

ECONOMIC FREEDOM, CORRUPTION, AND GROWTH

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This article adds to the empirical literature on the relationship between corruption and economic growth by incorporating the impact of economic freedom. We utilize an econometric model with two improvements on the previous literature: (1) our model accounts for the fact that economic growth, corruption, and investment are jointly determined, and (2) we include economic freedom explicitly as an explanatory variable. Using a panel of 60 countries, we find that for countries with low economic freedom (where individuals have limited economic choices), corruption reduces economic growth. However, in countries with high economic freedom, corruption is found to increase economic growth. Our results contradict the generally accepted view that corruption lowers the rate of growth. We use Osterfeld's (1992) distinction between *expansive* and *restrictive* corruption to explain our results. According to Osterfeld, corruption expands output if more bribes help the economy move toward greater free exchange. Thus, in economies where economic freedom is high, if bribing makes public officials less diligent in enforcing restrictions on firms' activities, output will increase. However, corruption will restrict output when bribes reduce competition and increase market rigidities. This outcome is more likely in countries where economic freedom is low due to widespread state ownership of assets (e.g., in China), monopolies and high tariff barriers granted to businesses owned by ruling elites and their cronies (e.g., the Philippines under Marcos and Indonesia under Suharto), and state-run marketing boards that are often the sole purchasers of agricultural products

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(e.g., in several African countries). An increase in corruption in these low economic freedom countries means even less competition and free exchange and leads to a fall in output. The policy implication of our finding is straightforward: The surest way to mitigate corruption and its adverse effects is to increase economic freedom.

Private property rights need to be better protected if economic freedom is to increase. The protection of the right to one's person and property and the right to make choices about their disposition are the essence of economic freedom. When allocative decisions are made in a system where economic freedom is strong, markets lead to an efficient outcome. Societies obviously do not use such a one-dimensional system of allocation. The political system restricts or augments the economic power of individuals or groups on the basis of society's expressed preferences for goals other than efficiency.

We define corruption as the use of public office for private gain. It occurs at the fault line between the society's pursuit of the expressed non-efficiency preferences and the outcome that would occur when economic freedom is complete. This fault line, however, is amorphous because individuals' desire for economic freedom and the benefits that flow from it leads them to circumvent government regulations that limit the scope of legal market transactions. Thus, corruption, as well as its economic effects, is conditioned by the degree of economic freedom that market participants enjoy.

Previous Studies

There is an extensive literature on the economic effects of corruption. In modeling the effect of corruption on economic growth, previous studies have used a neoclassical growth specification. The rationale is that physical capital, labor (population growth), human capital (education), and institutional variables (of which corruption is one) contribute to the steady-state per capita income level. Given the initial per capita income, the rates of growth of these variables determine the speed at which an economy converges to its steady state, which affects the growth rate of GDP.

There are two serious problems in examining the relationship between economic growth, economic freedom, and corruption. First, differences among countries (known as "time invariant heterogeneity" or "country fixed effects") in terms of religion, culture, and institutions have an important role in explaining cross-country differences in corruption (Triesman 2000) and the rate of growth (Islam 1995). We believe these country fixed effects are correlated with economic freedom. Second, corruption, investment, and the rate of economic

growth are simultaneously determined: The random shocks that affect the rate of economic growth may also simultaneously affect corruption, economic freedom, and other explanatory variables such as investment. Dawson (2003) shows that economic freedom is the result of growth rather than a cause of growth. Our review of the literature reveals that (a) the current body of empirical evidence on the effect of corruption on growth is based largely on cross-sectional models that cannot account for unobserved country-specific heterogeneity; (b) the degree of economic freedom in an economy is not considered explicitly; and (c) the simultaneity between corruption, investment, and economic growth is ignored.

Mauro (1995) is the seminal empirical work on the interaction between corruption and growth. He finds that much of the effects of corruption on growth take place indirectly, through the effect on investment. He also finds that when investment is controlled for, the direct effect of corruption on growth is weak. Mo (2001) presents evidence that corruption affects economic growth by lowering human capital accumulation and by undermining political stability. Pelligrini and Gerlagh (2004) add trade openness as an additional channel through which the effect of corruption on growth is transmitted.

