Business Corruption and Economic Prosperity

Eli Amir[1,2], Shai Danziger[3], and Shai Levi[1]

Abstract

Prior literature shows that government corruption mostly hurts poorer economies, whereas recent events, including the 2008 U.S. economic crisis, suggest that business corruption may harm growth in wealthier economies. Using multinational surveys in which citizens communicated their perceptions of corruption levels in both the private and the public sectors, we examine the extent of business corruption relative to government corruption in countries and its relation to economic prosperity. We find that citizens of wealthier countries report higher business corruption than citizens of poor countries, and relatively low government corruption. Business corruption is evidently a greater concern to citizens of wealthier countries. Furthermore, we find that an increase in perceived business corruption is associated with a decrease in income per capita mainly in wealthy countries. In wealthier economies, business trust has a larger role, and perceived business corruption has a stronger effect on growth. Finally, our evidence suggests that an increase in perceived business corruption leads to increase in regulation, and the marginal effect of the regulation on growth is positive.

Keywords

business corruption, government corruption, economic prosperity, regulation

Introduction

Government corruption mostly hurts poorer economies (e.g., Ades & Di Tella, 1999; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1999; Mauro, 1995; Svensson, 2005; Treisman, 2000). Recent events suggest that business corruption stints growth in wealthier economies. For example, the Financial Crisis Inquiry Commission that investigated the severe 2008 economic crisis in the United States identified the "breakdown in ethics" of businesses as one of the reasons for the crisis (Financial Crisis Inquiry Commission, 2011). Business corruption is also believed to be at the core of Iceland's economic crisis, where the three major privately owned commercial banks collapsed in 2008, and where income

[1]Tel Aviv University, Israel
[2]City, University of London, UK
[3]University of Sydney, Australia

Corresponding Author:
Shai Levi, Coller School of Management, Tel Aviv University, Tel Aviv 69978, Israel.
Email: shailevi@tau.ac.il

per capita shrank by more than 11% from 2007 to 2010 (Boyes, 2009). The Volkswagen emissions scandal (see, for example, U.S. Environment Protection Agency, 2015) is another recent example of the business corruption that takes root in wealthy countries with low government corruption. In this research, we examine the extent of perceived business corruption relative to government corruption in countries and its relation to national economic prosperity. Our analysis is based on surveys administered in more than 80 countries that asked citizens their perceptions of corruption in both the business and government sectors.

Our analysis suggests two major conclusions: First, we find that whereas citizens perceive government corruption to be lower in countries with higher income per capita, as prior literature reports, they perceive business corruption to be higher in wealthier countries. One may expect a positive relation between government and business corruption because legal and cultural standards can influence the behavior of business people and civil servants similarly (e.g., Aghion, Algan, Cahuc, & Shleifer, 2010), and because less corrupt governments can act to reduce business corruption.[1] However, the norms and mechanisms that prevent public officials from seeking private gains may not stop businesspersons from corruptly pursuing profits in wealthy countries. In some cases, the intense competition and markets in prosperous economies may actually drive businesspersons to act unethically (Akerlof & Shiller, 2015; Shleifer, 2004).[2] Citizen perceptions of businessperson corruption in wealthy countries might be biased and may not reflect objective corruption. Even so, these perceptions may affect the economy. Indeed, our second main finding is that perceived business corruption is negatively associated with economic prosperity mostly in wealthier countries.

Corruption perceptions can reduce citizens' willingness to engage in transactions, and thus hurt economic growth.[3] Although direct losses from corruption should be lower in wealthier countries, because their legal systems, enforcement mechanisms, and means of loss recovery are typically better than those of poor countries (e.g., Svensson, 2005), overall economic losses may still be larger in wealthier countries due to the negative effect of business corruption on trust. Trust fosters a commitment to work for cooperative solutions. Because most contracts are incomplete and efficient behavior cannot be completely enforced, voluntary cooperation of economic agents, which is driven by trust, will increase economic growth (e.g., Knack & Keefer, 1997; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997). In wealthy countries, cooperative activities generate large surpluses, which can then be distributed to the participants. For example, financial markets, which are built on trust (e.g., Guiso, Sapienza, & Zingales, 2008), are larger in wealthier countries.[4] Poorer countries, by contrast, tend to have lower wealth generation, and their financial activities are closer to zero-sum games. Therefore, although business corruption will affect wealth distribution in poorer countries, it will likely have a smaller effect on growth.

To measure the effect of perceived business corruption on prosperity, we estimate a system of equations that simultaneously determine income per capita and corruption perceptions. We find that perceptions of business corruption have a negative effect on national income per capita; perceived business corruption is higher in high-income-per-capita countries, and the marginal effect of perceived business corruption on income per capita is negative. By contrast, perceived government corruption is higher in low-income-per-capita countries. The marginal effect of perceived government corruption on income per capita is negative. Both business corruption and government corruption hurt economic growth. Business corruption is a bigger problem in wealthy economies, and government corruption is a bigger problem in poor economies. Our analysis suggests a stronger relation between perceived business corruption and economic growth in wealthier economies. The casual effect
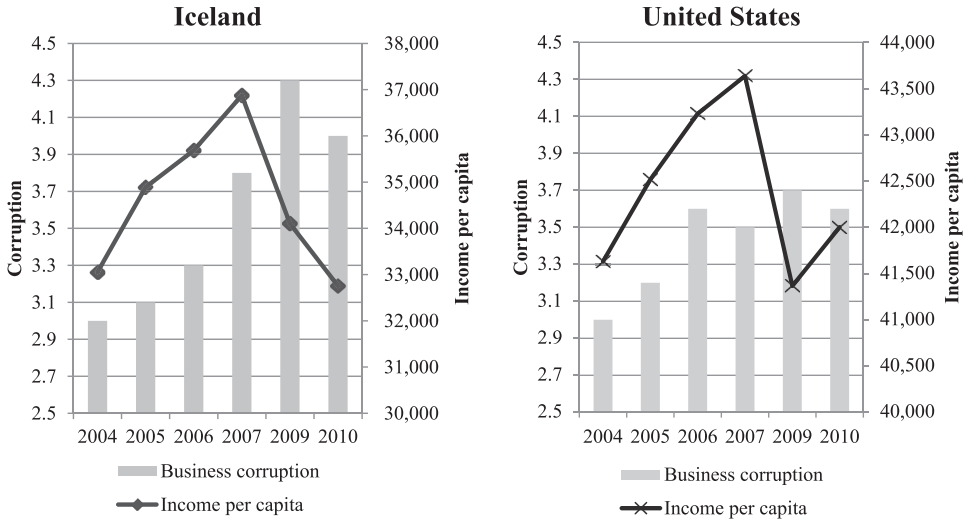
Figure 1. Perceived business corruption in Iceland and the United States around the 2008 financial crisis.

