Bad Corruption, Good Corruption and Growth

Maxim Mironov*
Graduate School of Business
University of Chicago
5807 S. Woodlawn
Chicago IL 60637
mmironov@gsb.uchicago.edu
http://home.uchicago.edu/~mmirono1

November 14, 2005

Abstract

This paper analyzes the effect of corruption on economic growth in 141 countries from 1996 to 2004. In accordance with previous research, I find that bad corruption, or corruption which is associated with poor institutions, has a negative effect on GDP growth. However, residual corruption, or corruption which is uncorrelated with other governance characteristics is positively related to GDP growth in countries with poor institutions. An analysis of financial data from more than 9000 companies in 51 countries delivers similar results: residual corruption is positively correlated with capital accumulation and productivity growth in developing countries. These empirical findings are consistent with the theory that corruption helps in overcoming inefficient barriers.

1 Introduction

Corruption has been widely studied and its effect on numerous areas of public and private life are well documented. Most studies agree that corruption is bad. For example Murphy, Shleifer and Vishny (1993) show that corruption leads to a misallocation of talents which is very costly for economy, Shleifer and Vishny (1993) argue that when the entry of government agencies into regulation activity is free, corruption leads to so much bribing that it drives private agents out of a market, and Guriev (2004) shows that corruption "still results in excessive red tape, even after the bureaucrat reduces red

*I am grateful to Gary Becker, Marianne Bertrand, Sergey Guriev, Erez Yoeli, Luigi Zingales and especially to Atif Mian for helpful comments and suggestions.

tape in exchange for bribes". However, it has occasionally been acknowledged that not all forms of corruption are the same, and that some corruption might actually be good (see, for example, Leff, Huntigton, and Lui).

This paper uses cross-country data to examine situations in which corruption may in fact be beneficial. To do so, this paper separates corruption into two parts: bad corruption, or corruption which is related to poor institutions, and residual corruption, or corruption which is uncorrelated with other governance characteristics. In accordance with previous research, I find that bad corruption negatively affects economic development. However, I find that residual corruption is positively correlated with GDP growth, capital accumulation and productivity growth in countries with poor institutions. My findings suggest one important dimension of corruption which has not yet been documented: that corruption may help overcome the harmful effects of bad corruption associated with poor institutions.

Let us first define corruption as *use of public office for private gains.*[1] Using this definition, it is not clear that corruption is bad for a country's overall welfare. For example, Leff (1964) and Huntington (1968) suggest that under rigid regulation and inefficient bureaucracy, corruption might foster economic growth. In their model, agents use "speed money" to get around bad laws and institutions. Additionally, Lui (1985) shows that bribery can be efficient in a queuing model if agents with higher values of time can use bribes to obtain a better place in line.

The intuition behind these results is clear. In the absence of externalities, cumbersome regulations merely place property rights in the hands of regulators and Coasian bargaining should lead to efficient outcomes. For example, in order to open jewelry store in Novosibirsk (Russia) in 1999, one must satisfy all police and fire safety requirements. The police require that all windows be covered with a steel net. However, since a jewelry store is a public place, the fire department requires that windows serve as easy emergency exits. Practically speaking, it is virtually impossible to satisfy both these regulations. Fortunately for jewelers–and Police and Firemen–these regulations can be overlooked with the help of few bribes. If the jeweler internalizes the costs of burglary or the death of her clients in a fire, nothing is lost. Of course, this Coasean bargaining process does not take externalities into account. Thus, corruption often leads to negative social costs. Examples of this might include: issuing passports to criminals, giving drivers licenses to people who do not know how to drive, and giving permission for socially harmful projects. Therefore, corruption might improve efficiency only in the case when the private costs associated with regulation outweigh the social benefits.

[1] This distances the researcher from moral issues related to corruption, which has also been called the "lack of integrity or honesty", "the practice of unlawful or improper use of influence, power, and other means", "dishonest or partial behavior on the part of a government official or employee", and so on.

The empirical research on corruption, investment, and growth was initiated by Mauro (1995). Using a sample of 68 countries, he provides evidence that corruption negatively impacts growth. Shleifer and Wei (2000) find negative relation of corruption and foreign direct investment (FDI). However, Egger and Winner (2005) state that for a sample of 73 countries and time period 1995-1999, they find a clear positive relation between corruption and FDI. A more thorough survey of literature can be found in Bardhan (1997). This paper builds on the previous literature by separating corruption from other government characteristics, such as government effectiveness, regulatory quality, and rule of law. This distinction is important because the quality of institutions and corruption are highly correlated, and this might lead researchers to mistakenly attribute a negative effect of poor institutions on growth or investment to corruption. Using a sample of 141 countries, I find that bad corruption negatively affects economic development. This is consistent with previous findings. However, residual corruption is positively related to GDP growth in countries with poor institutions. Analysis of 9714 companies from 51 countries provides similar results: residual corruption is positively correlated with capital accumulation and productivity growth in countries with poor institutions but has a negative impact on productivity growth in countries with good institutions.

There are several potential explanations for this empirical fact. One is that corruption helps to 'grease the wheels' in a country with poor institutions, allowing individuals to overcome burdensome red tape. Another, suggested by Guriev (2004), is that even though corruption reduces red tape, officials who expect bribes tend to set ex-ante levels of red tape above the socially optimal level. Therefore, one might find positive effect of corruption controlling for institution quality, even if the total effect of corruption on economic development is negative. Yet another possible explanation is that economic growth might feed corruption by providing additional demand for bureaucrat services. My empirical results are consistent with all these explanations and I cannot distinguish between these hypotheses using these data.

The paper proceeds as follows: Section 1 contains a brief theoretical model to motivate the study, Section 2 describes data and the construction of relevant variables, Section 3 describes the empirical results and Section 4 concludes.

2 Model

The model presented in this section is designed as a tool to help explain the empirical results, as well as to explain why almost all previous empirical studies have found a negative impact of corruption on growth and investment. In the model, there are two agents, the bureaucrat and the investor. The

investor wishes to undertake a project with NPV equal to K. To do so, the project should satisfy all government regulation requirements. The cost of satisfying each regulation is C. The economy has two types of regulation: good and bad. The purpose of good regulation is to protect society from the realization of projects with negative externalities. Therefore, the violation of good regulations leads to social costs of $D > C$. Bad regulations can be thought of as excessive red tape and violations of bad externalities have no social cost. Let N_G be the number of good regulations and N_B be the number of bad regulations. For simplicity, let the number of good regulations be the same for each country, but allow the number of bad regulations to vary across countries.

Under these assumptions, the investor's benefits from the project are,

$$K - C\left(N_G + N_B\right)$$

The bureaucrat can reduce regulatory requirements for the investor by γ percent. However, this is illegal, and if the government catches him, his non-monetary costs are F, where F can be thought of as a severance of punishment. F does not depend on the type of regulation which was violated, so the Bureaucrat is indifferent between relaxing good and bad regulations. Let the probability of being caught be $p(\gamma)$, where $p'(\gamma) > 0$, $p''(\gamma) > 0$, $p(0) = 0$, and $p'(0) = 0$. If the bureaucrat relaxes good regulations, social costs for economy equate to $\gamma D N_G$. The investor and the bureaucrat negotiate over γ, sharing the resulting surplus according to Nash bargaining. The joint utility of the investor and the bureaucrat is,

$$U = K - C\left(1-\gamma\right)\left(N_G + N_B\right) - Fp\left(\gamma\right)\left(N_G + N_B\right) \rightarrow \max_{\gamma}$$

The first order condition is,

$$\frac{C}{F} = p'\left(\gamma^*\right) \tag{1}$$

and the bribe in equilibrium equates to,

$$B^* = \frac{\left(C\gamma^* + Fp\left(\gamma^*\right)\right)\left(N_G + N_B\right)}{2}$$

This equation explains the positive relation between corruption index and poor regulation: the greater N_B,the greater B^*, bribe collections in equilibrium, holding the anticorruption policy F fixed. The model suggests that the negative relation between corruption and GDP growth documented in previous empirical studies might be due to the negative relation between poor institutions and GDP growth. For more on this, see proposition 1 below.

Continuing with the analysis, social welfare in equilibrium is

$$SW = K - C\left(1-\gamma^*\right)\left(N_G + N_B\right) - Fp\left(\gamma^*\right)\left(N_G + N_B\right) - \gamma^* N_G D \tag{2}$$

Thus, the main problem for the country at large is that the investor and the bureaucrat do not take the social costs of corruption into account while bargaining.

Proposition 1

$\frac{\partial SW}{\partial F}$ decreases in N_B. If we do not observe F but do observe γ^*–which is the level of corruption– $\frac{\partial SW}{\partial \gamma^*}$ increases in N_B.

Proof.

See Appendix D.

This proposition suggests that if $\frac{\partial SW}{\partial \gamma^*} > 0$ then the positive effect of corruption is stronger in those countries where N_B is high. If $\frac{\partial SW}{\partial \gamma^*} < 0$ (corruption has negative effect), then the higher N_B, the smaller the negative effect of corruption.

Now we can analyze how the optimal level of punishment F^* depends on number of bad laws N_b.

Proposition 2

If $N_B \leq N_G\left(\frac{D}{C}-1\right)$ then $F^* = \infty$ and $\gamma^* = 0$. If $N_G\left(\frac{D}{C}-1\right) < N_B$ then $F^* = 0$ and $\gamma^* = 1$.

Proof.

See Appendix D.

From Proposition 2 it follows, that corruption has a negative effect in countries with efficient regulation (low N_B) and a positive effect in countries with cumbersome regulation (high N_B). Moreover, this positive effect is stronger in countries with more rigid regulations.

The model can be generalized by taking into account the efficiency of government spending and the level of rule of law. If the government uses budget funds efficiently, finances public goods, and corrects market failures, then tax evasion and the corruption associated with it will have a negative impact on development. However, if state officials spend budget money supporting inefficient sectors of economy or waste funds in other ways (e.g. financing projects which can be performed by private sector) then tax evasion *improves* social welfare since the government gets less money to waste. Therefore, under low government effectiveness, corruption in tax collection leaves more money in the private sector of the economy and stimulates development. Similar predictions might be made regarding rule of law: in countries with poor contract enforceability, property rights, and a poor judiciary system, corruption is akin to building quasi-institutions.

Summarizing, the model predicts that if we decompose corruption into two parts: bad corruption, which is correlated with poor institutions, and residual corruption which captures variation in anti-corruption policies, then bad corruption always has negative effect on development whereas residual corruption has negative effect in countries with good regulation and positive effect in countries with poor regulation.

3 Data and Construction of Variables

The corruption index used in this paper–as well as other governance indices–are taken from Kaufmann et al. (2005). These indices represent an aggregation of 37 different data sources constructed by 31 different organizations. Governance indicators include i) Voice and Accountability; ii) Political Instability and Violence; iii) Government Effectiveness; iv) Regulatory Quality; v) Rule of Law, and, vi) Control of Corruption. Kaufmann et al. present their measure for 5 periods 1996, 1998, 2000, 2002 and 2004. Therefore, changes in these characteristics can be tracked during this period. To make it easier to interpret results, I change the sign of the corruption index: $Corruption = -Control\_of\_Corruption$, so that high values of the corruption index represent highly corrupt countries. I get data for GDP per capita for 1993-2003 from Country Watch and for 1980-2002 from the World Bank. Companies' financial data are taken form WorldScope. To check robustness of results, I use Mauro (1995) corruption data.

As a proxy for institution quality, I use Government Effectiveness, Regulatory Quality, and Rule of Law indicators. Government Effectiveness measures the following: quality of bureaucracy, red tape, budget management, government service effectiveness, etc. Regulatory Quality reflects presence of import-export barriers, how easy it is to start a new business, price control, excessive protection, efficiency of anti-monopoly regulation, legal restriction on ownership of business by non-residents, efficiency of tax collection system, etc. Rule of Law represents an aggregation of following concepts: property rights, fairness of the judicial system, crime level, enforceability of contracts, confiscation / expropriation, etc. Control of Corruption measures the use of public office for private gain: the frequency at which firms make extra payments connected to import/export permits, public utilities, tax payments, influencing laws, getting favorable judicial decisions; the quality of anti-corruption policies, the percentage of annual sales which firms pay as unofficial payments to public officials, etc. A full description of variable construction can be found in Kaufmann et al. (2005).