Méon and Sekkat (2005) investigate the direct effect of corruption on economic growth while controlling for the quality of governance. Kaufmann, Kraay, and Zoido-Lobaton (1999) measure the quality of governance using an index based on the openness of the political system, the degree of political risk, the burden of regulatory controls, and the rule of law, and perceptions of the quality of public service provisions, the competence of the bureaucracy, and their independence. They address the following question: How does a distortion in the form of corruption (or an increase in the degree of corruption), on top of an existing distortion in the form of poor governance, affect growth? They find that corruption has a negative effect on economic growth and that the negative effect is stronger if governance is of poor quality. The policy implication is that reducing corruption would be more profitable in countries with poor governance.

In contrast to Méon and Sekkat, Houston (2007: 15) finds that in countries with poor governance, corruption helps to expand output and concludes, "Corruption should not be indiscriminately attacked in poorly governed countries." The econometric models used in these two articles are very different: Méon and Sekkat use a neoclassical growth specification while Houston neglects to include some fairly standard explanatory variables based on the previous literature (e.g., investment and population growth).

Mauro (1995), Mo (2001), Méon and Sekkat (2005), and Houston (2007) all use cross-sectional models and ignore the endogeneity of corruption and investment. In contrast, Ehrlich and Lui (1999) and Méndez and Sepúlveda (2006) use panel data to address the problem of the endogeneity of corruption through country fixed effects. However, neither work addresses the problem of simultaneity between corruption, investment, and the rate of growth. Ehrlich and Lui report that for a sample of 68 countries corruption affects the *level* of GDP but not economic growth. They treat corruption as exogenous. Using the categories “free” and “not free” (as determined by the index of political rights and civil liberties from Freedom House International), Méndez and Sepúlveda find that in “free” countries, corruption and growth are inversely and nonlinearly related. In countries that are “not free,” the relationship between corruption and economic growth is not statistically significant. To the best of our knowledge, Méndez and Sepúlveda (2006) is the only published article so far that investigates the interaction between corruption, economic freedom, and economic growth.¹

The Model

We specify our benchmark structural model as follows:

$$(1) \quad \log \text{GDP}_{i,t} = \alpha_0 + \alpha_1 \log \text{GDP}_{i,t-1} + \beta X_{i,t} + \alpha_2 \text{INV}_{i,t} + \alpha_3 C_{i,t} \\ + \alpha_4 \text{EF}_{i,t} + \mu_i + v_{i,t},$$

where GDP stands for gross domestic product, X is a set of control variables (primary and secondary school enrollment rates, annual population growth rate, size of government, and political stability), INV stands for investment, C stands for corruption, and EF stands for economic freedom. All explanatory variables, except INV and C , are uncorrelated with the error term ($v_{i,t}$). The unobserved country fixed effect is represented by μ . INV and C , and possibly other explanatory variables, are correlated with μ . The coefficients for corruption and economic freedom measure the level change in the logarithm of current year’s GDP (i.e., the change in growth of per capita income in percentage points) owing to a change in corruption, given last year’s GDP and other control variables. Unlike Méndez and Sepúlveda (2006), who separated their sample into “free” and “not free” countries (based on political rights and civil liberties), we explicitly include economic freedom in our model. To capture the manner in which the effect of corruption is conditional upon the level of economic freedom, we also include a multiplicative interactive term ($\text{CPI} \cdot \text{EFI}$).

¹However, see Houston (2007) and an unpublished working paper by Heckelman and Powell.

The Arrelano and Bond (1991) method (AB method) is specially suited for estimating this dynamic model for a panel of countries with data available for a short time span. To estimate equation 1 using the AB method, we take first differences:

$$(2) \quad \log\text{GDP}_{i,t} - \log\text{GDP}_{i,t-1} = \alpha_1(\log\text{GDP}_{i,t-1} - \log\text{GDP}_{i,t-2}) \\ + \beta(X'_{i,t} - X'_{i,t-1}) + \alpha_7(\text{INV}_{i,t} - \text{INV}_{i,t-1}) \\ + \alpha_8(C_{i,t} - C_{i,t-1}) + (v_{i,t} - v_{i,t-1}).$$

With μ_i eliminated, the AB method uses instrumental variables for each of the first differenced explanatory variables. To illustrate, consider equation 2 when $t = 3$:

$$(3) \quad \log\text{GDP}_{i,3} - \log\text{GDP}_{i,2} = \alpha_1(\log\text{GDP}_{i,2} - \log\text{GDP}_{i,1}) \\ + \beta(X'_{i,3} - X'_{i,2}) + \alpha_7(\text{INV}_{i,3} - \text{INV}_{i,2}) \\ + \alpha_8(C_{i,3} - C_{i,2}) + (v_{i,3} - v_{i,2}).$$