of corruption perceptions on growth is difficult to establish, especially at the macrolevel of countries, and we further use time-series tests (Granger causality) to examine how changes in business-corruption perceptions in countries over time relate to subsequent growth.

The time-series analysis leads to similar conclusions. We find that an increase in citizens' perceptions of business corruption is associated with a decrease in future income per capita. For example, we find that citizens of the United States and Iceland perceived an increase in business corruption in the years preceding the economic crises that started in 2008 (Figure 1). These reports of an increase in business corruption predated the crisis, and therefore were not driven by it. Citizen perceptions can be leading indicators of growth.[5] In our sample period, the main effect of perceived business corruption is evident during the 2008 economic crisis. Perceived corruption will increase perceived risk of transactions and investments, and individuals become more risk averse during recessions (e.g., Campbell & Cochrane, 1999). We indeed find that increases in perceived business corruption before the crisis are associated with growth in 2008. In general, we find that the increase in perceived business corruption is negatively associated with future economic growth only in wealthy counties. In low-income-per-capita countries, we find no significant association between perceived business corruption and growth.

We also examine the effect of business-corruption perceptions conditioned on personal income, and find that only the perceptions of citizens with average or above average incomes are associated with national future income per-capita growth. Low-income citizens are less involved in the economy, and their perceptions of business corruption are less consequential for economic growth.

Finally, we examine the role of regulation in the relation between perceived business corruption and prosperity. Governments may use regulation to restore citizen trust. When citizens perceive business corruption, they may be less willing to engage in transactions and may prompt governments to regulate business more stringently (Aghion et al., 2010). Using regulation of entry, as measured by the number of procedures required to start a new business, we find that higher perceived business corruption leads to more regulation, and regulation positively affects growth. Regulation, however, does not reduce perceived

business corruption. This finding is consistent with research showing that although regulation may decrease corruption, it will not necessarily increase trust (Carlin, Dorobantu, & Viswanathan, 2009).

Corruption Measures

In our analysis, we use the Transparency International (TI) survey on citizens' perceptions of corruption. TI surveys citizens from different countries on their perception of corruption in their own countries' institutions or sectors, such as political parties, parliament, police, judicial system, media, tax authorities, medical services, education, military, utilities, registry and permit services, and nongovernmental organizations. TI first provides participants with a broad definition of corruption that captures forms of both public and private sector corruption: ''the abuse of entrusted power—by a public official or a businessperson, for example—for private gain. This could include material gain or other benefits'' (quote taken from Appendix 1 in the Global Corruption Barometer 2007 report). For instance, managers are corrupt if they misuse company assets or manipulate disclosures to increase their bonuses. The survey then asks participants to rate how corrupt they perceive each institution or sector to be on a 5-point scale, where ''1'' indicates *not at all corrupt* and ''5'' means *extremely corrupt*. TI administered this survey six times between 2004 and 2010, drawing on a large number of individuals from different countries. In 2010, for example, it interviewed more than 91,500 people in 86 countries. The sample in each country was weighted to be nationally representative, and TI conducted the survey in the local languages, face to face, by telephone, or online. The number of sectors included in the questionnaire changes over time. In 2004, for example, the survey asked about the perceived corruption in 15 sectors, and in 2009, about the perceived corruption in six sectors.

The measure we use captures citizens' perceptions not actual corruption. Such opinions may not be based on any direct knowledge and could be biased. Cross-national differences could reflect differences in the socially encouraged level of cynicism, the degree of public identification with the government, and the perceived injustice of social or economic relations. Opinions about the extent of corruption might reflect the frequency of media reports, of government anticorruption campaigns, and so on. However, the evidence suggests that perceptions of corruption correspond to survey participants' actual encounters with corruption. For example, in 2007, TI asked participants who rated the corruption of institutions to also indicate whether these institutions requested bribes from them, and found a strong link between the two. The correlation coefficient between the percentage of respondents who reported paying a bribe to the judiciary, the police, the registry and permit services, utilities, tax authorities, and medical and education services, and the percentage of respondents considering these services as corrupt is .47 ($p < .01$). In general, researchers and organizations use corruption perception measures widely, and their correlation with objective measures is high. Svensson (2005), for example, reports that the correlation between Control of Corruption and the corruption perception index (CPI) is .97, and the correlation between either of these and the corruption scores from the International Country Risk Guide is .75. Prior research has used TI's perception-based corruption measures as an indication of citizens' actual propensity to act corruptly (e.g., Barr & Serra, 2010). Importantly, perceptions also matter directly. If, for example, citizens believe that the courts and police are corrupt, they will not want to use their services regardless of the objective reality. Similarly, if citizens believe that businesses are corrupt, they will be less willing to transact with them.

Table 1. Simple Correlations Between Corruption Measures.