As was mentioned in Introduction, all governance indicators are highly correlated, e.g. correlation between Control of Corruption and Rule of Law in 2004 is .95, and between Control of Corruption and Government Effectiveness is .96. Therefore, it is difficult to distinguish these causally. In order to resolve this problem, I separate corruption into two parts: *systematic corruption* (or *bad corruption)* and *residual corruption (or idiosyncratic corruption).* Systematic corruption is the part of the corruption index which is correlated with other governance characteristics and represents poor judiciary system, low government effectiveness, and cumbersome regulation. As it was shown in the previous section, the lower the quality of regulation, the higher the corruption level *given* the same anti-corruption

policy. Residual corruption is uncorrelated with other institutions and might be related, for example, to quality and effectiveness of anti-corruption policies.

$$Corruption = E(Corruption|G\_E, R\_Q, R\_L) + Idiosyncratic\_Corruption$$

$$Systematic\_Corruption = E(Corruption|G\_E, R\_Q, R\_L)$$

where G_E, R_Q, R_L represent Government Effectiveness (GE), Regulatory Quality (RQ) and Rule of Law (RL). Systematic Corruption is defined as the forecasted values from the OLS regression:

$$Corruption = \alpha + \beta_1 G\_E + \beta_2 R\_Q + \beta_3 R\_L + \varepsilon$$

$$Systematic\_Corruption = \widehat{\alpha} + \widehat{\beta}_1 G\_E + \widehat{\beta}_2 R\_Q + \widehat{\beta}_3 R\_L$$

$$Idiosyncratic\_Corruption = \widehat{\varepsilon}$$

In order to ease comparison of the coefficients, I standardize both systematic corruption and idiosyncratic corruption to unit variance. All these variables are presented in Table 1 for 2004. Data for other years can be provided upon request. In 2004, the top 10 countries with the highest level of idiosyncratic corruption are, in descending order, South Korea, Tuvalu, Marshall Islands, Malaysia, Thailand, Jamaica, Equatorial Guinea, Mauritius, China and Brunei. The ten countries with the lowest level of idiosyncratic corruption are, in ascending order, Liberia, Somalia, Bhutan, Suriname, Guinea-Bissau, Finland, Singapore, Germany, New Zealand and Nicaragua.

I transform Mauro's (1995) data in a similar fashion. Since he uses different characteristics of governance quality (Efficiency of Judiciary System, Red Tape and Corruption), the variables change slightly:

$$Corruption = E(Corruption|E\_J\_S, R\_T) + Idiosyncratic\_Corruption$$

$$Systematic\_Corruption = E(Corruption|E\_J\_S, R\_T)$$

where E_J_S, R_T stand for Efficiency of Judiciary System and Red Tape. I do not present data for Mauro sample, however one can easily obtain these by running OLS regression Corruption on Efficiency of Judiciary System and Red Tape.

Since all these measures are very noisy, especially for small countries, I exclude tiny countries with populations of less than half a million people. Additionally, descriptive characteristics of companies (sales and assets growth per employee) are presented in Table 2.

4 Empirical Results

4.1 Cross Countries.

There is a positive relationship between average idiosyncratic corruption (IC) and GDP growth in the period 1996-2004. This can be seen in Appendix B, which contains graphs of IC versus GDP growth for all countries, as well as for samples grouped by regulatory quality. A positive correlation between IC and GDP is noticeable even to the naked eye: if we exclude Liberia, the cross-country correlation between GDP growth and IC is .20 and significant at 5% level. However, this relation varies significantly with the quality of institutions. As discussed earlier, we might expect a positive relation between corruption and growth in countries with rigid and cumbersome regulation. Therefore, I sort countries according to regulatory quality and find that there is a tremendous difference between the bottom half and top half of countries sorted according to this criteria: the cross-country correlation between corruption and growth is .37 and significant at 1% level for the bottom half of countries, but around zero for the top half of countries. Grouping countries into five quintiles gives similar results: the correlation is positive for the three bottom quintiles (.48, .33, and .31, respectively), and statistically insignificant from zero for the top two 2 top quintiles (-.03 and .07 respectively).

Multivariate analysis gives similar results. Table 3 contains estimations of following three regressions:

$$\Delta GDP = \alpha + \beta SysCor + \gamma IdCor + \varepsilon \tag{3}$$

$$\Delta GDP = \alpha + \beta SysCor + \gamma_1 IdCor \cdot H_1 + \gamma_2 IdCor \cdot H_2 + \varepsilon \tag{4}$$

$$\Delta GDP = \alpha + \beta SysCor + \gamma_1 IdCor \cdot Q_1 + ... + \gamma_5 IdCor \cdot Q_5 + \varepsilon \tag{5}$$

where ΔGDP is GDP growth, $SysCor$ is Systematic Corruption, $IdCor$ is Idiosyncratic Corruption, H_1 is indicator for bottom half of countries sorted by Regulatory Quality, H_2 - indicator for top half, $Q_1 - Q_5$ are indicators for 1st - 5th quintiles, sorted by Regulatory Quality.

The results presented coincide with previous findings: systematic corruption or poor institutions (SysCor is a linear combination of GE, RQ and RL) negatively affects economic growth. However, idiosyncratic corruption (IdCor) is positively related to economic growth in countries with poor quality of regulation and has no effect in countries with good regulation. In the bottom half of countries, one standard deviation of idiosyncratic corruption is associated with 1.3% annual economic growth. In the bottom quintile the effect is even stronger: it is 2.1%. When I use data for 2004 instead of the average for 1996-2004, I obtain similar results (columns 6-8 of Table 3), though using 1996, 1998, 2000 and 2002 variables separately does not give statistically significant results for idiosyncratic corruption. This might be due to the noise in the corruption measures, which might be averaged out when aggregating across years.

One might worry that measurement error would lead to bias in the coefficients. However in this case, measurement error biases against finding statistically significant results. Here is a brief intuitive explanation of why this is true. Assume that the true model of growth is,

$$y = \alpha + \beta x + \gamma z + \varepsilon$$

where y is GDP growth, x is systematic corruption and z is idiosyncratic corruption. z is not observable, one can only observe $\widetilde{z} = z + u$, where u is measurement error uncorrelated with ε. x is also measured with error ν which is uncorrelated with ε, and only $\widetilde{x} = x + \nu$ is observable. Regressing y on $\widetilde{x}$ and $\widetilde{z}$ provides biased and inconsistent estimation of γ. Since $cov(\widetilde{x}, \widetilde{z}) = 0$ by construction, the expectation of γ is:

$$\begin{aligned} E\left(\widehat{\gamma}\right) &= \frac{cov(y, \widetilde{z})}{var(\widetilde{z})} = \frac{cov(\alpha + \beta x + \gamma z + \varepsilon, z + u)}{var(z + u)} = \frac{\gamma var(z)}{var(z) + var(u)} \\ &= \gamma\left(1 - \frac{var(u)}{var(z) + var(u)}\right) = \beta\left(1 - \frac{var(u)}{var(\widetilde{z})}\right) \end{aligned}$$

Therefore if $var(u)$ is big relative to $var(z)$ we significantly underestimate β. Thus, the real positive effect of corruption in countries with poor institutions might be even stronger. These findings are quite provocative, and require further tests. These are performed in the following two subsections.

4.2 Cross Companies

For comparison, I analyze financial data of more than 9000 companies in 51 countries. The results are similar: the effect of corruption depends on institution quality. I analyze growth of asset per employee since it can be treated as capital accumulation at micro level. Table 4 contains regressions of asset growth per employee on countries' institution quality (SysCor) and corruption:

$$\Delta Asset\_per\_Employee = \alpha + \beta SysCor + \gamma IdCor + controls + \varepsilon$$

$$\Delta Asset\_per\_Employee = \alpha + \beta SysCor + \gamma_1 IdCor + \gamma_2 IdCor \cdot Low\_R\_Q + controls + \varepsilon$$

where $\Delta Asset\_per\_Employee$ is asset growth per employee, $SysCor$ is Systematic Corruption, $IdCor$ is Idiosyncratic Corruption, and Low_R_Q indicates countries with low regulatory quality.

The coefficient on idiosyncratic corruption is significant at the 10% level (see column 3). A one standard deviation increase in idiosyncratic corruption coincides with a .9% increase in growth of assets per year per employee in developing countries. These results closely resemble those of the previous section. In contrast, the effect of corruption on growth of assets is negative and statistically significant in developed countries. Excluding Japan (as it accounts for 39% of observations in this category) decreases the estimated coefficient on IdCor by a factor of four. However, it remains negative and significant at the 5% level.

The results presented might have an alternative interpretation: in countries with high corruption levels, companies might overreport value of assets. For example, a company might buy a computer with true value of $1000 for $1500 and split the remaining $500 between sales and purchasing agents. Another problem with book assets is accounting rigidity: historical costs might differ significantly from the current market price of assets. For these reasons, I consider the effect of corruption on growth of sale per employee as well. The results are displayed in Table 5.

In Table 5, we observe a similar effect of corruption on growth of sales per employee. Moreover, the coefficient on idiosyncratic corruption for developing countries (column 3) is larger–and more significant–than for growth of assets. A one standard deviation increase in idiosyncratic corruption yields an over 1.6% increase in annual sales per employee. If we treat sales per employee as a proxy for productivity, these findings support the hypothesis that corruption increases productivity in countries with inefficient regulation but has a negative impact on productivity in countries with good regulation. Thus, the results from Table 4 and Table 5 coincide with previous findings.

Another possible problem with this approach is that growth is measured in US dollars: these results might represent devaluation of currencies and nothing more. In Tables 6 and 7, I display the same regressions as above, but in local currencies. The results are similar to past findings: though the coefficient on idiosyncratic corruption (Table 6, column 3) is now statistically insignificant, it remains economically significant, and one standard deviation coincides with .6% annual growth in assets per employee. If we consider productivity growth (Table 7), the corruption coefficient for developing

countries remains significant at the 5% level (and at the 1% level in column 4). The magnitude of the coefficients is practically the same. Estimations for developed countries do not change dramatically. This is reasonable, since developed countries did not experience significant devaluation in currencies.

Finally, another potentially serious problem is sample bias. Companies presented in WorldScope are not representative companies, especially in developing countries. It might be the case that only the companies which managed to establish good relations with authorities are represented in World-Scope. However, since estimations for both level of institutions and corruption remain similar to cross-countries estimations, we may conclude that this bias does not lead to a significant distortion of estimates.

Summarizing, we may conclude that idiosyncratic corruption, or corruption which is not related to poor institutions, has a different effect on capital accumulation and productivity growth in developed and developing countries. It has a positive relation with capital accumulation and productivity growth in developing countries (controlling for other institutions) and has a negative effect on development in developed countries.

4.3 GDP Growth and Corruption. Mauro Data

Another robustness check of results is to consider how the corruption index and other governance indicators calculated in 1980 predict future economic growth. I use the Efficiency of Judiciary System, Red Tape and Corruption indicators developed in Mauro (1995) to construct systematic corruption (or level of institutions) and idiosyncratic corruption (or residual corruption). Appendix D contains graphs of the relationship between corruption and economic growth for all countries, as well as for clusters sorted by Red Tape. Results are remarkably similar to those in the previous analysis: idiosyncratic corruption has a positive effect in countries with poor institutions.

The formal estimations of specifications (3) - (5) may be found in Table 8. Not only are the signs the same for the bottom quartile of countries, but the point estimates of coefficients are very similar: a one standard deviation increase in idiosyncratic corruption (IdCor) results in a 1% increase in economic growth for the bottom quartile of countries (the bottom quartile of the Mauro sample coincides approximately with the 2nd quintile of the 1996-2003 sample). The large, but statistically insignificant estimate in the top quartile is explained solely by Hong Kong: it has one of the highest relative corruption indexes and very large economic growth over this period. Because it is in the top quartile of countries according to Red Tape, it single handedly determines the sign of the coefficient for the top quartile: excluding Hong Kong reduces the point estimate for IdCor*Q4 by a factor of almost 6.

In general, the analysis of Mauro's corruption data yields the same outcome: controlling for other countries' characteristics, idiosyncratic corruption is positively related to growth in countries with poor institutions and has zero effect in countries with good institutions.

5 Conclusion

The paper shows that different types of corruption differently affect economic development. Bad corruption, or corruption which is associated with poor institutions, has a negative impact on economic growth and capital accumulation. However, residual (idiosyncratic) corruption, or corruption which is uncorrelated with other governance characteristics, has a strong positive effect on development in countries with poor institutions. A similar analysis using Mauro's corruption data supports these findings. For policymakers, this might imply that curbing corruption without improving other institutions would have a negative effect on economic development. Another interesting finding is that residual corruption has a different effect on development in different countries: a positive effect in countries with poor institutions and negative effect in countries with developed institutions. An analysis of companies' financial data gives similar results: residual corruption is positively related to capital accumulation and productivity growth in developing countries.

The analysis contained herein assumes that poor institutions are exogenously pre-determined and does not take into account the fact that bribe-maximizing bureaucrats might push for bad laws. This problem has been suggested and analyzed in a number of theoretical studies (see, for example, Guriev, 2004), but to the best of my knowledge, no empirical work has confirmed the causal relationship between poor institutions and corruption. Nor did I find such a relationship using the described panel of governance characteristics for 1996-2004. Of course, my own search was far from conclusive, and much more research should be done on this topic.