In equation 3, $\log\text{GDP}_{i,2} - \log\text{GDP}_{i,1}$ is correlated with the error term in difference $v_{i,3} - v_{i,2}$. The former term can be instrumented by $\log\text{GDP}_{i,1}$ because $\log\text{GDP}_{i,1}$ is correlated with $\log\text{GDP}_{i,2} - \log\text{GDP}_{i,1}$, and it is reasonable to assume that GDP in a year is unrelated to random shocks in the future (i.e., $\log\text{GDP}_{i,1}$ is predetermined). In the AB method, two-period lagged values instrument endogenous variables. Thus, $C_{i,1}$ is an instrument for $C_{i,3} - C_{i,2}$, and $\text{INV}_{i,1}$ is an instrument for $\text{INV}_{i,3} - \text{INV}_{i,2}$. Other instruments (for example, lagged saving for current investment), if known, can be added to the instruments' matrix. Finally, the variables that are strictly exogenous in $X'_{i,3} - X'_{i,2}$ can all act as instruments for themselves in levels.

The Data

Corruption occurs in secret and is not directly observable. Reliability of the measurement of corruption is therefore a key issue in any empirical study. A good measure must be able to convey the frequency and depth of corruption, and be comparable over time. Three measures of corruption are used in the literature: Transparency International's Corruption Perceptions Index (CPI), the World Bank's Control of Corruption Index (CCI), and the Corruption in Government index from the *International Country Risk Guide* prepared by the Political Risk Services, known as the ICRG index.

The CPI and the CCI are based on a number of separate surveys of businesses' perceptions of corruption, while the ICRG index is a ranking of countries on the basis of expert opinion about prevailing

corruption. Lambsdorff (2004a, 2004b) cautions that the ICRG index does not measure corruption; it indicates the political risk involved in corruption. Triesman (2000) finds some rankings by the ICRG index puzzling.

We use the CPI to measure corruption because the CPI is available annually while the CCI is available only every other year. The CPI ranges from 0 to 10. A low score means corruption is perceived to be high. The CPI data are available for a panel of countries for each year from 1994. A number of previous works use the CPI panel, for example, Gyimah-Brempong (2002), Gyimah-Brempong and de Comacho (2006), and Ganuza and Hauk (2001).

By economic freedom we mean the freedom to enter into voluntary exchanges without government interference, which means the protection of one's property rights. Two well-known indexes of economic freedom are the Economic Freedom of the World (EFW) Index prepared by the Fraser Institute and the Economic Freedom Index (EFI) prepared by the Heritage Foundation. Economic freedom and political freedom reflect the same fundamental values relating to personal choices. However, political freedom can coexist with a lack of economic freedom (e.g., India), and economic freedom can coexist with a lack of political freedom (e.g., Singapore). We use the EFI because it is available for a greater number of years. The EFI ranges from 0 to 100 (comprised of 10 components, each of which is scaled 0 to 10). A score of 0 signifies economic policies that provide the least freedom. A score of 100 means that economic agents have the most freedom. Because two of our independent variables of interest—corruption and government size—are each included as one of the 10 components of the EFI, we have calculated a modified EFI that excludes those two components. Our modified EFI ranges from 0 to 80.

Political stability is proxied by the durability of a government. Our political stability variable measures the number of years since the most recent regime change. If a regime is stable, then the political stability score will be higher by one point in each successive year. We expect that countries that have greater political stability over time, all else being equal, will also have stronger economic growth. The political stability measure is obtained from the Polity IV data base.²

Data on all other variables have been obtained from the World Bank's *World Development Indicators* database. The variable definitions are found in the Appendix. The summary statistics are also presented in the Appendix (in Table A1).

²See Marshall and Jaggers (2002) for a discussion of the Polity IV data base and the variable definitions.

Econometric Results

In Table 1 we present the estimates obtained by applying the AB method to the dynamic model specified in equation 1. As mentioned earlier, the AB method eliminates the unobserved country fixed effects by first differencing all variables and then uses the one-period lagged (level) values of the predetermined explanatory variables and the two-period lagged values of the endogenous explanatory variables (*INV* and *C* in our model) as instruments. Variables specified as additional instruments (lagged saving) are included, undifferenced, in the instruments' matrix.³ The validity of this model depends on whether there are enough instruments to identify our model. Also, the absence of second-order serial correlation in the error term is required for the estimates to be consistent. Thus, a good model has to pass two tests: first, the Sargan test of overidentifying restrictions and, second, a test for absence of second-order autocorrelation [AR(2)] in the error term.