	Business corruption	Police corruption	Parliament corruption	Judiciary corruption	Business distrust	Corruption perception index
Business corruption		.297***	.485***	.396***	.223	−.190***
Police corruption	.281***		.761***	.864***	.203	−.889***
Parliament corruption	.456***	.736***		.840***	.150	−.692***
Judiciary corruption	.402***	.853***	.816***		.255	−.806***
Business distrust	.391**	.307	.254	.353*		−.320*
Corruption perception index	−.226***	−.870***	−.690***	−.803***	−.307	

Note. The table presents Pearson's (above diagonal) and Spearman's (below diagonal) pairwise correlations between corruption measures. *Business, Police, Parliament, and Judiciary corruption* measures are citizen-perceived corruption measures in each of these sectors. Data are taken from Transparency International's Global Corruption Barometer reports between 2004 and 2010. Individuals were asked to rank corruption on a 5-point scale, where "1" is "not at all corrupt" and "5" is "extremely corrupt." *Corruption perception index* is experts' perception of government corruption on a 10-point scale, where "10" indicates "not at all corrupt" and "1" indicates "extremely corrupt." *Business Distrust* is based on the World Values Survey in which citizens were asked, "Do you have a lot of confidence, quite a lot of confidence, not very much confidence, no confidence at all in major companies?" The variable is equal to 1 if the answer is no confidence, and 0 otherwise.

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

As an alternative measure of business corruption, we use data from the World Values Survey (WVS), which asks the survey respondents, "Do you have a lot of confidence, quite a lot of confidence, not very much confidence, no confidence at all in major companies?" Following Aghion et al. (2010), we calculate business distrust as the country average over the four waves of the WVS, 1981-1984, 1990-1993, 1995, and 1999-2003; this variable is equal to 1 if the answer is no confidence, and 0 otherwise.

Table 1 shows the correlation between our main variables of interest: the correlation between perceived corruption in the judiciary system, police, and parliament is high, and the correlation between the perceived corruption in these three sectors and business corruption is lower. The government-corruption perceptions of citizens participating in the TI survey correspond to experts' perceptions. TI produces the CPI by polling experts on their perceptions of government corruption. The correlation between the CPI and citizens' perceptions of the judiciary system, police, and parliament corruption is high (at least −.69). The correlation between the CPI and citizens' perceptions of business corruption is much lower (−.19). The high correlation between experts' and citizens' perceptions of government corruption, coupled with the lower correlation of business corruption with these two measures, suggests that citizens perceive government and business corruption differently.

Results

First, we examine the relation between the change in citizens' perceptions of business corruption and future economic growth. As discussed above, some experts believe that business corruption had a role in the 2008 economic crises in the United States and Iceland (Boyes, 2009; Financial Crisis Inquiry Commission, 2011). Consistent with these claims, TI survey data show that citizens of the United States and Iceland perceived an increase in business corruption in the years preceding the crises (Figure 1).

Performing the analysis for all TI survey data, which extend to more than 80 other countries, we find that an increase in citizens' perceptions of business corruption is generally

associated with a decrease in future income per capita. Specifically, we estimate the relation between change in business corruption and future growth in income per capita:

$$\Delta GDP_{i,t+1} = a + b_1 \Delta BCorruption_{it} + b_2 \Delta GCorruption_{it} + b_3 \Delta GDP_{it} + b_4 W_i$$
$$+ b_5 \Delta BCorruption_{it} \times W_i + b_6 \Delta GCorruption_{it} \times W_i + b_7 \Delta GDP_{it} \times W_i + \varepsilon_{it}. \tag{1}$$

Our measures of business and government corruption, BCorruption and GCorruption, are based on data taken from TI's Global Corruption Barometer reports between 2004 and 2010 (see discussion above). $\Delta BCorruption_{it}$ is the change in business corruption, and $\Delta GCorruption_{it}$ is the change in government corruption from the preceding survey and the survey at year t. The sample includes 268 observations between 2005 and 2010. ΔGDP_{it} is the percentage change from year $t - 1$ to t in the GDP per capita converted to 2005 international dollars using purchasing power parity rates, and $\Delta GDP_{i,t+1}$ is the percentage change from year t to year $t + 1$. W is an indicator variable that equals 1 for countries with high income per capita, or specifically for countries that in 2003 had above-median GDP per capita among the countries in the World Bank data. The model is estimated with year fixed effects, and t-statistics are based on standard errors clustered by country.

As Table 2 shows, the change in business corruption at year t is negatively associated with the growth in countries' income per capita at year $t + 1$. The coefficient on $\Delta BCorruption_{it}$ is $-.015$ and is significant at the .01 level (Model 3). A Granger causality test based on Model 3, which examines the effect of changes in perceived business corruption, $\Delta BCorruption_{it}$, on future growth, $\Delta GDP_{i,t+1}$, yields similar results. For example, the F-test for lag order of 1 is 9.27, and rejects the null of no Granger causality at the .01 level. The change in government corruption, however, does not have a significant effect on future growth, and the coefficient on $\Delta GCorruption_{it}$ does not differ from 0 (Model 4).

Table 2 also tests the different effects of corruption on the growth of poor and wealthy countries. Business trust plays a larger role in wealthy economies, as discussed above, and we predict that an increase in business corruption will have a larger negative effect on the economic growth of wealthy countries. We find that an increase in business corruption is significantly associated only with growth in the income per capita of wealthy countries; the coefficient on $\Delta BCorruption_{it} \times W_i$ is $-.024$ and is significant at the .01 level (Model 5). By contrast, the change in business corruption is not significantly associated with the income-per-capita growth in poor countries, and the coefficient on $\Delta BCorruption_{it}$ is .005 and is statistically insignificant.

As already noted, business corruption can undermine business trust, and business trust plays a larger role in wealthy economies. One arena in which trust may be particularly important is financial markets which are larger in wealthy countries. For example, the market capitalization of listed companies and debt financing is higher in wealthier countries. The Pearson correlation of national income per capita in our sample with the market capitalization, as a percentage of GDP, of companies listed on the country's stock exchanges (data from the World Bank) is .43, and with the domestic credit to the private sector as a percentage of GDP (data from the World Bank) is .72. Trust is important in financial markets because loan and investment agreements rely on future actions of the parties involved, and transactions are by nature interlinked—new transactions are often derived or based on the validity of prior transactions. When we sort sample countries based on a median split of the market capitalization of listed companies as a percentage of GDP, or on a median split of the domestic credit to the private sector as a percentage of GDP,

Table 2. Analysis of Changes in Corruption and Economic Prosperity.