Before closing, it is worth discussing *what* it is that I am measuring. In other words, what is *residual corruption*? The first possible explanation is that it is just measurement error. Since the correlation between the corruption index and other governance characteristics is very high (.91 in 1996 and .95 in 2004), one might argue that all governance indicators measure the same thing and that the difference between them is nothing but a difference in measurements. However, the empirical results do not support this explanation, since the relation between residual corruption and economic growth is the same for different time periods (1996-2003 and 1980-2002) and for different corruption measures (Kauffman for 1996-2004 and Mauro for 1980). The second possible explanation is that residual corruption reflects variation in anticorruption policies. For example, a country with poor

institutions might have a high level of corruption or a relatively low level of corruption depending on whether the government favors corruption or not. Using this interpretation of residual corruption, curbing corruption without improving other institutions might have a negative impact on growth. One example of extremely low corruption levels and poor institutions is Iraq in 1980s (Corruption=10, Red Tape =3, Mauro (1995)). This anomaly corresponds to a deep recession in the 1980s which cannot be solely explained by decreases in oil prices. Finally, another possible interpretation of positive relation between residual corruption and economic growth is the endogeneity of bribes. Periods of rapid economic growth are associated with a surge in economic activity, as more entrepreneurs want to start new businesses and firms need more licenses and permissions. During this time, the supply of bribes might rise. Some anecdotal evidence supports this explanation. For example, according to a survey done by the INDEM foundation, the average dollar value of business bribes in Russia increased by a factor of 13 in last four years. At the same time, Russia experienced significant economic growth due to high oil prices. This might suggest that the surge in corruption levels was caused by an increase of bribes supplied by the business community.

6 References

Acemoglu, Daren and Thierry Verdier, 2000, "The Choice between Market Failures and Corruption", The American Economic Review , Vol. 90, pp. 194-211

Acemoglu, Daren and Thierry Verdier, 1998, "Property Rights, Corruption and the Allocatioi of Talent: A General Equilibriuim Approach." Economic. Journal, Vol. 108 (450). pp. 1381-403.

Ades, Alberto, and Rafael Di Tella, 1997, "National Champions and Corruption: Some Unpleasant Interventionist Arithmetic," The Economic Journal, Vol. 107 (443): 1023-42, July.

Alesina, Alberto and Beatrice Weder, 2002, "Do Corrupt Governments Receive Less Foreign Aid?", The American Economic Review , Vol. 92, pp. 1126-1137.

Bardhan, Pranab, 1997, "Corruption and Development: A Review of Issues," Journal of Economic Literature, Vol. XXXV (September): 1320-1346

Becker, Gary and George Stigler, 1974 "Law Enforcement, Malfeasance and the Compensation of Enforcers." Journal of Legal Studies, January, 3(1), pp. 1-19.

Bliss, Christopher, and Rafael Di Tella, 1997, "Does Competition Kill Corruption?" Journal of Political Economy, December, 5(105): 1001-1023, October

Bonnett, Heidi and Michael Rock, 2004, "The Comparative Politics of Corruption: Accounting for the East Asian Paradox in Empirical Studies of Corruption, Growth and Investment", World

Development Vol. 32, No. 6, pp. 999–1017

Boycko, Maxim, Andrei Shleifer and Robert W. Vishny, 1995 "Privatizing Russia", Cambridge MA, MIT Press

Campos, Edgardo, Donald Lien and Sanjay Pradhan, 1999, "The Impact of Corruption on Investment: Predictability Matters", World Development Vol. 27, No. 6, pp. 1059-1067

Egger, Petter and Hannes Winnerb, 2005, "Evidence on corruption as an incentive for foreign direct investment", European Journal of Political Economy, forthcoming

Gaviria, Alejandro, 2002, "Assessing the effects of corruption and crime on firm performance: evidence from Latin America", Emerging Markets Review 3, pp. 245–268

Guriev, Sergei, 2004, "Red tape and corruption", Journal of Development Economics 73, pp. 489–504

Habib, M. and L. Zurawicki, 2001, "Country-level investments and the effect of corruption — some empirical evidence", International Business Review, 10, pp. 687–700

Hindriks, Jean, Michael Keen and Abhinay Muthoo, 1999, "Corruption, extortion and evasion", Journal of Public Economics, 74, 395–430

Kaufmann, Daniel , Aart Kraay, and Massimo Mastruzzi, 2005, "Governance Matters IV: Governance Indicators for 1996-2004", Worldbank

Lui, Francis, 1985, "An Equilibrium Queuing Model of Bribery", The Journal of Political Economy, Vol. 93, No. 4, pp. 760-781

Mauro, Paolo, 1995, "Corruption and Growth," Quarterly Journal of Economics, 110: 681-712

Murphy, Kevin M., Andrei Shleifer and Robert W. Vishny, 1993 "Why is Rent Seeking So Costly to Growth?", The American Economic Review , Vol. 83(2), pp. 409-414

Paldam, Martin, 2002 "The cross-country pattern of corruption: economics, culture and the seesaw dynamics", European Journal of Political Economy Vol. 18, 215–240.

Rose-Ackerman, Susan, 1975, "The Economics of Corruption", Journal of Public Economics 4, pp.187-203.

Rose-Ackerman, Susan, 1978 "Corruption: A Study in Political Economy", Academic Press, New York.

Shleifer, Andrei and Robert W. Vishny, 1993, "Corruption," Quarterly Journal of Economics, 108: 599-617.

Shleifer, Andrei and Robert W. Vishny, 1994, "Politicians and Firms," Quarterly Journal of Economics, November.

Shleifer, Andrei and Shang-Jin Wei, 2000 "Local Corruption and Global Capital Flows", Brooking

Papers on Economic Activity, 2, 303-354.

Wei, Shang-Jin, 1998, "Corruption in Economic Development: Beneficial Grease, Minor Annoyance, or Major Obstacle?", working paper

A Appendix

Table1. Governance characteristics and corruption, 2004

Country	Government Effectiveness (1)	Regulatory Quality (2)	Rule of Law (3)	Control of Corruption (4)	Systematic Corruption (5)	Idiosyncratic Corruption (6)
AFGHANISTAN	−1.24	−2.05	−1.81	−1.33	1.45	−0.32
ALBANIA	−0.36	−0.08	−0.8	−0.72	0.58	0.6
ALGERIA	−0.46	−0.93	−0.73	−0.49	0.55	−0.17
ANDORRA	1.4	1.32	1.43	1.17	−1.43	0.89
ANGOLA	−1.14	−1.4	−1.33	−1.12	1.21	−0.22
ANTIGUA AND BARBUDA	0.31	0.73	0.91	0.88	−0.57	−1.27
ARGENTINA	−0.33	−0.81	−0.71	−0.44	0.47	−0.07
ARMENIA	−0.34	0.05	−0.58	−0.53	0.48	0.26
AUSTRALIA	1.95	1.62	1.82	2.02	−1.92	−0.57
AUSTRIA	1.76	1.41	1.76	2.1	−1.8	−1.38
AZERBAIJAN	−0.81	−0.57	−0.85	−1.04	0.84	0.87
BAHAMAS	1.27	0.78	1.28	1.36	−1.32	−0.28
BAHRAIN	0.76	0.71	0.68	0.76	−0.73	−0.17
BANGLADESH	−0.72	−1.15	−0.86	−1.09	0.75	1.43
BARBADOS	1.18	0.91	1.21	0.81	−1.22	1.52
BELARUS	−0.93	−1.78	−1.31	−0.91	1.04	−0.42
BELGIUM	1.71	1.25	1.47	1.53	−1.64	0.27
BELIZE	0.16	0.32	0.25	−0.07	−0.2	1.05
BENIN	−0.39	−0.49	−0.47	−0.34	0.41	−0.25
BHUTAN	−0.14	0	0.27	0.69	−0.05	−2.53
BOLIVIA	−0.63	0.05	−0.55	−0.78	0.64	0.63
BOSNIA-HERZEGOVINA	−0.54	−0.66	−0.76	−0.54	0.63	−0.29
BOTSWANA	0.83	0.96	0.73	0.86	−0.78	−0.39
BRAZIL	0.02	0.19	−0.21	−0.15	0.09	0.23
BRUNEI	0.73	1.08	0.56	0.23	−0.63	1.53
BULGARIA	−0.08	0.6	0.05	−0.04	0.06	−0.08
BURKINA FASO	−0.52	−0.26	−0.62	−0.35	0.58	−0.85
BURUNDI	−1.24	−1.35	−1.5	−1.16	1.35	−0.62
CAMBODIA	−0.87	−0.25	−0.98	−0.97	0.96	0.12
CAMEROON	−0.64	−0.71	−1	−0.78	0.8	0
CANADA	1.96	1.57	1.75	1.99	−1.9	−0.55

Country	(1)	(2)	(3)	(4)	(5)	(6)
CAPE VERDE	−0.19	0.27	0.26	0.31	0	−1.23
CENTRAL AFRICAN REPUBLIC	−1.65	−1.28	−1.44	−1.36	1.57	−0.68
CHAD	−1.29	−0.84	−1.15	−1.14	1.25	−0.31
CHILE	1.27	1.62	1.16	1.44	−1.2	−1.07
CHINA	0.11	−0.45	−0.47	−0.51	0.12	1.57
COLOMBIA	−0.18	−0.12	−0.7	−0.16	0.43	−1.01
COMOROS	−1.45	−1.06	−1.04	−1.14	1.28	−0.42
CONGO	−1.17	−1.16	−1.18	−1.02	1.17	−0.48
CONGO, DEM. REP.	−1.41	−1.8	−1.74	−1.31	1.53	−0.73
COSTA RICA	0.49	0.67	0.57	0.78	−0.52	−1.07
COTE D'IVOIRE	−1.3	−0.83	−1.42	−1.01	1.39	−1.36
CROATIA	0.32	0.19	0.07	0.08	−0.22	0.53
CUBA	−0.47	−1.81	−1.12	−0.62	0.67	−0.14
CYPRUS	1.02	1.23	0.85	0.8	−0.93	0.43
CZECH REPUBLIC	0.63	0.97	0.69	0.3	−0.64	1.29
DENMARK	2.15	1.76	1.91	2.38	−2.08	−1.41
DJIBOUTI	−0.76	−0.76	−0.61	−0.94	0.68	1.09
DOMINICA	0.31	0.53	0.66	0.25	−0.47	0.82
DOMINICAN REPUBLIC	−0.46	−0.28	−0.54	−0.5	0.5	0.03
ECUADOR	−0.85	−0.6	−0.71	−0.75	0.8	−0.1
EGYPT	−0.2	−0.58	−0.02	−0.21	0.08	0.53
EL SALVADOR	−0.22	0.56	−0.34	−0.39	0.33	0.28
EQUATORIAL GUINEA	−1.4	−0.78	−1.05	−1.65	1.27	1.62
ERITREA	−1.05	−1.29	−0.78	−0.64	0.9	−0.93
ESTONIA	0.99	1.61	0.91	0.82	−0.91	0.28
ETHIOPIA	−0.96	−1.19	−1	−0.85	0.96	−0.32
FIJI	−0.57	−0.36	−0.19	−0.14	0.4	−0.98
FINLAND	2.06	1.79	1.97	2.53	−2.05	−2.11
FRANCE	1.42	0.91	1.33	1.44	−1.43	−0.2
GABON	−0.53	−0.46	−0.51	−0.58	0.52	0.3
GAMBIA	−0.49	−0.15	−0.32	−0.61	0.43	0.77
GEORGIA	−0.8	−0.64	−0.87	−0.91	0.84	0.37
GERMANY	1.38	1.29	1.66	1.9	−1.53	−1.61

Country	(1)	(2)	(3)	(4)	(5)	(6)
GHANA	−0.17	−0.28	−0.16	−0.17	0.15	0.1
GREECE	0.74	0.85	0.75	0.56	−0.75	0.66
GRENADA	0.1	0.37	0.46	0.52	−0.26	−1.06
GUATEMALA	−0.87	−0.07	−0.96	−0.74	0.97	−0.8
GUINEA	−0.93	−0.94	−1.09	−0.81	1	−0.65
GUINEA-BISSAU	−1.25	−0.86	−1.26	−0.71	1.28	−2.12
GUYANA	−0.2	−0.14	−0.48	−0.35	0.33	0.11
HAITI	−1.9	−1.11	−1.66	−1.49	1.84	−1.2
HONDURAS	−0.68	−0.33	−0.61	−0.71	0.67	0.24
HONG KONG	1.49	1.89	1.42	1.57	−1.44	−0.67
HUNGARY	0.68	1.22	0.85	0.65	−0.73	0.24
ICELAND	2.18	1.82	2.01	2.43	−2.14	−1.37
INDIA	−0.04	−0.59	−0.09	−0.31	0.01	1.17
INDONESIA	−0.36	−0.42	−0.91	−0.9	0.61	1.2
IRAN	−0.66	−1.33	−0.83	−0.59	0.68	−0.3
IRAQ	−1.51	−1.79	−1.97	−1.45	1.7	−0.84
IRELAND	1.48	1.63	1.62	1.61	−1.55	−0.41
ISRAEL	0.98	0.69	0.77	0.79	−0.91	0.39
ITALY	0.58	0.97	0.74	0.66	−0.64	−0.16
JAMAICA	0.13	0.15	−0.32	−0.52	0.08	1.76
JAPAN	1.21	1.04	1.39	1.19	−1.32	0.38
JORDAN	0.23	0.13	0.3	0.35	−0.28	−0.31
KAZAKHSTAN	−0.63	−0.89	−0.98	−1.1	0.77	1.38
KENYA	−0.81	−0.43	−0.98	−0.89	0.91	0
KIRIBATI	−0.61	−0.49	0.25	−0.02	0.2	−0.69
KOREA, NORTH	−1.68	−2.05	−1.15	−1.46	1.39	0.4
KOREA, SOUTH	0.95	0.69	0.67	0.17	−0.85	2.59
KUWAIT	0.55	0.1	0.65	0.71	−0.64	−0.34
KYRGYZ REPUBLIC	−0.83	−0.06	−1.04	−0.92	0.98	−0.15
LAOS	−1.02	−1.24	−1.27	−1.15	1.12	0.24
LATVIA	0.6	1.02	0.48	0.23	−0.52	1.1
LEBANON	−0.33	−0.49	−0.32	−0.51	0.31	0.84
LESOTHO	−0.33	−0.26	−0.03	−0.05	0.18	−0.51