The AB method provides one-step and two-step estimates of the coefficients. The two-step standard errors tend to be biased downward in the case of small samples (Baltagi 2001, StataCorp. 2003). Given the modest size of our sample (137 observations for 60 countries), only the first-step results are reported in Table 1.

The specification in column 1 includes the control variables, investment rate, and corruption as explanatory variables. The p-value for the null hypothesis of absence of AR(2) in the error term is 17 percent, which means that column 1 presents a consistent model. In column 2, the modified economic freedom index variable is added to the specification in column 1. The estimates are not consistent because the null hypothesis of the absence of AR(2) process in the error term is rejected at a 14 percent level of significance. Replacing the EFI with the interaction term for corruption and economic freedom as an explanatory variable (column 3) gives us the same p-value of 14 percent. When all three variables are included in column 4 (CPI, EFI, and CPI*EFI), the null hypothesis of the absence of AR(2) cannot be rejected at a conventional level of significance. All four models are significant and identified.

In column 4, the estimated elasticity of current real per capita GDP (0.73) with respect to its lagged value reveals a large degree of persistence of growth. The coefficient for primary education is not

³Levels lagged one or more periods may be used as instruments in case of predetermined variables. In case of endogenous variables, levels lagged two or more periods are available as instruments (Stata Corp. 2003).

TABLE 1
REGRESSION RESULTS: CORRUPTION AND ECONOMIC FREEDOM AS DETERMINANTS OF THE GROWTH RATE OF REAL PER CAPITA GDP

Variable	(1)	(2)	(3)	(4)	(5)
Corruption (CPI)	0.58	0.38	1.83	7.30**	—
Economic Freedom (EFI)	—	0.10	—	0.62**	0.25**
CPI×EFI	—	—	-0.03	-0.14**	—
Log of GDP per Capita lagged	78.86**	77.11**	80.44**	72.56**	77.71**
Primary Education	-0.01	-0.01	-0.004	-0.09	0.05
Secondary Education	-0.13	-0.17	-0.14	-0.18*	-0.08
Political Stability	0.09	0.09	0.09	0.09	0.11
Population Growth	-77.56*	-82.59**	-72.04	-69.92*	-50.74
Government Size	-0.12	-0.15	-0.14	-0.08	-0.10
Investment Rate	0.51**	0.52**	0.52**	0.53**	0.23**
Wald Test (p-value)	0.00	0.00	0.00	0.00	0.00
Sargan Test (p-value)	0.83	0.96	0.98	0.00	0.04
Absence of (AR2) (p-value)	0.17	0.14	0.14	0.17	0.30
Countries	60	60	60	60	82
Observations	138	137	137	137	213

NOTES: Coefficients reported after multiplication by 100; *significant at 10 percent; **significant at 5 percent.

significant while the coefficient for secondary education is, but it has the wrong sign. The effect of population growth is large and statistically significant: If population growth is higher by 1 percentage point, then per capita real GDP growth would be lower by 0.70 percentage point. The investment rate has a statistically significant positive effect on the growth rate.

When we regress the log of per capita GDP on the control variables and CPI, ignoring EFI and $\text{EFI} \times \text{CPI}$ (column 1), the coefficient for CPI is positive but not statistically significant. When we control for EFI and $\text{EFI} \times \text{CPI}$, the model (column 4) performs better, and the coefficient for CPI is significant with a positive sign. The results in column 4 suggest that a decrease in corruption (increase in CPI) will increase the rate of growth of per capita income. We also see that an increase in economic freedom raises the rate of growth of real per capita GDP and the coefficient is significant. Note that the coefficient of CPI is four times its size in column 3—that is, when the degree of economic freedom is held constant, a decrease in the incidence of corruption is more strongly growth augmenting. The partial effect of a change in the CPI on the rate of growth of per capita income on the basis of the results in column 4 is as follows:

$$(4) \quad \frac{\partial \log \text{ real GDP per capita}}{\partial \text{CPI}} = 7.30 - 0.14\text{EFI}.$$