	Model 1 ΔGDP_{it}	Model 2 $\Delta GDP_{i,t+1}$	Model 3 $\Delta GDP_{i,t+1}$	Model 4 $\Delta GDP_{i,t+1}$	Model 5 $\Delta GDP_{i,t+1}$	Model 6 $\Delta GDP_{i,t+1}$
$\Delta BCorruption_{it}$	−.003	−.017	−.015	−.014	.005	.005
	(−0.60)	(−3.42)***	(−3.64)***	(−3.34)***	(0.71)	(0.42)
$\Delta GCorruption_{it}$				−.002		−.002
				(−0.35)		(−0.22)
ΔGDP_{it}			.534	.533	.408	.406
			(7.52)***	(7.44)***	(2.43)**	(2.82)***
$\Delta BCorruption_{it} \times W_i$					−.024	−.023
					(−2.73)***	(−2.75)***
$\Delta GCorruption_{it} \times W_i$						−.005
						(−0.43)
$\Delta GDP_{it} \times W_i$					.169	.167
					(1.04)	(1.04)
No. of observations	268	268	268	268	268	268
R^2 (%)	48.2	10.6	35.4	35.4	39.0	39.2

Note. The table reports results for estimating the relation between change in business corruption and government corruption (right-hand side), and economic prosperity (left-hand side). The model is

$$\Delta GDP_{i,t+1} = a + b_1 \Delta BCorruption_{it} + b_2 \Delta GCorruption_{it} + b_3 \Delta GDP_{it} \\ + b_4 W_i + b_5 \Delta BCorruption_{it} \times W_i + b_6 \Delta GCorruption_{it} \times W_i + b_7 \Delta GDP_{it} \times W_i + \varepsilon_{it}. \quad (1)$$

Business and government corruption measures, *BCorruption* and *GCorruption*, are based on data taken from Transparency International's Global Corruption Barometer reports between 2004 and 2010. Individuals ranked corruption on a 5-point scale, where "1" is "not at all corrupt" and "5" is "extremely corrupt." $\Delta BCorruption_{it}$ is the change in business corruption, and $\Delta GCorruption_{it}$ is the change in government corruption from the preceding survey to the survey at year *t*. ΔGDP_{it} is the percentage change from year $t - 1$ to *t* in the GDP per capita converted to 2005 international dollars using purchasing power parity rates, and $\Delta GDP_{i,t+1}$ is the percentage change from year *t* to year $t + 1$. *W* is an indicator variable that equals 1 for countries with high income per capita, or specifically for countries with above-median GDP per capita in the World Bank data. The regressions are estimated with year fixed effects, and *t*-statistics presented in parentheses are based on standard errors clustered by country. The numbers in parentheses are *t*-statistics.
*, **, and ***denote significance at the 10%, 5%, and 1% levels, respectively.

results (not tabulated) are similar to those reported in Table 2; an increase in business corruption is negatively associated with future changes in income per capita only in countries with high market capitalization of listed companies and high debt financing.

Investments in intellectual propriety are another example of long-term transactions. Wealthy countries have larger expenditures on research and development (R&D) than poor countries—the Pearson correlation between national income per capita and national expenditures on R&D as a percentage of GDP (from the World Bank) is .66. When sample countries are sorted into two groups based on national expenditures on R&D as a percentage of GDP, we find (not tabulated) that an increase in business corruption is negatively associated with future changes in income per capita only in countries with high expenditures on R&D.

Note that the negative effect of perceived business corruption on income per capita in the within-country-changes analysis presented in Table 2 is mainly around the 2008 crisis. The analysis demonstrates that the countries that had an increase in business corruption in the year prior to the crisis experienced the greatest decrease in income per capita during that crisis. We obtain similar results when we estimate the relation between the change in
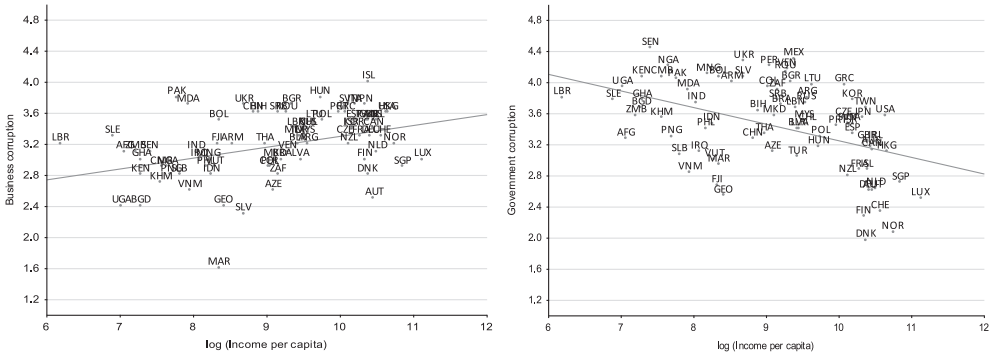
Figure 2. Corruption and economic prosperity.

perceived business corruption and growth in income per capita 2 years ahead, instead of 1 year ahead.

Next, we use structural equations to examine the effect of perceived business corruption on national income per capita. As Figure 2 shows, citizens of wealthy countries perceive business corruption to be higher than do citizens of poor countries. This finding is true in absolute and in relative terms—citizens of wealthier countries perceive businesses as more corrupt and government as less corrupt. Because each survey respondent communicates his or her perceptions of corruption both in the business sector and in government, we can examine relative corruption and control for differences in the behavior standards that citizens of wealthy and citizens of poor countries apply. For example, if survey respondents in poor countries rank the corruption of businesses as 3 on a 5-point scale, and respondents in wealthy economies are more sensitive to corruption and rank the same corruption as 4, we expect that they will be equally sensitive to government corruption. Figure 2 shows that business corruption is perceived to be higher in wealthier countries, whereas government corruption is perceived to be lower; therefore, in relative terms, when dividing business corruption by government corruption, for example, business corruption is higher in wealthier countries. As the U.S. and Icelandic crises demonstrate, business corruption can become endemic in prosperous economies and eventually hurt the economy.