Country	(1)	(2)	(3)	(4)	(5)	(6)
LIBERIA	−1.86	−1.83	−1.76	−0.86	NaN	NaN
LIBYA	−0.73	−1.52	−0.65	−0.91	0.63	1.19
LIECHTENSTEIN	1.48	1.62	1.36	1.69	−1.42	−1.2
LITHUANIA	0.7	1.16	0.6	0.36	−0.63	0.99
LUXEMBOURG	2.08	2.02	1.98	2.16	−2.05	−0.65
MACEDONIA	−0.17	−0.19	−0.44	−0.52	0.29	0.94
MADAGASCAR	−0.43	0.1	−0.3	−0.15	0.4	−0.95
MALAWI	−0.81	−0.57	−0.29	−0.83	0.57	1.08
MALAYSIA	0.99	0.44	0.52	0.29	−0.82	2
MALDIVES	0.47	0	−0.57	0.12	−0.02	−0.41
MALI	−0.29	−0.26	−0.34	−0.52	0.31	0.87
MALTA	1.03	1.3	1.23	1.25	−1.12	−0.65
MARSHALL ISLANDS	−0.46	−0.55	−0.11	−0.84	0.28	2.25
MAURITANIA	0.22	0.04	−0.62	0.02	0.16	−0.7
MAURITIUS	0.6	0.33	0.84	0.33	−0.74	1.57
MEXICO	−0.02	0.55	−0.26	−0.27	0.17	0.41
MICRONESIA	−0.33	0.04	0.4	−0.3	0	1.19
MOLDOVA	−0.73	−0.49	−0.65	−0.86	0.7	0.69
MONACO	1.42	NaN	0.77	NaN	NaN	NaN
MONGOLIA	−0.46	0.18	0.18	−0.51	0.19	1.27
MOROCCO	−0.03	−0.26	−0.05	−0.02	0.01	0.02
MOZAMBIQUE	−0.39	−0.29	−0.6	−0.79	0.49	1.24
MYANMAR	−1.57	−2.34	−1.62	−1.49	1.53	−0.01
NAMIBIA	0.29	0.45	0.22	0.18	−0.25	0.26
NAURU	−1.36	NaN	0.77	NaN	NaN	NaN
NEPAL	−0.9	−0.6	−0.82	−0.61	0.88	−0.97
NETHERLANDS	2	1.67	1.78	2.08	−1.93	−0.78
NEW ZEALAND	2.05	1.78	1.93	2.38	−2.02	−1.61
NICARAGUA	−0.71	−0.15	−0.65	−0.34	0.72	−1.42
NIGER	−0.87	−0.63	−0.92	−0.87	0.91	−0.05
NIGERIA	−1.02	−1.26	−1.44	−1.11	1.2	−0.22
NORWAY	1.97	1.33	1.95	2.11	−2.02	−0.56
OMAN	0.91	0.43	0.98	0.78	−0.99	0.73

Country	(1)	(2)	(3)	(4)	(5)	(6)
PAKISTAN	−0.57	−1.03	−0.78	−0.87	0.63	1.02
PANAMA	0.01	0.22	−0.04	−0.06	0.02	0.15
PAPUA NEW GUINEA	−1.01	−0.64	−0.82	−0.9	0.94	−0.07
PARAGUAY	−1.07	−0.6	−1.09	−0.99	1.11	−0.36
PERU	−0.58	0.17	−0.63	−0.35	0.65	−1.14
PHILIPPINES	−0.23	−0.06	−0.62	−0.55	0.42	0.55
POLAND	0.47	0.64	0.51	0.16	−0.49	1.24
PORTUGAL	0.92	1.14	1.16	1.23	−1.03	−0.9
PUERTO RICO	1.05	0.75	0.74	0.88	−0.93	0.12
QATAR	0.87	−0.16	0.79	0.55	−0.92	1.37
ROMANIA	−0.15	−0.06	−0.18	−0.25	0.16	0.36
RUSSIA	−0.21	−0.51	−0.7	−0.72	0.41	1.25
RWANDA	−0.56	−0.42	−0.9	−0.36	0.73	−1.38
SAMOA	0.09	0.39	0.62	0.05	−0.33	1.08
SAN MARINO	−0.23	NaN	0.77	NaN	NaN	NaN
SAO TOME AND PRINCIPE	−0.89	−0.47	−0.55	−0.66	0.75	−0.29
SAUDI ARABIA	−0.06	−0.34	0.2	0.15	−0.09	−0.23
SENEGAL	−0.13	−0.31	−0.2	−0.4	0.14	1.04
SEYCHELLES	−0.31	−1.21	−0.17	0.01	0.17	−0.69
SIERRA LEONE	−1.32	−1.02	−1.1	−0.88	1.23	−1.27
SINGAPORE	2.25	1.87	1.82	2.44	−2.08	−1.62
SLOVAK REPUBLIC	0.67	1.15	0.49	0.39	−0.56	0.61
SLOVENIA	1.02	0.89	0.93	0.97	−1	0.01
SOLOMON ISLANDS	−1.76	−1.47	−1.15	−1.23	1.48	−0.86
SOMALIA	−2.32	−2.63	−2.31	−1.58	2.29	−2.58
SOUTH AFRICA	0.74	0.44	0.32	0.48	−0.57	0.3
SPAIN	1.29	1.13	1.12	1.45	−1.23	−0.99
SRI LANKA	−0.27	0.21	−0.03	−0.16	0.18	−0.08
ST. KITTS AND NEVIS	−0.16	0.44	0.71	0.34	−0.22	−0.5
ST. LUCIA	0.19	0.46	0.75	0.29	−0.45	0.57
ST. VINCENT AND THE GRENADINES	0.23	0.48	0.76	0.34	−0.47	0.48
SUDAN	−1.28	−1.04	−1.59	−1.3	1.44	−0.41
SURINAME	−0.23	−0.52	−0.25	0.36	0.21	−2.24

Country	(1)	(2)	(3)	(4)	(5)	(6)
SWAZILAND	−0.6	−0.36	−0.95	−0.95	0.78	0.76
SWEDEN	1.92	1.54	1.85	2.2	−1.93	−1.28
SWITZERLAND	2.25	1.55	1.98	2.17	−2.19	−0.16
SYRIA	−0.72	−1.21	−0.4	−0.74	0.52	0.91
TAIWAN	1.15	1.29	0.83	0.64	−1	1.31
TAJIKISTAN	−1.05	−1.16	−1.18	−1.11	1.1	0.16
TANZANIA	−0.37	−0.55	−0.49	−0.57	0.41	0.69
THAILAND	0.38	−0.01	−0.05	−0.25	−0.21	1.81
TOGO	−1.31	−0.77	−1.01	−0.92	1.2	−0.99
TONGA	−0.73	−0.43	−0.11	−0.68	0.45	0.96
TRINIDAD AND TOBAGO	0.47	0.61	0.17	0.02	−0.32	1.18
TUNISIA	0.57	−0.22	0.24	0.29	−0.48	0.71
TURKEY	0.01	−0.07	0.04	−0.23	−0.04	1.06
TURKMENISTAN	−1.37	−2.22	−1.43	−1.34	1.33	0.18
TUVALU	−0.79	0.76	0.76	−0.78	0.16	2.48
UGANDA	−0.43	0.07	−0.79	−0.71	0.63	0.37
UKRAINE	−0.67	−0.48	−0.83	−0.89	0.75	0.61
UNITED ARAB EMIRATES	1.2	0.95	0.85	1.23	−1.06	−0.77
UNITED KINGDOM	1.85	1.62	1.71	2.06	−1.81	−1.17
UNITED STATES	1.8	1.22	1.58	1.83	−1.75	−0.49
URUGUAY	0.52	0.3	0.42	0.5	−0.5	−0.06
UZBEKISTAN	−1.04	−2.1	−1.3	−1.21	1.08	0.63
VANUATU	−0.6	−0.33	−0.07	−0.53	0.36	0.71
VENEZUELA	−0.96	−1.24	−1.1	−0.94	1	−0.14
VIETNAM	−0.31	−0.57	−0.59	−0.74	0.42	1.32
WEST BANK/GAZA	−1.05	−1.02	−0.95	−0.6	1	−1.48
YEMEN	−0.84	−1.04	−1.11	−0.84	0.95	−0.33
YUGOSLAVIA (Serbia and Montenegro)	−0.21	−0.72	−0.72	−0.48	0.41	0.33
ZAMBIA	−0.84	−0.49	−0.54	−0.74	0.72	0.17
ZIMBABWE	−1.2	−2.15	−1.53	−1.01	1.28	−0.94

Source: (1) - (4) Kaufmann, Kraay, and Mastruzzi (2005). Systematic Corruption (5) constructed as described in section Data, Idiosyncratic corruption (6) is difference between Corruption index (- Control of corruption) and Systematic Corruption.

Table 2

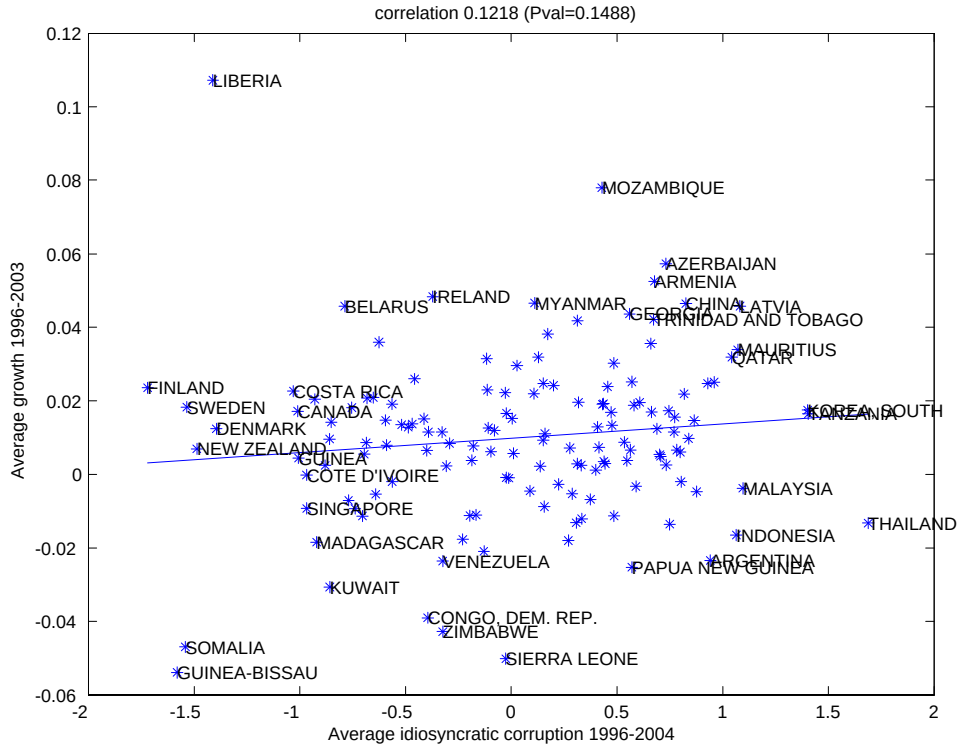
	Asset growth per employee (average 1999-2004)			Sales growth per employee (average 1999-2004)		
Country	N_obs (1)	USD (2)	Local cur (3)	N_obs (4)	USD (5)	Local cur (6)
ARGENTINA	6	−0.07	0.15	6	−0.04	0.18
AUSTRALIA	64	0.11	0.09	62	0.09	0.07
AUSTRIA	68	0.04	0.01	71	0.04	0.01
BELGIUM	101	0.04	0.02	100	0.05	0.03
BRAZIL	55	0	0.08	56	0.04	0.12
CANADA	195	0.07	0.03	189	0.1	0.06
CHILE	6	0.07	0.1	6	0.05	0.07
CHINA	718	0.13	0.13	713	0.15	0.15
COLOMBIA	11	−0.01	0.11	11	0.03	0.15
CZECH REPUBLIC	28	0.11	0.07	28	0.12	0.08
DENMARK	142	0.08	0.04	163	0.08	0.04
FINLAND	131	0.07	0.02	132	0.09	0.04
FRANCE	575	0.03	0.01	590	0.03	0.01
GERMANY	614	0.05	0.02	611	0.05	0.02
GREECE	73	0.04	0.02	73	0.03	0.01
HONG KONG	148	−0.01	−0.01	149	−0.01	−0.01
HUNGARY	25	0.16	0.14	25	0.12	0.11
INDIA	57	0.1	0.1	57	0.12	0.13
INDONESIA	71	0.04	0.05	73	0.1	0.11
IRELAND	53	0.06	0.02	47	0.08	0.05
ISRAEL	12	0.05	0.06	13	−0.03	−0.02
ITALY	202	0.08	0.04	212	0.08	0.04
JAPAN	2997	−0.04	−0.06	3009	−0.03	−0.06
JORDAN	1	0.09	0.09	1	0	0
KOREA, SOUTH	366	0.06	0.05	366	0.1	0.09
LUXEMBOURG	14	0.14	0.12	13	0.1	0.08
MALAYSIA	58	0.02	0.02	59	0.01	0.01
MEXICO	32	0.01	0.04	32	0.01	0.03

