial GDP (per capita income in 1975) in the sample of 30 countries is 9.23 (in $1,000s). The mean value of average education in 1975 is 5.73.

Table 4.5 Determinants of growth dependent variable: average annual growth 1975–1995; instrumental variables estimation

	1	*2*	*3*	*4*
Corruption	0.0001	–0.00003	–0.0003	–0.001
	(0.001)	(0.0005)	(0.001)	(0.001)
Low expropriation risk	0.010**	0.007***	0.007**	0.011**
	(0.003)	(0.002)	(0.002)	(0.003)
Western Europe	–	–	–	–0.007
				(0.005)
Central Europe	–	–	–	–0.014
				(0.011)
Africa	–	–	–	–0.001
				(0.018)
Latin America	–	–	–	–0.0004
				(0.013)
Asia	–	–	–	–0.011
				(0.015)
Mediterranean	–	–	–	–0.013
				(0.014)
British legal origin	0.007	–	–	–
	(0.007)			
French legal origin	0.003	–	–	–
	(0.008)			
German legal origin	0.006	–	–	–
	(0.008)			
Percent Muslim	0.0005	0.001**	0.001*	0.001
	(0.0003)	(0.0002)	(0.0003)	(0.001)
Percent Catholic	–0.00001	–0.0001	–0.00003	–0.00002
	(0.0001)	(0.0001)	0.0001	0.0001
Percent Protestant	0.00002	–0.00004	–0.00004	–0.0001
	(0.00004)	(0.00004)	(0.0001)	0.0002
War	–0.004	–0.007	–	0.001
	(0.013)	(0.013)		(0.007)
Federal	–0.002***	–0.002*	–0.001	–0.002**
	(0.0005)	(0.001)	(0.001)	(0.001)
Initial GDP	–0.0005	0.003	–	–0.0005
	(0.006)	(0.005)		(0.006)
Average education in	–0.0003	–0.001	–0.001	–0.0004
1975	(0.001)	(0.001)	(0.001)	(0.002)
Constant	–0.047	–0.019	–0.023	–0.036
	(0.026)	(0.013)	(0.017)	(0.045)
No. of observations	30	30	30	30

Notes Linear and quadratic corruption variables and expropriation risk are endogenous. Standard errors are adjusted for clustering at the region level. The mean value of initial GDP (per capita income in 1975) in the sample of 30 countries is 9.23 (in $1,000s). The mean value of average education in 1975 is 5.73.

Table 4.6 Determinants of growth dependent variable: average annual growth 1975–1995; instrumental variables estimation

	Excluding developed countries			*Excluding developed and Mediterranean countries*		
	1	*2*	*3*	*4*	*5*	*6*
Corruption	–0.0004	–0.001	–0.0002	–0.0003	–0.0003	–0.0003
	(0.0004)	(0.001)	(0.001)	(0.0003)	(0.001)	(0.001)
Expropriation risk	0.009**	0.009**	0.009*	0.008	0.011**	0.011**
	(0.002)	(0.003)	(0.004)	(0.005)	(0.003)	(0.003)
Percent Muslim	0.0004*	0.001	–	0.0005	0.0004	–
	(0.0002)	(0.0004)		(0.0003)	(0.0004)	
Percent Catholic	–0.0001	–0.0005	–	–0.0001	–0.00002	–
	(0.0001)	(0.0001)		(0.0001)	(0.0002)	
Percent Protestant	–0.0004	–0.0004	–	–0.0004	–0.0003	–
	(0.0002)	(0.0003)		(0.0002)	(0.0003)	
War	0.001	–	–	–0.002	–	–
	(0.009)			(0.009)		
Federal	–0.004	–	–	–0.004	–	–
	(0.011)			(0.013)		
Initial GDP	–0.002	–0.003**	–0.003**	–0.001	–0.002	–0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Average education	–0.002	–0.002	–0.002***	–0.003	–0.003	–0.003**
in 1975	(0.001)	(0.001)	(0.0004)	(0.002)	(0.002)	(0.001)
Constant	–0.02	–0.017	–0.028	–0.011	–0.037**	–0.033
	(0.019)	(0.036)	(0.033)	(0.028)	(0.009)	(0.035)
No. of observations	19	19	19	16	16	16