To test the effect of perceived business corruption on economic prosperity and of prosperity on perceived business corruption, we estimate a system of equations that simultaneously determine income per capita and corruption perceptions. We test if business corruption has an effect on income per capita after controlling for effects of human and capital and physical capital (Equation 2a). We also control for regulation. Perceived corruption can motivate countries to impose more stringent regulation, and regulation can affect perceived corruption (e.g., Aghion et al., 2010). We assume that income per capita, corruption, and regulation are endogenously determined, and estimate the following three regressions using three-stage least squares (3SLS):

$$GDP_{it} = a + \beta_1 BCorruption_{it} + \beta_2 Regulation_{it} + \beta_3 Eduaction_i + \beta_4 Capital_i + \varepsilon_{it}.$$

(2a)

$$BCorruption_{it} = a + \beta_1 GDP_{it} + \beta_2 Regulation_{it} + \beta_3 Openness_{i,t-1} + \beta_4 Democracy_i + \varepsilon_{it}.$$

(2b)

$$Regulation_{it} = a + \beta_1 GDP_{it} + \beta_2 BCorruption_{it} + \beta_3 Eduaction_i + \beta_4 Population_{i, t-1} + \varepsilon_{it}.$$
(2c)

GDP is the natural logarithm of GDP per capita converted to 2005 international dollars using purchasing power parity rates. *BCorruption* is the perceived business corruption defined above. *Regulation* is the natural logarithm of the number of procedures that are required to start a new business. The data are taken from the World Bank. Aghion et al. (2010) use a similar measure to show that governments enact this regulation in response to citizen distrust. The exogenous variables include *Capital*, which is the average stock of physical capital per capita between 1980 and 1990 (Nehru & Dhareshwar, 1993) measured in constant 2005 international dollars using purchasing power parity rates.[6] *Education*, which serves as a proxy for human capital, is the natural logarithm of average years of schooling of the population aged above 15 as of 1990; the data are taken from Barro and Lee (2013). Because countries with higher education are also expected to have lower corruption (Svensson, 2005; Treisman, 2007), education is included as an explanatory variable in Equation 2b. *Openness* is a proxy of a country's openness to imports, defined as the imports of goods and services as a percentage of GDP, and taken from the World Bank. *Democracy* is the number of consecutive years since 1930 that the country had been democratic as of 2000; the data are taken from Treisman (2007). Openness to imports and democratic traditions are usually associated with lower corruption (e.g., Svensson, 2005; Treisman, 2007). *Population* is the natural logarithm of the number of people in the country according to the World Bank, and it is used to explain regulation (Equation 2c), following Aghion et al. (2010). Each of the three equations includes year fixed effects. The sample includes 270 observations between 2004 and 2010.

We find that perceptions of business corruption have a negative effect on income per capita (the coefficient on *BCorruption* in column A of Table 3 is -3.186), and perceived business corruption is higher in high-income-per-capita countries (the coefficient on *GDP* in column B is 0.156). Higher perceived business corruption leads to more regulation (the coefficient on *BCorruption* in column C in Table 3 is 0.794), and regulation increases economic prosperity (the coefficient on *Regulation* in column A is 2.342). Regulation, however, does not reduce perceived business corruption (the coefficient on *Regulation* in column B is -0.012 but statistically insignificant). This finding is consistent with research showing that although regulation may decrease corruption, it will not necessarily increase trust (e.g., Carlin et al., 2009).

Table 4 presents the estimation of equation system (2), with perceived government corruption, the *GCorruption* variable defined above, instead of perceived business corruption. In contrast to perceived business corruption, perceived government corruption is higher in low-income-per-capita countries (the coefficient on *GDP* in column B is -0.123). The marginal effect of perceived government corruption on income per capita is negative (the coefficient on *GCorruption* in column A is -1.479).

Taken together, the results in Tables 3 and 4 suggest that both business and government corruption hurt economic growth. Business corruption is a bigger problem in wealthy economies, whereas government corruption is a bigger problem in poor economies. We use both a system of simultaneous equations and a Granger causality time-series test to overcome endogeneity, and demonstrate the effect of perceived business corruption on economic activity. Yet, validity of inference depends on the assumption that the equations and regressions are correctly specified. Next, we provide further robustness tests.

We obtain similar results when we estimate the effect of perceived business corruption on income per capita (Table 3) for each of our sample years separately (untabulated).

Table 3. Income per Capita and Perceived Business Corruption.

	Dependent variables		
	(A) *GDP(t)*	*(B)* *BCorruption(t)*	*(C)* *Regulation(t)*
Independent variables			
GDP(t)		0.156 (5.44)***	−0.171 (−4.63)***
BCorruption(t)	−3.186 (−7.23)***		0.794 (3.95)***
Regulation(t)	2.342 (8.69)***	−0.012 (−0.05)	
Openness(t − 1)		−0.004 (−4.12)***	
Democracy		−0.008 (−3.14)***	
Population(t − 1)			0.046 (3.52)***
Education	0.633 (4.45)***		0.038 (0.36)
Capital	1.159 (16.97)***		
System weighted R^2 (%)	62.2		
Observations	270		

Note. The system of equations estimates the relation between business corruption and income per capita. *BCorruption* is the perceived business corruption (see Table 2). The data are taken from Transparency International's Global Corruption Barometer reports between 2004 and 2010. *Regulation* is the natural logarithm of the number of procedures that are required to start a new business. The data are taken from the World Bank. *Openness* is the imports of goods and services as a percentage of GDP. The data are taken from the World Bank. *Democracy* is the number of consecutive years since 1930 that the country had been democratic as of 2000. *GDP* is measured as the natural logarithm of GDP per capita converted to 2005 international dollars using purchasing power parity rates. *Population* is the natural logarithm of the number of people in the country according to the World Bank. *Education* is the natural logarithm of average years of schooling of the population aged above 15 as of 1990. The data are taken from Barro and Lee (2013). *Capital* is the average stock of physical capital per capita between 1980 and 1990 (Nehru & Dhareshwar, 1993) measured in constant 2005 international dollars using purchasing power parity rates. The three regressions are estimated using three-stage least squares (3SLS), including year fixed effects. The *t*-statistics are provided in parentheses.
*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Estimating equation system (2) for 2004, 2005, 2006, 2007, 2009, and 2010, we find that in each of these years, the perceived business corruption negatively affects income per capita (the coefficient on *BCorruption* in Equation 2a is negative and significant each year). In the within-country-changes analysis (Table 2), the negative effect of perceived business corruption on income per capita is mainly around the 2008 crisis, whereas this year-by-year analysis demonstrates that the effect of perceived business corruption on the cross-national variation of income per capita exists every year of the sample.