Country	(1)	(2)	(3)	(4)	(5)	(6)
MOROCCO	1	0.09	0.08	1	0.07	0.06
NETHERLANDS	156	0.06	0.03	156	0.04	0.02
NEW ZEALAND	10	0.08	0.04	10	0.14	0.1
NORWAY	102	0.07	0.03	120	0.09	0.05
PAKISTAN	38	0.09	0.12	38	0.08	0.11
PERU	30	0	0	32	0.04	0.04
PHILIPPINES	66	−0.06	0	63	−0.04	0.03
POLAND	35	0.11	0.11	35	0.07	0.07
PORTUGAL	44	0.06	0.03	44	0.06	0.03
RUSSIA	11	0.08	0.15	11	0.16	0.23
SINGAPORE	50	−0.02	−0.02	50	−0.02	−0.02
SLOVAK REPUBLIC	6	0.09	0.07	6	0.13	0.11
SOUTH AFRICA	112	0.08	0.09	111	0.1	0.11
SPAIN	123	0.07	0.05	123	0.07	0.04
SRI LANKA	7	0.05	0.12	7	0.04	0.11
SWEDEN	228	0.06	0.02	226	0.08	0.04
SWITZERLAND	175	0.06	0.01	176	0.06	0.01
THAILAND	60	0	0.01	61	0.01	0.02
TURKEY	75	0.12	0.42	77	0.1	0.4
UNITED KINGDOM	1047	0.07	0.05	1009	0.06	0.04
UNITED STATES	478	0.07	0.07	479	0.05	0.05
VENEZUELA	5	0.11	0.32	5	0.09	0.31
ZIMBABWE	7	0.15	0.95	7	0.21	1.01

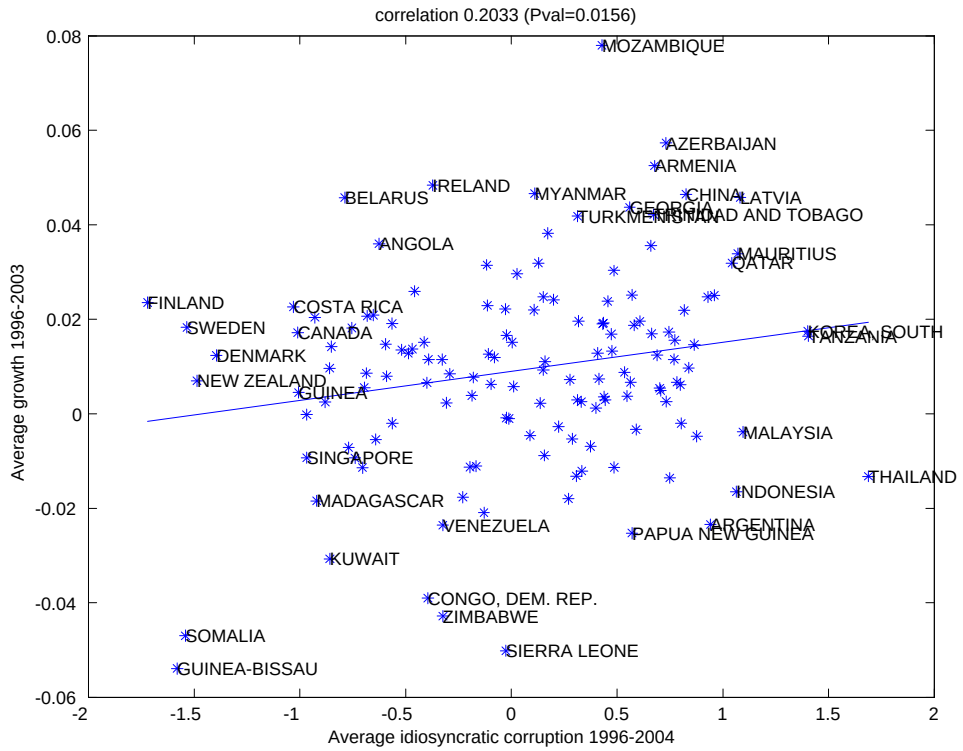
Source: Worldscope.

B Appendix

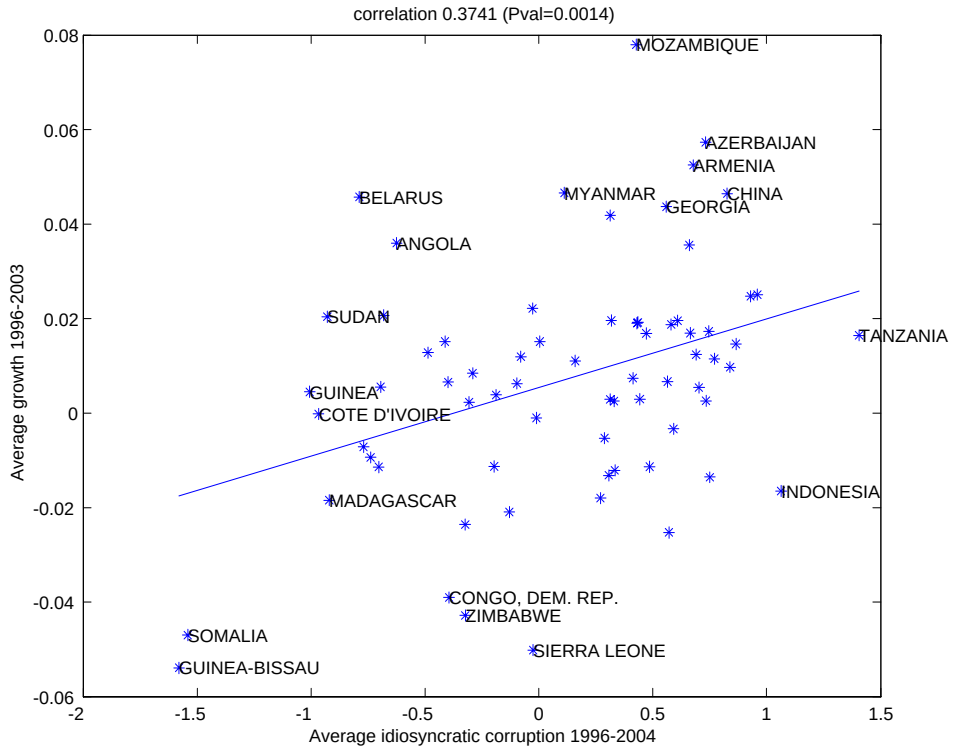
GDP growth and idiosyncratic corruption. All countries.



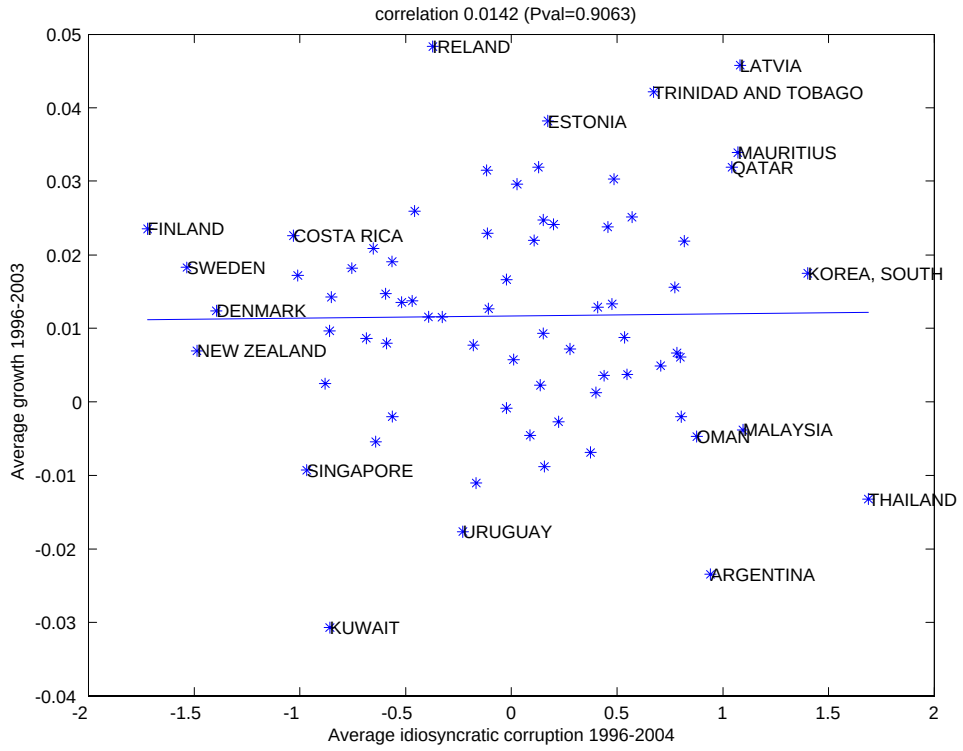
GDP growth and idiosyncratic corruption. All countries without Liberia (it had more than 50% growth in 1997).



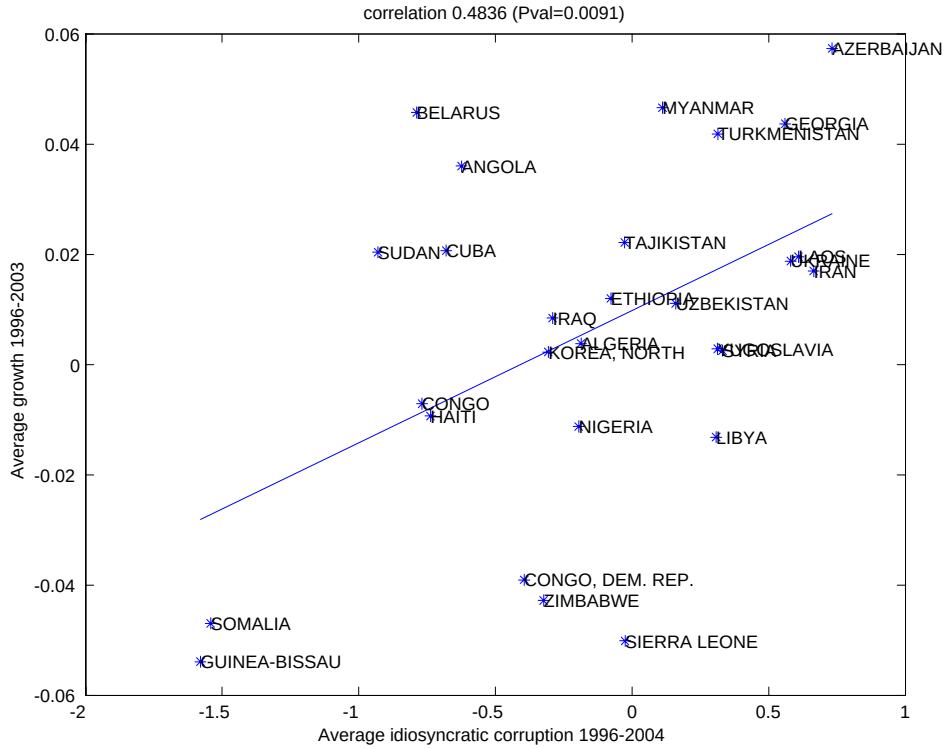
GDP growth and corruption, bottom half of countries, sorted by Regulatory Quality



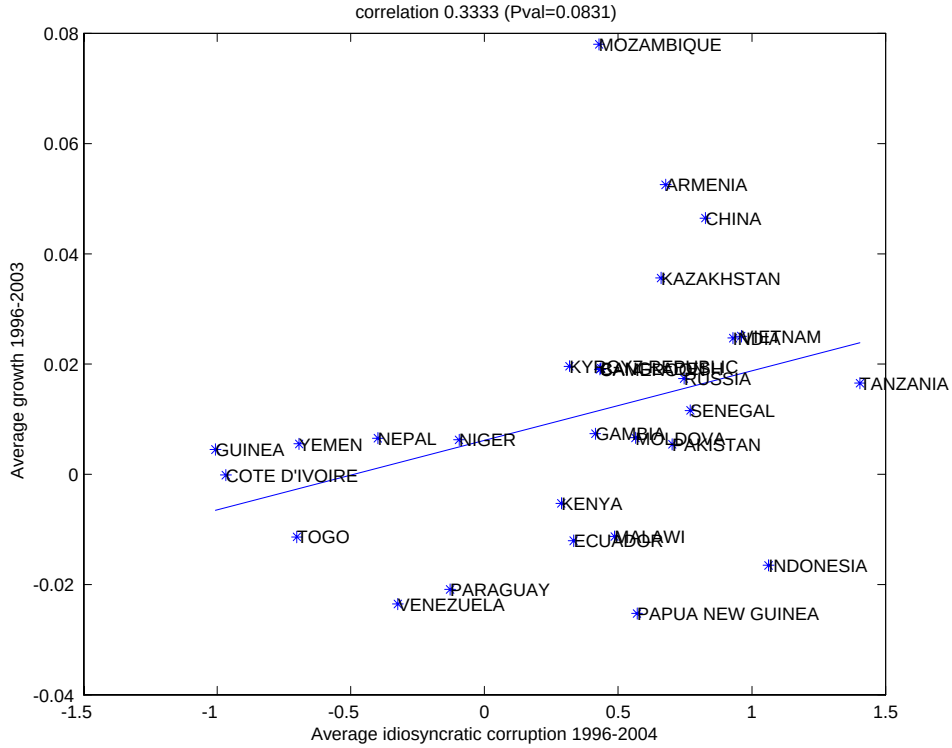
GDP growth and corruption, top half of countries, sorted by Regulatory Quality