Notes Linear and quadratic corruption variables and expropriation risk are endogenous. Standard errors are adjusted for clustering at the region level. The mean value of initial GDP (per capita income in 1975) in the sample of 19 countries is 5.47 (in $1,000s). The mean value of average education in 1975 is 4.15. The mean value of initial GDP in the sample of 16 countries is 4.45, and the mean of average education in 1975 is 4.14.

The point estimates in Tables 4.4–4.6 imply that a 1/2-standard deviation improvement in the quality of institutions (0.81 units) generates an increase in the average annual per capita GDP growth rate by about 0.7 percentage points. Another way to put this magnitude in perspective would be to consider two otherwise similar countries with per capita incomes of $2,500 in 1975. Assume that the first country's level of institutional quality is one-half standard deviation below that of the second country (which is akin to the case of Indonesia and India). Real per capita income of the first country is expected to rise to $3,500 by 1995, while per capita income in the country with one-percentage point less corruption would be about $4,000.

4.6 Are Middle East and North Africa different?

The relevant question now is whether countries in the Middle East and North Africa (MENA) region are structurally different than those in the sample considered in this

chapter. As the other chapters in this volume document in greater detail, MENA countries are typically characterized by low level of economic development, high corruption, weak judiciary and poor governance, attributes commonly observed in other developing nations. Many developing countries in Asia, Africa and South America indeed lack an independent or efficient judicial system, and have poor governance and high corruption. One distinguishing feature of MENA countries, though, could be the dominance of Islam in most of the region. Then, results reported for other countries so far in this chapter may not be relevant for MENA countries where Islam is the dominant religion.

It has been argued that Islam shaped institutions in those countries in such a way that they became barriers to development (Kuran, 2004) but what kind and how large an effect Islam exerts on the institutional structure of a country where it is the dominant religion is essentially an empirical question. Admittedly, religion, and Islam in particular, could affect the institutional structure of a country in many ways – including the way the legal framework is set up and the judicial system operates, even how bequests are allocated to survivors. Rather than delving into this broader question, I discuss below whether Islam has a direct impact on corruption net of its potential indirect impact through institutions or not in reference to findings in previous papers including one of my own. In Mocan (2004), I investigated the factors that influence an individual's propensity for being asked for a bribe and showed that controlling for a host of personal characteristics (such as age, education, gender, etc.), and a large set of country attributes (such as institutional quality, legal origin, unemployment rate, etc.), individuals who live in countries with a larger proportion of Muslim population are at higher risk of being asked for a bribe. Specifically, if the proportion of Muslims in the country goes up by 10 percentage points, this increases the risk of being asked for a bribe by 0.3 to 1 percentage points. This finding suggests a direct impact of religion on corruption, conditional on other country attributes, including measures of institutional structure. However, the magnitude of the impact is not large in comparison to some other country characteristics. For example, uninterrupted democracy in the country, exposure to a war and legal origin have larger impacts on the propensity for being asked for a bribe. In light of this evidence, it is difficult to suggest that some cultural effect, captured by Islam, has a substantial direct impact on corruption propensity.

In another interesting paper, Fisman and Miguel (2006) investigate the inter-relationship between corruption and cultural norms. They employ data from the New York Police Department pertaining to parking violations of foreign diplomats who reside in New York City. Diplomats, like everybody else, receive tickets from the police for parking violations, but because of their diplomatic immunity, they were not obligated to pay any fines before November 2002. This structure allows for an observation of behavior when the price of illegal parking is zero. The question is whether diplomats from different countries have differential social norms (represented by attitudes towards breaking the rules), and whether such difference is related to the extent of corruption in their home country. The data reveal that there is huge variation in the extent to which diplomats disregard the