The results are robust in different specifications. Results are similar when, instead of the level of income per capita, we use growth in income per capita as a measure of economic prosperity. As Table 5 shows, citizens' perceptions of business corruption have a negative effect on growth in income per capita (the coefficient on *BCorruption* in column A is −0.032).

Table 4. Income per Capita and Perceived Government Corruption.

	Dependent variables		
	(A) GDP(t)	(B) GCorruption(t)	(C) Regulation(t)
Independent variables			
GDP(t)		−0.123 (−2.58)***	0.049 (0.70)
GCorruption(t)	−1.479 (−10.29)***		0.582 (4.29)***
Regulation(t)	1.822 (9.95)***	0.436 (1.52)	
Openness(t − 1)		−0.003 (−2.49)**	
Democracy		−0.011 (−3.28)***	
Population(t − 1)			0.045 (3.21)***
Education	0.505 (6.40)***		0.098 (1.33)
Capital	0.553 (10.54)***		
System weighted R^2 (%)	73.6		
Observations	270		

Note. The system of equations estimates the relation between government corruption and income per capita. *GCorruption* is the average of perceived parliament and judiciary corruptions on a 5-point scale. Data are taken from Transparency International's Global Corruption Barometer reports between 2004 and 2010. All other variables are as defined in Table 3. The three regressions are estimated using three-stage least squares (3SLS), including year fixed effects. The numbers in parentheses are *t*-statistics.
*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Results are also similar when, instead of TI's perceived-business-corruption measure, we use the WVS measure of trust in companies, which asked citizens, ''Do you have a lot of confidence, quite a lot of confidence, not very much confidence, no confidence at all in major companies?'' Following Aghion et al. (2010), we calculate business distrust as the country average over the four waves of the WVS, 1981-1984, 1990-1993, 1995, and 1999-2003, a variable that is equal to 1 if the answer is no confidence, and 0 otherwise. Merging the business distrust variable from Aghion et al. (2010) with our sample for the year 2004, we obtain a sample of 28 countries. Estimating equation system (2) with business distrust as a measure of business corruption, we find that it has a negative effect on national income per capita—the coefficient on *Business distrust* in column A of Table 6 is −7.336, significant at the .10 level. The lower number of observations in this sample may explain the low statistical significance relative to the results presented in Table 3.

Furthermore, results are the same when, instead of the number of procedures required to start up a new business, we use the number of days required to open a new business (Djankov, La, Porta, Lopez-de-Silanes, & Shleifer, 2002) as a measure of regulation of entry (Table 7).

Finally, we examine the effect of citizens' business-corruption perceptions conditioned on personal income. We find that only the perceptions of citizens with average or above average incomes are associated with future income-per-capita growth. Low-income citizens are less

Table 5. Income per Capita and Perceived Business Corruption.

	Dependent variables		
	(A) $\Delta GDP(t)$	*(B)* *BCorruption(t)*	*(C)* *Regulation(t)*
Independent variables			
$\Delta GDP(t)$		−3.397 (−0.78)	54.586 (2.59)**
BCorruption(t)	−0.032 (−2.03)**		1.810 (2.33)**
Regulation(t)	0.024 (2.40)**	0.119 (0.46)	
Openness(t − 1)		−0.004 (−3.80)***	
Democracy		−0.004 (−1.44)	
Population(t − 1)			−0.115 (−1.24)
Education	−0.001 (−0.11)		−0.261 (−0.78)
Physical	−0.005 (−2.11)**		
GDP(t − 1)		0.074 (1.94)*	0.277 (1.80)*
System weighted R^2 (%)	41.5		
Observations	270		

Note. The system of equations estimates the relation between business corruption and growth in income per capita. *BCorruption* is the perceived business corruption on a 5-point scale, where "1" is "not at all corrupt" and "5" is "extremely corrupt." The data are taken from Transparency International's Global Corruption Barometer reports between 2004 and 2010. *Regulation* is the natural logarithm of the number of procedures that are required to start a new business. The data are taken from the World Bank. *Openness* is the imports of goods and services as a percentage of GDP. The data are taken from the World Bank. *Democracy* is the number of consecutive years since 1930 that the country had been democratic as of 2000. *ΔGDP* is the percentage growth in income per capita from year $t − 1$ to year t, where income per capita is measured as the natural logarithm of GDP per capita converted to 2005 international dollars using purchasing power parity rates. *Population* is the natural logarithm of the number of people in the country according to the World Bank. *Education* is the natural logarithm of average years of schooling of the population aged above 15 as of 1990. The data are taken from Barro and Lee (2013). *Capital* is the average stock of physical capital per capita between 1980 and 1990 (Nehru & Dhareshwar, 1993) measured in constant 2005 international dollars using purchasing power parity rates. The three regressions are estimated using three-stage least squares (3SLS), including year fixed effects. The numbers in parentheses are *t*-statistics.
*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

involved in the economy, and their perceptions of business corruption are apparently inconsequential for economic growth. Specifically, Table 8 estimates the effect of change in perceived business corruption on future growth in income per capita, using Equation 1, for low- and high-income citizens. We construct the business-corruption perceptions of citizens with low and high income in each country using TI's individual-level survey data. In 2004, 2009, and 2010, where the income data in the survey are in quintiles, we define citizens in the bottom income quintile as low-income citizens and citizens in the top four quintiles as high-income citizens. In the years 2005, 2006, and 2007, where the income demographic data in the survey are reported for three levels of income, we define citizens in the bottom third as

Table 6. Income per Capita and Business Distrust in Companies.