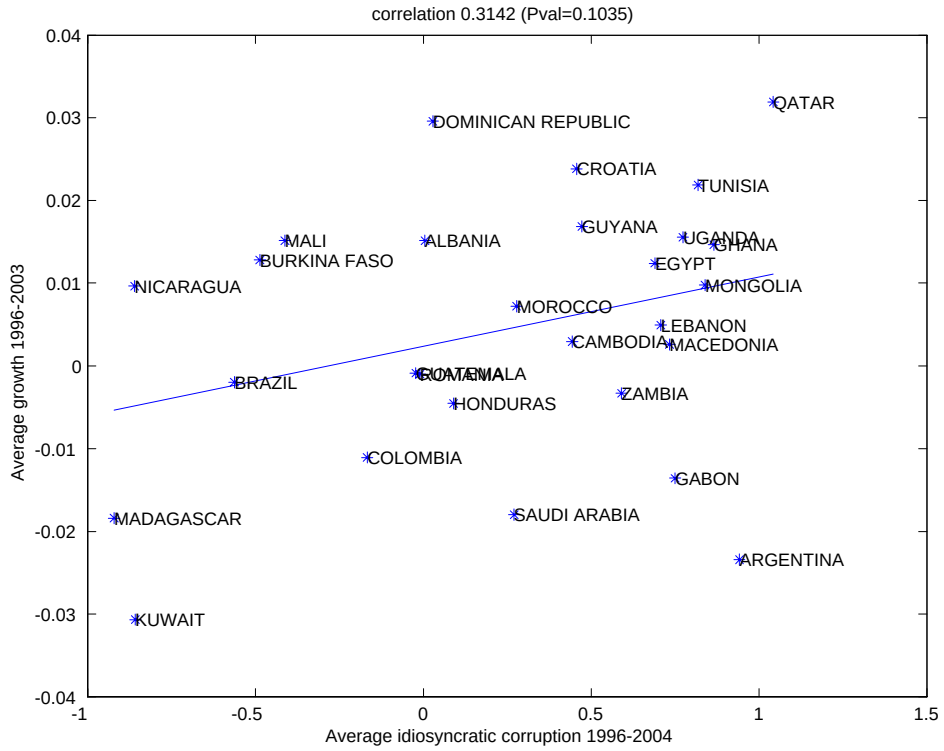
GDP growth and corruption, bottom quintile of countries, sorted by Regulatory Quality (without Somalia and Guinea-Bissau, correlation drops to .24)



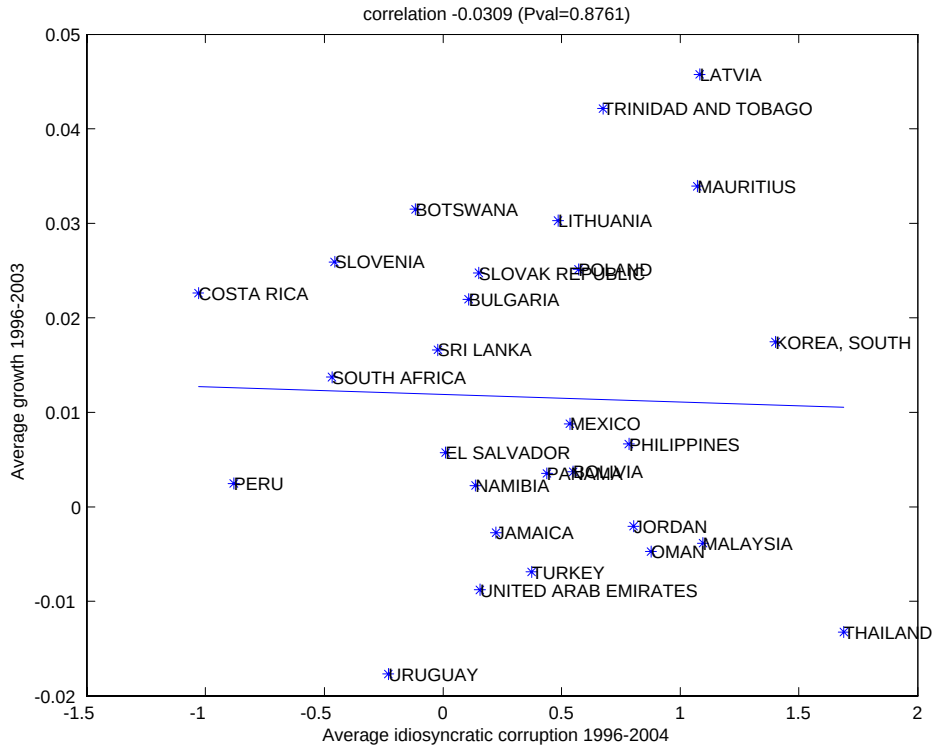
GDP growth and corruption, 2nd quintile of countries, sorted by Regulatory Quality



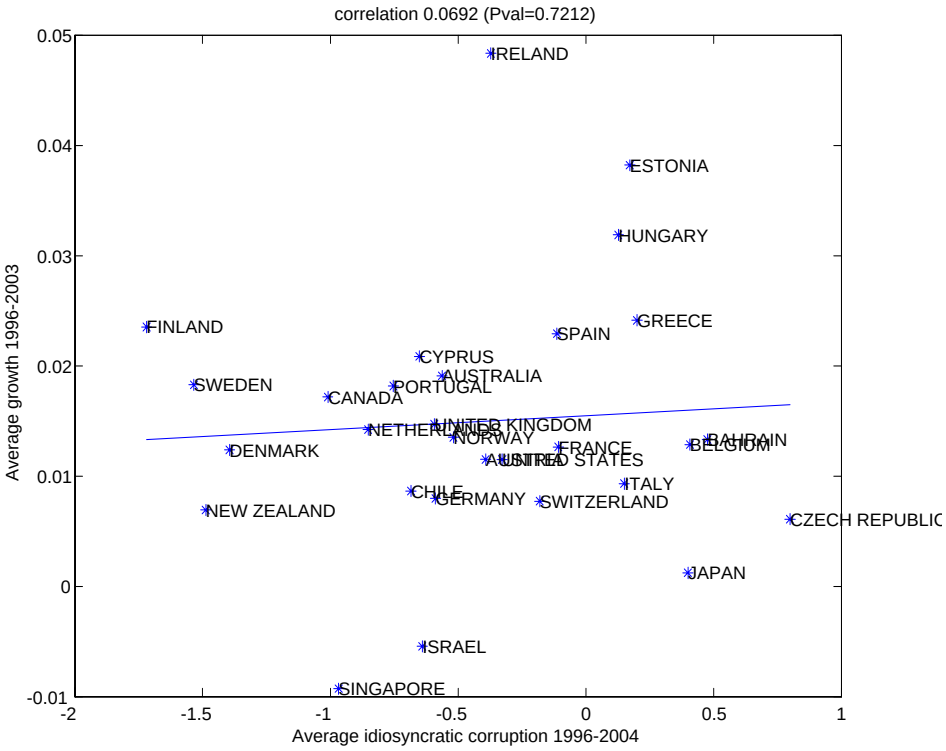
GDP growth and corruption, 3rd quintile of countries, sorted by Regulatory Quality



GDP growth and corruption, 4th quintile of countries, sorted by Regulatory Quality



GDP growth and corruption, top quintile of countries, sorted by Regulatory Quality



C Appendix

Table 3

Dependent variable: average GDP growth 1996-2003								
Independent	Explanatory variables: average 1996-2004					Explanatory variables: 2004		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.009	0.012	0.009	0.009	0.009	0.01	0.01	0.01
	$(5.51)^{***}$	$(5.06)^{***}$	$(5.41)^{***}$	$(5.25)^{***}$	$(5.68)^{***}$	$(6.25)^{***}$	$(6.28)^{***}$	$(6.38)^{***}$
SysCor	−0.004		−0.005	−0.004	−0.003	−0.005	−0.004	−0.005
	$(-2.34)^{**}$		$(-2.78)^{***}$	$(-2.28)^{**}$	$(-1.72)^{*}$	$(-3.31)^{***}$	$(-2.56)^{**}$	$(-2.43)^{**}$
SysCor*H1		−0.008						
		(−1.57)						
SysCor*H2		−0.002						
		(−1.1)						
IdCor			0.007			0.006		
			$(2.61)^{***}$			$(3.25)^{***}$		
IdCor*H1				0.013			0.012	
				$(2.95)^{***}$			$(3.73)^{***}$	
IdCor*H2				0.002			0.002	
				(0.81)			(1.22)	
IdCor*Q1					0.021			0.014
					$(2.71)^{***}$			$(2.94)^{***}$
IdCor*Q2					0.011			0.015
					$(2.18)^{**}$			$(3.64)^{***}$
IdCor*Q3					0.004			−0.001
					(0.7)			(−0.34)
IdCor*Q4					0			0.003
					(0.01)			(0.9)
IdCor*Q5					0.001			0.006
					(0.43)			$(1.72)^{*}$
R-squared	0.037	0.045	0.093	0.12	0.15	0.128	0.166	0.189
Num of obs	141	141	141	141	141	155	155	155

SysCor - Systematic Corruption, IdCor - Idiosyncratic corruption, H1 is indicator for bottom half of countries sorted by Regulatory Quality, H2 - indicator for top half, Q1-Q5 are indicators for 1st - 5th quintiles, sorted by Regulatory Quality. All t-stats are White corrected.

Table 4

	Dependent variable: Growth Assets per Employee 1999-2004 (USD), annualized					
	All countries		Developing		Developed	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.017	0.919	0.835	0.781	−1.462	−1.452
	$(15.65)^{***}$	$(12.4)^{***}$	$(7.39)^{***}$	$(8.01)^{***}$	$(-7.32)^{***}$	$(-7.36)^{***}$
SysCor	−0.06	−0.05	−0.075	−0.076	0.012	0.01
	$(-9)^{***}$	$(-6.7)^{***}$	$(-5.35)^{***}$	$(-5.6)^{***}$	(1.2)	(1.02)
IdCor	−0.012	−0.023	0.009	0.007	−0.063	−0.069
	$(-3.8)^{***}$	$(-4.51)^{***}$	$(1.83)^{*}$	(1.54)	$(-13.54)^{***}$	$(-14.64)^{***}$
IdCor*Low_R_Q		0.019				
		$(2.68)^{***}$				
Controls						
log (GDP per capita)	Y	Y	Y	Y	Y	Y
Industry	Y	Y	Y	N	Y	N
log (Asset, USD)	Y	Y	Y	Y	Y	Y
R-squared	0.087	0.087	0.085	0.028	0.116	0.075
Number of obs.	9689	9689	2004	2004	7685	7685
Number of countries	51	51	28	28	23	23

SysCor - Systematic Corruption, IdCor - Idiosyncratic corruption, SysCor and IdCor are average for 2000-2004. All t-stats are calculated clustering observations by country. Countries, which have GDP per capita > $18000 considered as developed (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States). Otherwise, the country is considered as developing (Argentina, Brazil, Chile, China, Colombia, Czech Republic, Greece, Hungary, India, Indonesia, Jordan, Korea, South, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Portugal, Russia, Slovak Republic, South Africa, Sri Lanka, Thailand, Turkey, Venezuela, Zimbabwe). Low_R_Q is indicator variable for countries where Regulatory Quality in 2004 less than 1.2 Countries with high Regulatory Qualities are: Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, Germany, Hong Kong, Hungary, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, United Kingdom, United States. The rest is considered as countries with low R_Q, Industry is dummy for first two digits of SiC code.