In countries where the EFI is 52.15, a reduction in corruption (meaning an *increase* in the CPI) has no effect on the rate of growth (because the second term in equation 4 exactly offsets the first term). For countries where the EFI is less than 52.15, a reduction in corruption will increase economic growth. This growth-augmenting effect is increasing in the absence of economic freedom. In our sample, 38 of the 60 countries have an EFI less than 52.15 in each of the sample years. For the other 22 countries with higher economic freedom (i.e., $\text{EFI} > 52.15$), decreasing corruption will reduce economic growth, and this growth-reducing effect is increasing in economic freedom. This means that in countries where people have low economic freedom, controlling corruption will have growth benefits. However, if economic freedom is relatively high, then reducing corruption will lower the growth rate. These findings suggest that the growth consequence of corruption depends on the choices open to the people. If people have many choices (economic freedom high), they reach the most efficient allocation possible (given the few government restrictions that do exist) by bribing officials to look the other way rather than diligently enforce those restrictions. In this situation,

if the officials become more honest (lower corruption), then the policies in place are implemented more faithfully and growth is adversely affected. On the other hand, if government control of the economy is pervasive and people have very few choices (economic freedom low), a reduction in corruption by public officials releases resources and leads to a higher growth rate.

Osterfeld (1992) provides an explanation for this result: Corruption increases output if more bribes help the economy move toward greater free exchange. Thus, where economic freedom is high (e.g., Hong Kong), if public officials are less diligent in enforcing restrictions on firms' activities, output will increase. However, corruption will lower output when bribes reduce competition and increase market rigidities. This is more likely to happen in countries where economic freedom is low because state ownership of assets is more widespread, ruling elites and their cronies are granted monopolies and high tariff barriers, and state-run marketing boards are more likely to be the sole purchasers of agricultural products. An increase in corruption in these low-freedom countries is more likely to lead to a decline in output because it is more likely to be "restrictive" corruption that reduces competition and the amount of free exchange.

The model in column 4 of Table 1 can also be used to measure the partial effect of a change in economic freedom. The partial effect is as follows:

$$(5) \quad \frac{\partial \log \text{ real GDP per capita}}{\partial \text{EFI}} = 0.62 - 0.14\text{CPI}.$$

Equation 5 indicates that for a given incidence of corruption, the rate of growth of real per capita income is increasing with the degree of economic freedom. The positive growth effect of an increase in economic freedom is increasing with the incidence of corruption (high corruption means a low CPI). Thus, in a country where corruption is at its highest (CPI = 0), an increase in economic freedom will be growth augmenting. On the other hand, in countries where corruption is relatively low (values for CPI > 4.43), an increase in economic freedom actually reduces growth of real per capita income. Such a paradoxical relationship between economic freedom and growth can arise because the relationship between freedom and corruption is not uniform across countries (Graeff and Mehlkop 2003). For example, if more freedom is in the form of broadening a country's financial linkage with the rest of the world, it may actually foster corruption and reduce growth.

Equations 4 and 5 can be used to compare the growth effect of a reduction in corruption and an increase in economic freedom. For a country with the EFI at the sample average (EFI = 48.54), a one standard deviation decrease in the incidence of corruption (increase in CPI of 2.43) will cause the growth rate of per capita real GDP to be higher by 1.22 percentage points. On the other hand, for a country with the CPI at the sample mean (CPI = 4.72), a one standard deviation increase in the index of economic freedom (increase in EFI of 9.76) will actually lower the growth rate of real per capita GDP by 0.4 percentage point. This outcome suggests that a focus on anti-corruption policies supplemented by economic liberalization policies is advisable in the developing countries that have very high corruption (CPI close to zero) and very low economic freedom (EFI well below 48.54).

Our findings run counter to some of the findings reported in the literature. For example, Méon and Sekkat (2005) find that the relationship between corruption and the rate of growth is inverse and linear. We find that the relationship is nonlinear: In countries with high economic freedom, an increase in corruption does not decrease economic growth. Méndez and Sepúlveda (2006) find that in countries that are freer, corruption and growth are negatively related. None of these previous works consider economic freedom as an explanatory variable. As mentioned earlier, Méon and Sekkat use a cross-sectional model. We found that if a cross-sectional model is fitted to our data, the coefficient for the CPI is indeed positive, signifying that more corruption (lower CPI) leads to lower growth.⁴ That result is consistent with the previous literature using the same approach. Our contrasting results are due in part to the fact that we have used a more appropriate econometric model. It will be recalled that although Méndez and Sepúlveda use fixed effects estimation, they do not control for the endogeneity of corruption and investment. Thus, the significant difference between our finding and the findings reported in the literature may be due to differences in model specification: Our model both controls for fixed effects and allows for the endogeneity of corruption and investment while the models used by previous authors do not.