	Dependent variables		
	(A) *GDP(t)*	*(B)* *Business distrust(t)*	*(C)* *Regulation(t)*
Independent variables			
GDP(t)		0.033 (1.42)	–0.172 (–0.99)
Business distrust(t)	–7.336 (–1.77)*		5.603 (2.15)**
Regulation(t)	0.956 (1.60)	0.061 (0.34)	
Openness(t − 1)		–0.001 (–0.47)	
Democracy		–0.001 (–0.55)	
Population(t − 1)			0.021 (0.35)
Education	0.713 (2.19)**		–0.002 (–0.01)
Capital	0.866 (6.11)***		
System weighted R^2 (%)	79.3		
Observations	28		

Note. The system of equations estimates the relation between business distrust and income per capital. *Business Distrust* is based on World Values Survey that asked citizens, "Do you have a lot of confidence, quite a lot of confidence, not very much confidence, no confidence at all in major companies?" Following Aghion, Algan, Cahuc, and Shleifer (2010), we calculate business distrust as the country average over the four waves of the WVS, 1981-1984, 1990-1993, 1995, and 1999-2003; the variable is equal to 1 if the answer is no confidence, and 0 otherwise. All other variables are as defined in Table 3. The three regressions are estimated using three-stage least squares (3SLS), including year fixed effects. The numbers in parentheses are *t*-statistics.
*, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

low-income citizens and citizens in the top two thirds as high-income citizens. We calculate the average perceived business corruption for low- and high-income citizens in each country, and use the change in the average score of low-income citizens and of the high-income citizens between adjacent survey years in the estimation. We find that only the change in average and high-income citizens' perceptions of business corruption is associated with future growth in national income (the coefficient on $\Delta BCorruption$ in column B of Table 8 is −0.018, and in column A, it is not statistically different from 0).

Conclusion

Business trust plays a larger role in the economy of wealthy countries, and we find that an increase in citizens' perceptions of business corruption affects economic growth mostly in wealthy countries. Whereas prior research shows that government corruption mostly hurts poorer countries, we find that business corruption is a greater concern in wealthier economies.

Our analysis shows that citizens report higher business corruption in high-income-per-capita countries than in low-income-per-capita countries. In view of the prior literature showing higher government corruption in poor countries, the idea of higher business

Table 7. Income per Capita and Perceived Business Corruption, Estimated With an Alternative Regulation Measure.

	Dependent variables		
	(A) *GDP(t)*	*(B)* *BCorruption(t)*	*(C)* *Regulation # of days(t)*
Independent variables			
GDP(t)		0.104 (2.69)***	−0.271 (−3.51)***
BCorruption(t)	−6.052 (−5.41)***		1.311 (3.14)***
Regulation # of days(t)	3.006 (5.64)***	−0.213 (−0.86)	
Openness(t − 1)		−0.005 (−3.52)***	
Democracy		−0.009 (−2.71)***	
Population(t − 1)			0.073 (3.56)***
Education	1.579 (5.46)***		−0.233 (−1.01)
Capital	1.531 (8.66)***		
System weighted R^2 (%)	37.2		
Observations	270		

Note. The system of equations estimates the relation between business corruption and economic prosperity, measured as income per capita. *Regulation # of days* is the natural logarithm of the number of calendar days needed to complete the procedures to legally operate a business. The data are taken from the World Bank. All other variables are as defined in Table 3. The three regressions are estimated using three-stage least squares (3SLS), including year fixed effects. The numbers in parentheses are *t*-statistics.
*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

corruption in wealthy countries may seem counterintuitive. However, the norms and mechanisms that prevent public officials from seeking private gains may not stop businesspersons from corruptly pursuing profits in wealthy countries. In some cases, the intense competition and markets in prosperous economies may actually drive businesspersons to act unethically (Akerlof & Shiller, 2015; Shleifer, 2004).

How can wealthy countries keep business corruption from hurting their economies? According to some experts, better regulation could have prevented the U.S. and Icelandic crises or mitigated their effects (Boyes, 2009; Financial Crisis Inquiry Commission, 2011). We find that governments regulate the entry of businesses into their markets when citizens perceive businesses to be corrupt, and this regulation positively affects economic growth on average. These limited results may support the idea that regulation benefits the economy. But the relation between regulation and prosperity is intricate. Regulation can serve the public's interest, or it can benefit bureaucrats and politicians (Djankov et al., 2002; Pinotti, 2012). Even with the best of intentions, whether regulation will help an economy is unclear. Thus, for example, the U.S. Congress enacted the Sarbanes–Oxley Act of 2002 in response to corporate scandals, with the goal of restoring public trust in capital markets. However, the costs of complying with this regulation may have slowed down the U.S.

Table 8. Business Corruption Perceptions of Low- and High-Income Citizens.

	(A) Low-income citizens Dependent variable $\Delta GDP_{i,t+1}$	(B) High-income citizens Dependent variable $\Delta GDP_{i,t+1}$
$\Delta BCorruption_{it}$	−.003	−.018
	(−0.67)	(−3.53)***
ΔGDP_{it}	.537	.536
	(7.05)***	(7.07)***
No. of observations	234	234
R^2 (%)	32.4	35.0

Note. The table reports results for estimating the relation between business corruption on the right-hand side and economic prosperity on the left-hand side for low-income and high-income citizens. Using the individual-level survey data, we construct the business-corruption perceptions of citizens with low and high income in each country. In 2004, 2009, and 2010, the income demographic data are in quintiles, the low income being the bottom income quintile and the high income being the four top quintiles. In years 2005, 2006, and 2007, low reflects the bottom third of income, and high reflects the top two thirds of income. The model is,

$$\Delta GDP_{i,t+1} = a + b_1 \Delta BCorruption_{it} + b_1 \Delta GDP_{it\wedge}.$$

Business-corruption measures are based on data taken from Transparency International's Global Corruption Barometer reports between 2004 and 2010. Individuals ranked corruption on a 5-point scale, where "1" is "not at all corrupt" and "5" is "extremely corrupt." $\Delta BCorruption_{it}$ is the change in business corruption from the preceding survey and the survey at year t. ΔGDP_{it} is the percentage change from year $t-1$ to t in the GDP per capita converted to 2005 international dollars using purchasing power parity rates, and $\Delta GDP_{i,t+1}$ is the percentage change from year t to year $t+1$.