Table 5

	Dependent variable: Growth Sales per Employee 1999-2004 (USD), annualized					
	All countries		Developing		Developed	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.147	0.927	0.653	0.634	−1.033	−1.163
	$(18.31)^{***}$	$(12.77)^{***}$	$(5.13)^{***}$	$(6.49)^{***}$	$(-5.69)^{***}$	$(-6.56)^{***}$
SysCor	−0.056	−0.034	−0.042	−0.041	0.011	0.011
	$(-9.08)^{***}$	$(-4.82)^{***}$	$(-3.04)^{***}$	$(-3.04)^{***}$	(1.27)	(1.17)
IdCor	−0.013	−0.039	0.016	0.018	−0.066	−0.07
	$(-4.27)^{***}$	$(-7.73)^{***}$	$(3.08)^{***}$	$(4.01)^{***}$	$(-14.9)^{***}$	$(-16.07)^{***}$
IdCor*Low_R_Q		0.042				
		$(5.95)^{***}$				
Controls						
log (GDP per capita)	Y	Y	Y	Y	Y	Y
Industry	Y	Y	Y	N	Y	N
log (Asset, USD)	Y	Y	Y	Y	Y	Y
R-squared	0.102	0.105	0.1	0.03	0.122	0.089
Number of obs	9714	9714	2004	2004	7710	7710
Number of countries	51	51	28	28	23	23

SysCor - Systematic Corruption, IdCor - Idiosyncratic corruption, SysCor and IdCor are average for 2000-2004. All t-stats are calculated clustering observations by country. Countries, which have GDP per capita > $18000 considered as developed (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States). Otherwise, the country is considered as developing (Argentina, Brazil, Chile, China, Colombia, Czech Republic, Greece, Hungary, India, Indonesia, Jordan, Korea, South, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Portugal, Russia, Slovak Republic, South Africa, Sri Lanka, Thailand, Turkey, Venezuela, Zimbabwe). Low_R_Q is indicator variable for countries where Regulatory Quality in 2004 less than 1.2 Countries with high Regulatory Qualities are: Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, Germany, Hong Kong, Hungary, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, United Kingdom, United States. The rest is considered as countries with low R_Q , Industry is dummy for first two digits of SiC code.

Table 6

	Dependent variable: Growth Assets per Employee 1999-2004 (local currency), annualized					
	All countries		Developing		Developed	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.969	0.871	0.28	0.227	−1.81	−1.806
	$(15.25)^{***}$	$(11.98)^{***}$	$(2.3)^{**}$	$(2.12)^{**}$	$(-8.98)^{***}$	$(-9.12)^{***}$
SysCor	−0.014	−0.004	0.061	0.06	0.018	0.017
	$(-1.88)^{*}$	(−0.54)	$(3.24)^{***}$	$(3.23)^{***}$	$(1.9)^{*}$	$(1.7)^{*}$
IdCor	−0.022	−0.034	0.006	0.003	−0.06	−0.066
	$(-6.39)^{***}$	$(-6.35)^{***}$	(1.17)	(0.62)	$(-13.1)^{***}$	$(-14.31)^{***}$
IdCor*Low_R_Q		0.019				
		$(2.57)^{**}$				
Controls						
log (GDP per capita)	Y	Y	Y	Y	Y	Y
Industry	Y	Y	Y	N	Y	N
log (Asset, USD)	Y	Y	Y	Y	Y	Y
R-squared	0.115	0.115	0.078	0.031	0.11	0.069
Number of obs.	9689	9689	2004	2004	7685	7685
Number of countries	51	51	28	28	23	23

SysCor - Systematic Corruption, IdCor - Idiosyncratic corruption, SysCor and IdCor are average for 2000-2004. All t-stats are calculated clustering observations by country. Countries, which have GDP per capita > $18000 considered as developed (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States). Otherwise, the country is considered as developing (Argentina, Brazil, Chile, China, Colombia, Czech Republic, Greece, Hungary, India, Indonesia, Jordan, Korea, South, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Portugal, Russia, Slovak Republic, South Africa, Sri Lanka, Thailand, Turkey, Venezuela, Zimbabwe). Low_R_Q is indicator variable for countries where Regulatory Quality in 2004 less than 1.2 Countries with high Regulatory Qualities are: Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, Germany, Hong Kong, Hungary, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, United Kingdom, United States. The rest is considered as countries with low R_Q, Industry is dummy for first two digits of SiC code.

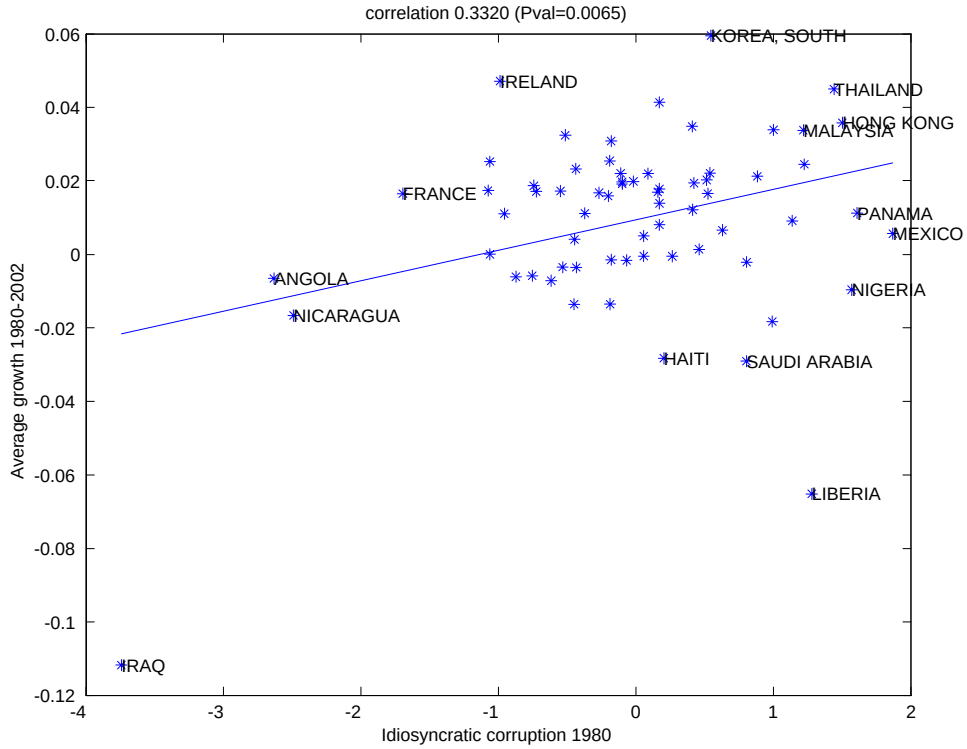
Table 7

	Dependent variable: Growth Sales per Employee 1999-2004 (local currency), annualized					
	All countries		Developing		Developed	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.097	0.878	0.1	0.083	−1.371	−1.501
	$(17.71)^{***}$	$(12.22)^{***}$	(0.75)	(0.77)	$(-7.57)^{***}$	$(-8.53)^{***}$
SysCor	−0.011	0.011	0.094	0.095	0.018	0.017
	(−1.53)	(1.51)	$(5.12)^{***}$	$(5.25)^{***}$	$(2.1)^{**}$	$(1.95)^{*}$
IdCor	−0.023	−0.049	0.013	0.015	−0.062	−0.067
	$(-6.8)^{***}$	$(-9.58)^{***}$	$(2.43)^{**}$	$(3.03)^{***}$	$(-14.69)^{***}$	$(-15.9)^{***}$
IdCor*Low_R_Q		0.042				
		$(5.84)^{***}$				
Controls						
log (GDP per capita)	Y	Y	Y	Y	Y	Y
Industry	Y	Y	Y	N	Y	N
log (Asset, USD)	Y	Y	Y	Y	Y	Y
R-squared	0.145	0.148	0.102	0.043	0.116	0.082
Number of obs	9715	9715	2005	2005	7710	7710
Number of countries	51	51	28	28	23	23

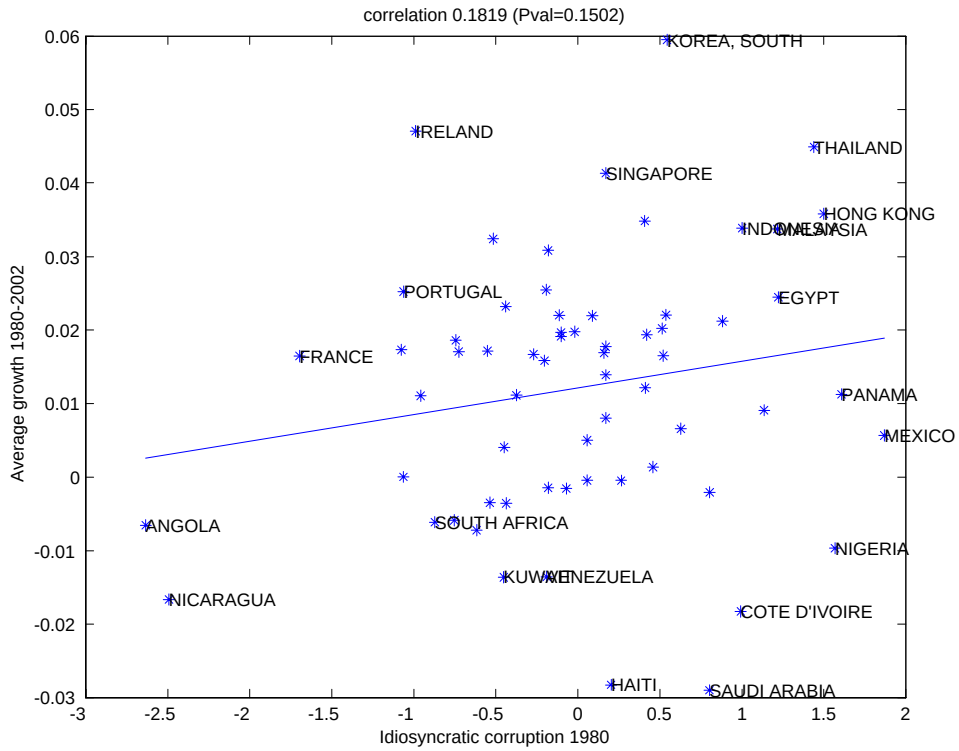
SysCor - Systematic Corruption, IdCor - Idiosyncratic corruption, SysCor and IdCor are average for 2000-2004. All t-stats are calculated clustering observations by country. Countries, which have GDP per capita > $18000 considered as developed (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States). Otherwise, the country is considered as developing (Argentina, Brazil, Chile, China, Colombia, Czech Republic, Greece, Hungary, India, Indonesia, Jordan, Korea, South, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Portugal, Russia, Slovak Republic, South Africa, Sri Lanka, Thailand, Turkey, Venezuela, Zimbabwe). Low_R_Q is indicator variable for countries where Regulatory Quality in 2004 less than 1.2 Countries with high Regulatory Qualities are: Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, Germany, Hong Kong, Hungary, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, United Kingdom, United States. The rest is considered as countries with low R_Q, Industry is dummy for first two digits of SiC code.

D Appendix

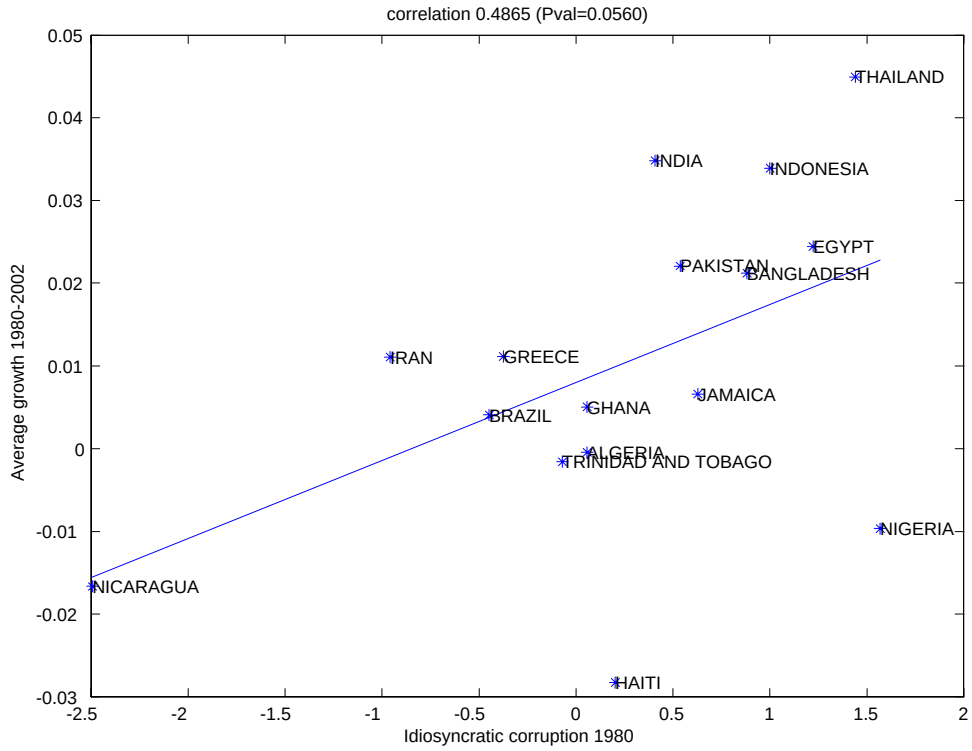
Mauro corruption data. Idiosyncratic corruption in 1980 and average GDP per capita growth 1980-2002 (1980-1989 for Iraq). All countries.