Conclusion

There is an extensive literature on the effect of corruption on the rate of growth of per capita income. This literature is based mostly on cross-sectional analyses and ignores the well-recognized fact that

⁴For the sake of brevity, those results are not reported here. They are available from the authors upon request.

growth, corruption, and investment are jointly determined. Also, the role of economic freedom in determining how economic agents adjust to corruption is not addressed explicitly.

This article differs from the previous works in two important ways: First, economic freedom is included explicitly as an explanatory variable. Second, corruption and investment are treated as endogenous variables.

Our econometric results lead us to conclusions that run counter to the generally accepted view in the literature that corruption is harmful to growth. We find that, all else being equal, corruption lowers growth when the economic agents have very few choices (i.e., when economic freedom is low); but, if people face many choices (i.e., if economic freedom is high), corruption helps growth by providing a way around government controls.

These findings have significant public policy implications, especially for developing countries. They suggest that in countries with very high corruption (CPI close to zero) and very low economic freedom (EFI well below 48.54), a focus on anti-corruption policies supplemented by economic liberalization policies is advisable to encourage economic growth. One interesting example that may at first glance appear to contradict our findings is China. China has a higher incidence of corruption relative to other countries (CPI for 2004 = 3.4) and a low economic freedom score, but it also has high economic growth. The key factor is that the incidence of corruption has declined substantially since 1995 (CPI in 1995 was 2.16). While economic freedom in China has also increased modestly in recent years, over the 1995–2004 period we examine, it has actually declined slightly. Thus, what has happened in China actually supports our hypothesis that in a country with low economic freedom, corruption is growth reducing. Therefore, a reduction in corruption would be expected to increase growth, which is what we have seen in China.

Appendix: Definitions of Variables and Summary Statistics

Net Primary Enrollment Ratio. The ratio of the number of children of official school age (as defined by the national education system) who are enrolled in school to the population of the corresponding official school age. Primary education provides children with basic reading, writing, and mathematics skills along with an elementary understanding of such subjects as history, geography, natural science, social science, art, and music.

Net Secondary Enrollment Ratio. The ratio of the number of children of official school age (as defined by the national education system) who

are enrolled in school to the population of the corresponding official school age. Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers.

Total Population. Based on the de facto definition of population, which counts all residents regardless of legal status or citizenship—except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin.

GDP per Capita. Gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2000 U.S. dollars.

Annual Percentage Growth Rate of GDP per Capita. Based on constant local currency. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Gross Domestic Investment (as a Ratio of GDP). Consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress." According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.

Size of Government. General government final consumption expenditure as a share of GDP.

General Government Final Consumption Expenditure. Formerly general government consumption, includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.

TABLE A1
SUMMARY STATISTICS

Variable	Mean	Std. Dev.	Min.	Max.
Corruption (CPI)				
Overall	4.72	2.43	0.4	10
Between		2.19	1.34	9.64
Within		0.39	2.80	6.74
Economic Freedom (EFI)				
Overall	48.54	9.76	17.90	73.96
Between		9.25	23.05	72.59
Within		3.31	30.26	62.97
CPI×EFI				
Overall	255.74	164.37	14.78	666.46
Between		150.50	51.55	642.04
Within		23.13	137.55	358.36
GDP per Capita				
Overall	6,119.43	9,080.99	44.64	46,067.20
Between		9,238.53	99.01	39,568.07
Within		931.12	-726.36	12,882.44
Primary Education				
Overall	85.58	15.70	26.14	100
Between		15.97	31.29	99.97
Within		2.19	75.94	101.37
Secondary Education				
Overall	63.81	25.77	5.26	99.68
Between		25.60	5.65	99.56
Within		2.30	53.04	74.99
Political Stability				
Overall	22.35	29.76	0	194
Between		29.51	0	189
Within		4.13	2.90	47.99
Population Growth				
Overall	0.01	0.02	-0.24	0.15
Between		0.01	-0.01	0.07
Within		0.01	-0.22	0.17
Openness				
Overall	79.26	42.49	1.53	330.60
Between		41.52	2.80	278.72
Within		11.35	28.65	169.61
Government Size				
Overall	15.63	6.02	3.78	40.10
Between		6.13	4.70	40.10
Within		1.95	7.35	29.77

continued

TABLE A1 (continued)
SUMMARY STATISTICS

Variable	Mean	Std. Dev.	Min.	Max.
Investment Rate				
Overall	21.82	6.78	0.21	61.85
Between		5.40	7.64	40.38
Within		4.26	4.57	58.34

NOTES: The overall means and standard deviations are calculated over countries and years; the between standard deviations are calculated over country observations averaged over time; the within standard deviations refer to deviation of observations from respective country average.