The regressions are estimated with year fixed effects, and *t*-statistics presented in parentheses are based on standard errors clustered by country. The numbers in parentheses are *t*-statistics.

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

economy.[7] We show that business corruption hurts growth in wealthy economies. The question is what measures can remedy this problem.

Acknowledgment

Declaration of Conflicting Interests

Funding

Notes

1. For a discussion of how countries' social norms affect the corrupt behavior of individuals, see, for example, Barr and Serra (2010).
2. For examples of business corruption in prosperous countries, see Stolowy, Messner, Jeanjean, and Baker (2014).
3. In this context, the literature provides evidence that public trust is positively associated with economic growth (e.g., Knack & Keefer, 1997; La, Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997).
4. Efficient behavior cannot be enforced in capital markets either, and trust plays an important role. See Dontoh, Ronen, and Sarath (2013) for an example of the inability of current legal mechanisms in the United States to stop management from misreporting financial statements and distorting efficient capital allocations. Guiso, Sapienza, and Zingales (2008) show that if investors perceive an increase in corruption, they will be less willing to participate in financial markets. Transactions in financial markets are often interlinked and draw validity from the integrity of related transactions. The U.S. mortgage market before the 2008 crisis is an example:

   > Each step in the mortgage securitization pipeline depended on the next step to keep demand going. From the speculators who flipped houses to the mortgage brokers who scouted the loans, to the lenders who issued the mortgages, to the financial firms that created the mortgage-backed securities, collateralized debt obligations (CDOs), CDOs squared, and synthetic CDOs . . . When borrowers stopped making mortgage payments, the losses—amplified by derivatives—rushed through the pipeline. (Financial Crisis Inquiry Commission, 2011)

5. For example, consumer confidence is a leading indicator of economic growth (e.g., Carroll, Fuhrer, & Wilcox, 1994).
6. Because corruption may affect capital investments, we measure physical capital using data from a decade prior to the measure of corruption.
7. Sarbanes–Oxley Act of 2002 opponents claim it ''managed to kill the creation of new public companies in the U.S., cripple the venture capital business, and damage entrepreneurship'' (Editorial, December 21, 2008, *Wall Street Journal*).

References

Ades, A., & Di Tella, R. (1999). Rents, competition, and corruption. *American Economic Review*, *89*, 982-993.

Aghion, P., Algan, Y., Cahuc, P., & Shleifer, A. (2010). Regulation and distrust. *The Quarterly Journal of Economics*, *125*, 1015-1049.

Akerlof, G., & Shiller, R. (2015). *Phishing for phools*. Princeton, NJ: Princeton University Press.

Barr, A., & Serra, D. (2010). Corruption and culture: An experimental analysis. *Journal of Public Economics*, *94*, 862-869.

Barro, R. J., & Lee, J. W. (2013). A new data set of educational attainment in the world, 1950-2010. *Journal of Development Economics*, *104*, 184-198.

Boyes, R. (2009). *Meltdown Iceland: Lessons on the world financial crisis from a small bankrupt Island*. New York, NY: Bloomsbury.

Campbell, J., & Cochrane, J. (1999). By force of habit: A consumption based explanation of aggregate stock market behavior. *Journal of Political Economy*, *107*, 205-251.

Carlin, B., Dorobantu, F., & Viswanathan, S. (2009). Public trust, the law, and financial investment. *Journal of Financial Economics*, *92*, 321-341.

Carroll, C., Fuhrer, J., & Wilcox, D. (1994). Does consumer sentiment forecast household spending? If so, why? *The American Economic Review*, *84*, 1397-1408.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The regulation of entry. *Quarterly Journal of Economics*, *117*, 1-37.

Dontoh, A., Ronen, J., & Sarath, B. (2013). Financial statements insurance. *Abacus*, *49*, 269-307.

Financial Crisis Inquiry Commission. (2011). *Financial Crisis Inquiry Report*. Washington, DC: U.S. Government Printing Office.

Guiso, L., Sapienza, P., & Zingales, L. (2008). Trusting the stock market. *Journal of Finance*, *63*, 2557-2600.

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics*, *112*, 1251-1288.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1997). Trust in large organizations. *American Economic Review*, *87*, 333-338.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1999). The quality of government. *Journal of Law, Economics, & Organization*, *15*, 222-279.

Mauro, P. (1995). Corruption and growth. *Quarterly Journal of Economics*, *110*, 681-712.

Nehru, V., & Dhareshwar, A. (1993). A new database on physical capital stock: Sources, methodology and results. *Revista de Análisis Económico*, *8*, 37-59.

Pinotti, P. (2012). Trust, regulation, and market failures. *The Review of Economics and Statistics, August*, *94*, 650-658.

Shinkman, S. (2015, November 2). *Notice of violation to Volkswagen AG*. Washington, DC: U.S. Environment Protection Agency.

Shleifer, A. (2004). Does competition destroy ethical behavior? *American Economic Review*, *94*, 414-418.

Stolowy, H., Messner, M., Jeanjean, T., & Baker, R. (2014). The construction of a trustworthy investment opportunity: Insights from the Madoff fraud. *Contemporary Accounting Research*, *31*, 354-397.

Svensson, J. (2005). Eight questions about corruption. *The Journal of Economic Perspectives*, *19*, 19-42.

Transparency International. (2004). *Global corruption reports, 05, 06, 07, 09, 10*. Berlin, Germany: Author.

Treisman, D. (2000). The causes of corruption: A cross-national study. *Journal of Public Economics*, *76*, 399-458.

Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research? *Annual Review of Political Science*, *10*, 211-244.