parking rules. For example, over the period between November 1997 to November 2002, diplomats from Kuwait received 246.2 parking violation tickets per diplomat, while diplomats from Japan received none (Fisman and Miguel, 2006). Although the authors report a positive relationship between violations per diplomat and corruption in the country, there is substantial heterogeneity, especially for MENA countries. The analysis by Fisman and Miguel (2006) is based on 146 countries including 17 from the MENA region. The top 25 percent (37 countries) includes seven MENA countries: Kuwait (first with most violations per diplomat), Egypt (second), Morocco (13th), Syria (16th), Bahrain (21st), Saudi Arabia (27th) and Algeria (31st). On the other hand, there are four MENA countries in the bottom 25 percent: Lebanon (155th with 1.3 violations per diplomat), United Arab Emirates (127th), Oman (143rd), and Turkey (146th). Iran with 15.7 violations per diplomat does not look much different from Italy which recorded 14.6 violations per diplomat; Yemen's 9.1 violations are the same as Venezuela, and Djibouti with 6.5 violations per diplomat is only slightly worse than France with 6.1.

For the 17 MENA countries, the average number of violations per diplomat is 38.50, and the median is 15.7. African countries, excluding the MENA countries, have a mean of 30.65 and a median of 18.4. This suggests that MENA countries do not look much different from non-MENA African countries in this regard. Table 3 in Fisman and Miguel (2006) shows that countries in the Middle East registered more violations per diplomat in comparison to North America; but the same is true for countries in Africa, Asia, Europe, Latin America and Oceania, with similar magnitudes, suggesting once again that there is no obvious reason to assume that MENA countries as a group are culturally different in terms of social norms with regard to law-breaking.

As a final exercise, I used data reported in Fisman and Miguel (2006) for 17 MENA countries. In the same vein as Fisman and Miguel (2006), I plotted the log of (1+violations per diplomat) versus the corruption index employed in that paper (Kaufmann, *et al.*, 2005), where higher values indicate higher corruption. I fit quadratic OLS regressions and the predicted values are displayed along with actual data in Figure 4.4. Because Kuwait is a major outlier the regressions were run with and without Kuwait (although neglecting Kuwait is not advisable as it contains real information). The dashed line represents the predicted values using the entire sample, and the solid line pertains to the case where Kuwait is omitted. In the full sample, there is no significant relationship between violations per diplomat and the extent of corruption perception in the home country as measured by the Kaufmann index: both linear and quadratic term coefficients are not significantly different from zero, as can be deduced from the dashed line. Although not advisable, omitting Kuwait (the country with the highest level of violations in the graph) provides a better fit, but generates a counter-intuitive result: higher corruption perception is associated with an increase in violations per diplomat at low levels of corruption, but as the level of corruption perception gets higher, violations per diplomat decline. Thus, diplomats' parking violations in New York City, which can be considered as a representation of corruption norms in the home countries of these diplomats, are not meaningfully related to perception of the level of corruption in

MENA countries. Estimating linear models, instead of quadratic ones, produced insignificant associations between the two variables. These arguments, taken together, indicate that there is no compelling reason to assume that countries in the MENA region are structurally different from other developing nations because of religious or cultural differences that impact the culture of corruption.

4.7 Conclusion

This chapter addressed two issues: (i) what determines the perception of the extent of corruption in a country? and (ii) does corruption have a direct impact on growth when the quality of the institutions is controlled for? The paper develops an index which measures the extent of corruption as revealed by citizens who live in those countries. Exposure to corruption is defined as having been asked for a bribe by a government official, such as a government worker, customs officer, police officer, or inspector in that country. The country-level corruption indicator created in this paper is the proportion of individuals in a country who were asked for a bribe in the year before they were surveyed. This is the first direct measure of corruption created in this literature, which gauges how wide-spread corruption is in the country. This measure is shown to be highly correlated with widely-used corruption *perception* indices such as those generated by Transparency International (TI) and the World Bank (WB). 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.