References

- Arellano, M., and Bond, S. (1991) "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58: 277–97.
- Baltagi, B. (2001) *Econometric Analysis of Panel Data*. 2nd ed. London: John Wiley.
- Ehrlich, I., and Lui, F. T. (1999) "Bureaucratic Corruption and Endogenous Economic Growth." *Journal of Political Economy* 107: S270–93.
- Dawson, J. W. (2003) "Causality in the Freedom-Growth Relationship." *European Journal of Political Economy* 19 (3): 479–95.
- Ganuzza, J., and Hauk, E. (2001) "Economic Integration and Corruption: The Corrupt Soul of the European Union." Working Paper No. 482, Department of Economics and Business, Universitat Pompeu Fabra (Spain). Available at www.econ.upf.edu/docs/papers/downloads/482.pdf.
- Graeff, P., and Mehlkop, G. (2003) "The Impact of Economic Freedom on Corruption: Different Patterns for Rich and Poor Countries." *European Journal of Political Economy* 19: 605–20.
- Gyimah-Brempong, K. (2002) "Corruption, Economic Growth, and Income Inequality in Africa." *Economics of Governance* 3: 183–209.
- Gyimah-Brempong, K., and de Camacho, S. M. (2006) "Corruption, Growth and Income Distribution: Are There Regional Differences?" *Economics of Governance* 7: 245–69.
- Heckelman, J., and Powell, B. (2007) "Corruption and the Institutional Environment for Growth." Unpublished manuscript.
- Houston, D. (2007) Can Corruption Ever Improve an Economy? *Cato Journal* 27 (3): 325–42.
- Islam, N. (1995) "Growth Empirics: A Panel Data Approach." *Quarterly Journal of Economics* 110 (4): 1127–70.
- Kaufmann, D.; Kraay, A.; and Zoido-Lobaton, P. (1999) "Governance Matters." World Bank Working Paper No. 2196.
- Lambsdorff, J. G. (2004a) "Corruption Perceptions Index 2003." In R. Hodess, T. Inowlocki, D. Rodriguez, and T. Wolfe (eds.) *Global Corruption*

- Report 2004: Transparency International*, 282–87. London: Pluto Press.
- _____. (2004b) “Background Paper to the 2004 Corruptions Perceptions Index: Framework Document 2004.” Transparency International and University of Passau. Available at www.transparency.org/policy_research/surveys_indices/cpi/2004.
- Marshall M. G., and Jagers, K. (2002) *Polity IV Project: Dataset and Users Manual*. College Park, Md.: University of Maryland.
- Mauro, P. (1995) “Corruption and Growth.” *Quarterly Journal of Economics* 110 (3): 681–712.
- Méon, P., and Sekkat, K. (2005) “Does Corruption Grease or Sand the Wheels of Growth?” *Public Choice* 122: 69–97.
- Méndez, F., and Sepúlveda, F. (2006) “Corruption, Growth and Political Regimes: Cross-Country Evidence.” *European Journal of Political Economy* 22: 82–98.
- Mo, P. H. (2001) “Corruption and Economic Growth.” *Journal of Comparative Economics* 29: 66–79.
- Osterfeld, D. (1992) *Prosperity versus Planning: How Government Stifles Economic Growth*. New York: Oxford University Press.
- Pelligrini, L., and Gerlagh, R. (2004) “Corruptions Effect on Growth and Its Transmission Channels.” *Kyklos* 57 (3): 429–56.
- StataCorp. (2003) *Stata Statistical Software: Release 8.0*. College Station, Tex.
- Transparency International (various years) *Corruption Perceptions Index*. Available at www.transparency.org/surveys/index.html#cpi.
- Treisman, D. (2000) “The Causes of Corruption: A Cross-National Study.” *Journal of Public Economics* 76: 399–457.
- World Bank (2004) *World Development Indicators*. Available at www.devdata.worldbank.org.