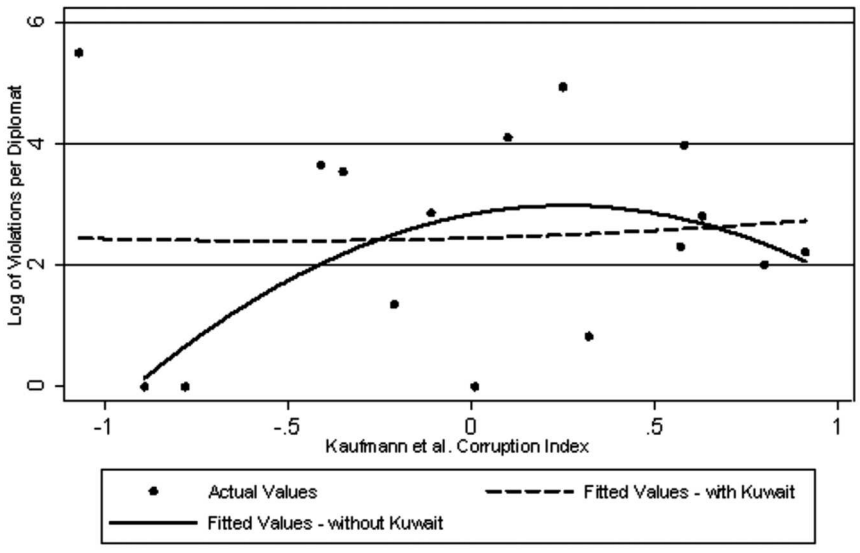

Figure 4.4 Parking violations in NYC vs corruption in country of residence: the case of MENA countries.

To investigate how the perception of the extent of the corruption in a country is formed, country-level regressions are run where Transparency International and the World Bank corruption perception indices are regressed on a number of country characteristics. These include the extent of actual corruption in the country (and its components, such as police corruption, government corruption, etc.), as well as the institutional quality of the country. Controlling for endogeneity of corruption and institutional quality, it is shown that actual corruption in a country and the proportion of bribes asked by various government agencies have no direct impact on corruption perception. On the other hand, an improvement in the quality of institutions lowers the perception of corruption. Specifically, a 10 percent decline in the risk of expro-priation in the country generates an improvement in the corruption perception of the country by about 60 percent of a standard deviation of the TI corruption perception index, and by a 40 percent standard deviation of the WB corruption perception index. These findings suggest that concentrating efforts on reforming the institutions of a country is an effective method of influencing perceptions of the extent of corruption in that country.

Earlier research has argued that corruption is negatively correlated with development (Mauro, 1995). Another line of research has demonstrated that weak institutions cause macroeconomic volatility and slower economic growth (Acemoglu, Johnson, and Robinson, 2001; Acemoglu, Johnson, Robinson and Thaicharoen, 2003). Given the results in Mocan (2008) which show that institutional quality influences corruption, it is important to re-investigate the link between corruption and growth in a model that accounts for the quality of institutions in a country. The analysis in the final section of the paper shows that the strength of institutions in a country (as measured by low risk of expropriation) improves its rate of economic growth. However, controlling for the quality of the institutions, corruption does not have a direct impact on growth. It cannot be ruled out that this result is specific to the period of analysis (1975–1995) or to the countries in the data set. But it suggests that the documented association between corruption and growth is likely due to the omitted influence of institutions on corruption. Keeping constant the geographical location of a country, its legal origin, religious composition, the incidence of wars, federal status, initial education and income as well as the extent of corruption, a one-half standard deviation increase in the quality of institutions (e.g. from the level of Indonesia to the level of India), generates an additional 0.7 percentage point increase in the average annual per capita GDP growth. For a developing country with a per capita income of 2,500 dollars in 1975, this translates into an additional 500 dollars in per capita income by 1995. The data include a wide range of developing and developed countries, and as argued in the previous section, the results obtained from the empirical analyses should be generally applicable to countries in the MENA region, as the observable differences (such as Islam being the dominant religion) between these countries and some other developing nations do not seem to be the root cause of high corruption, or a culture of corruption, more generally.

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