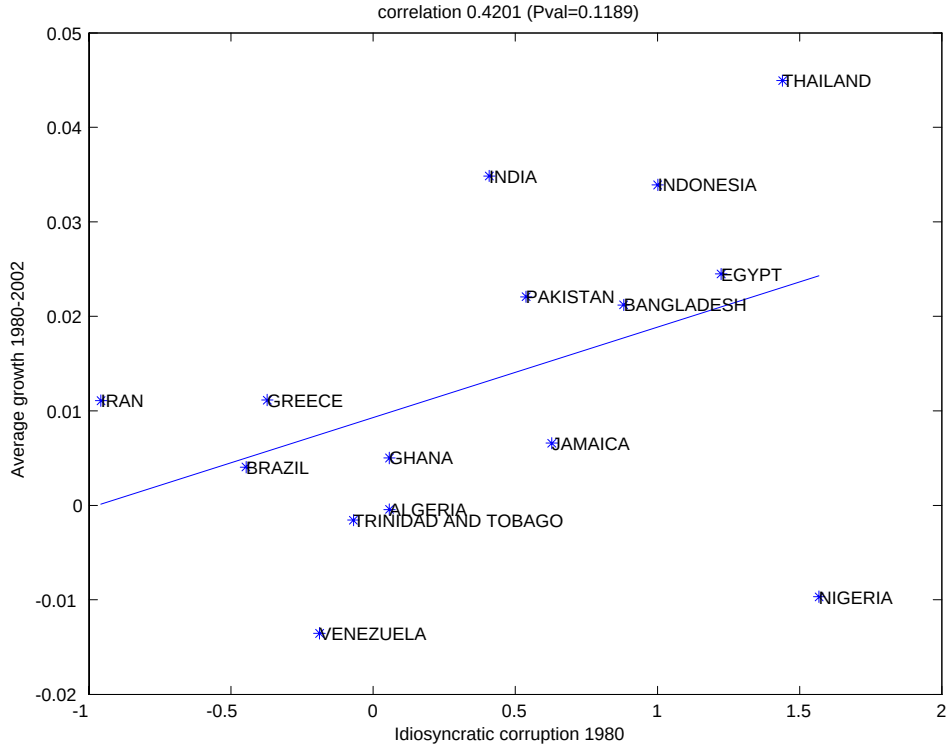
All countries without Liberia and Iraq:



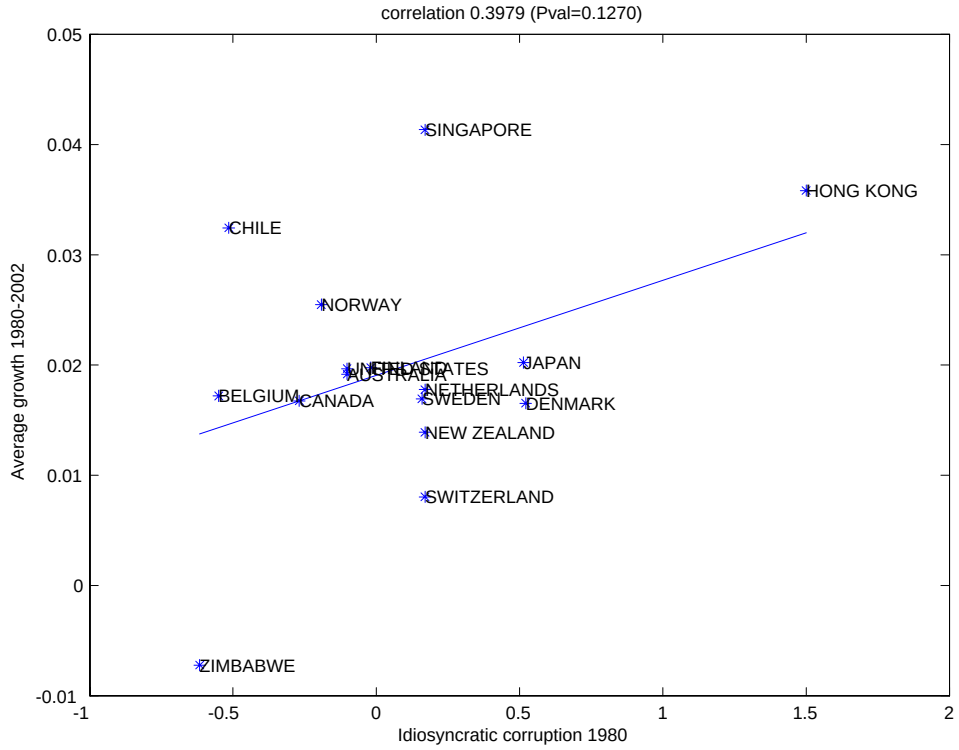
Mauro corruption data. Bottom quartile of countries sorted by Red Tape:



Mauro corruption data. Bottom quartile of countries sorted by Red Tape, without Nicaragua and Haiti:



Mauro corruption data. Top quartile of countries sorted by Red Tape:



Mauro corruption data. Top quartile of countries sorted by Red Tape, without Singapore, Hong Kong, Chile and Zimbabwe:

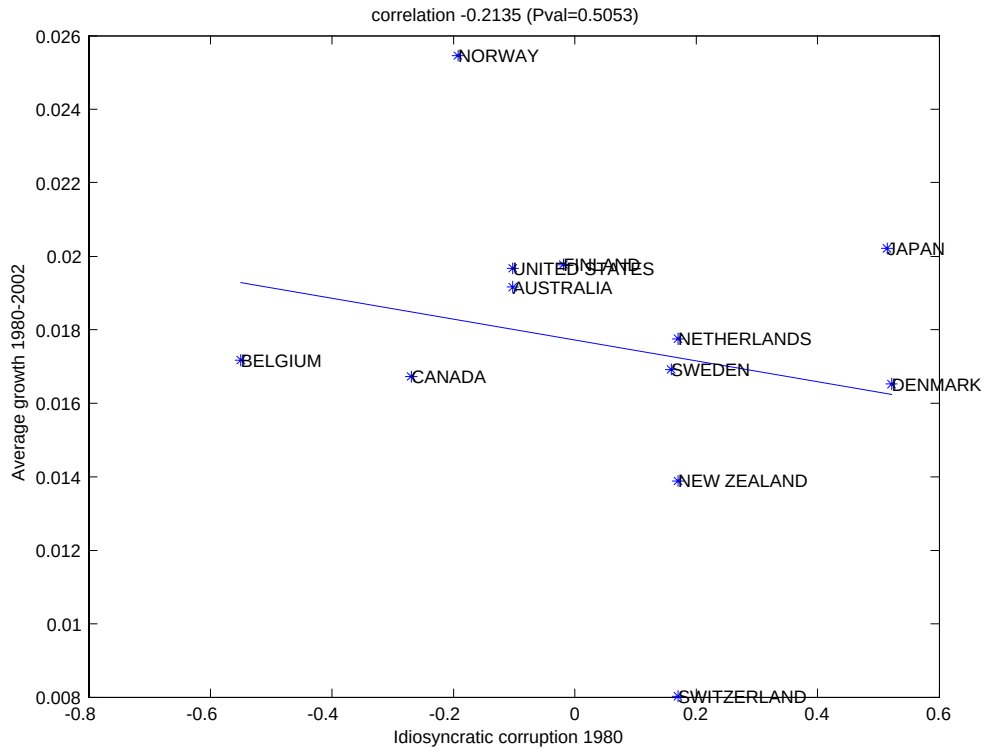


Table 8

Dependent variable: average GDP growth 1980-2002				
Independent	Explanatory variables: Mauro (1995)			
Variable	(1)	(2)	(3)	(4)
Constant	0.012	0.012	0.012	0.011
	$(5.48)^{***}$	$(5.59)^{***}$	$(5.51)^{***}$	$(5.35)^{***}$
SysCor	-0.005	-0.005	-0.005	-0.005
	$(-2.26)^{**}$	$(-2.36)^{**}$	$(-2.39)^{**}$	$(-2.61)^{***}$
IdCor		0.004		
		(1.51)		
IdCor*H1			0.004	
			(1.54)	
IdCor*H2			0.002	
			(0.51)	
IdCor*Q1				0.010
				$(2.29)^{**}$
IdCor*Q2				-0.001
				(-0.2)
IdCor*Q3				0.000
				(0.09)
IdCor*Q4				0.007
				(1.36)
R-squared	0.077	0.11	0.112	0.166
Number of countries	64	64	64	64

SysCor - Systematic Corruption (linear combination of Efficiency of Judiciary System and Red Tape, taken from Mauro (1995), initial source is country risk indicators for 1980-1993) published by Business International) , IdCor - Idiosyncratic corruption divided , calculated as described in section Data and construction of variables. SysCor and IdCor are divided by 2.2 and 6.67 respectively, in order to get the same standard deviation of variables as before for similar variables, H1 is indicator for bottom half of countries sorted by Red Tape, H2 - indicator for top half, Q1-Q4 are indicators for 1st - 4th quartiles, sorted by Red Tape. All t-stats are White corrected.

E Appendix

Proof of Proposition 1.

If we differentiate (2) with respect to F (if γ^* is internal solution) we get the following:

$$\frac{\partial SW}{\partial F} = -p\left(\gamma^*\right)\left(N_G + N_B\right) - \frac{\partial \gamma^*}{\partial F} N_G D$$

Since γ^* does not depend on N_B and $p\left(\gamma^*\right) > 0$ it is obvious why $\frac{\partial^2 SW}{\partial F \partial N_B} < 0$, or $\frac{\partial SW}{\partial F}$ decreases in N_B.

If we do not observe F and observe γ^*, then $\frac{\partial SW}{\partial \gamma^*} = \frac{\partial F}{\partial \gamma^*}\frac{\partial SW}{\partial F}$. From equation (1) and using $p'' > 0$ we can easily get $\frac{\partial \gamma^*}{\partial F} = -\frac{C}{F^2 p''(\gamma^*)} < 0$, and $\frac{\partial F}{\partial \gamma^*} = -\frac{F^2 p''(\gamma^*)}{C} < 0$. Therefore $\frac{\partial SW}{\partial \gamma^*}$ increases in N_B.

QED.

Proof of Proposition 2.

Let's analyze the case $N_B \leq N_G\left(\frac{D}{C} - 1\right)$. We can easily show that setting $F = \infty$, we can achieve Second Best:

$$SW = K - C\left(1 - \gamma\right)\left(N_G + N_B\right) - Fp\left(\gamma\right)\left(N_G + N_B\right) - \gamma N_G D \longrightarrow \max_{\gamma, F}$$

$$\frac{\partial SW}{\partial \gamma}|_{\gamma=0} = C\left(N_G + N_B\right) - Fp'\left(0\right)\left(N_G + N_B\right) - N_G D < 0$$

for all $F > 0$ if $N_B \leq N_G\left(\frac{D}{C} - 1\right)$. Therefore Second Best in that case is $\gamma^* = 0$. We can achieve it by setting $F = \infty$.

If $N_B > N_G\left(\frac{D}{C} - 1\right)$ then Second Best is $F^* = 0$ and $\gamma^* = 1$,because for $F = 0$

$$\frac{\partial SW}{\partial \gamma} = C\left(N_G + N_B\right) - N_G D > 0$$

for all $\gamma > 0$.Therefore we can achieve Second Best by setting $F = 0$.

F Appendix. Outliers

In this section, I briefly analyze the outliers. The first outlier, which I exclude from both sets of regressions, is Liberia. Liberia has one of the highest relative corruption indexes in 1980, but witnessed severe economic decline from 1980 to 2002 (on average, more than 6% decline each year). For 1996 to 2003 the situation is exactly the opposite: it has one of the lowest relative corruption indexes (close to Finland and Sweden) and huge economic growth (around 11% on average). This huge economic growth is driven solely by more than 50% growth in 1997. Liberia had almost $700 GDP per capita (constant 2000 US$) in 1960 and $122 in 2003, an almost 6 fold decline in 40 years. Therefore if we take into account corruption index in 1980, this outlier works completely against the proposed theory: it has a high relative corruption index but a significant decline in GDP. However, if we use

the average corruption index for 1996-2004, this outliers fits the theory perfectly: it has very low levels of corruption, which, combined with poor institutions causes a decline in GDP. Moreover, Liberia experienced 14 year civil war which ended in 2003. Therefore, I think it is reasonable to exclude this country from analysis.

Another interesting outlier is Iraq. The World Bank has data for the Iraqi economy only until 1991. Even if we exclude the worst years, 1990 and 1991, Iraq witnessed 11% annual decline in GDP in the period 1980-1989. This decline can only be partially explained by declining oil prices, since other countries with large oil exports did suffer such declines in GDP. For example, Kuwait experienced roughly 3.5% average decline in this period and Saudi Arabia experienced roughly 5.7% average decline. Even if we exclude the part of the decline which is explained by the fall in oil prices, we are left with roughly 5% "net" decline. According to Mauro data, Iraq in 1980-1983 had quite low level of Efficiency of Judiciary System, 6, very inefficient bureaucracy (Red Tape = 3), and the lowest possible level of corruption (Corruption =10), lower than Germany (9.5), Finland (9.5), Sweden (9.25), and Belgium (9.75). I excluded this outlier from the regressions since it makes coefficient for bottom quartile or half significant at 1% level for all possible specifications. However, it works in accordance with the tested hypothesis: absence of corruption and rigid regulation has a destructive effect on development.

Nicaragua and Haiti (which were included in all presented regressions) might be considered outliers if we analyze Mauro corruption data. However, exclusion of these two observations does not change estimation of coefficient for IdCor*Q1 significantly.

Finally, I would like to talk about Zimbabwe and Hong Kong (which were also included in all regressions). These two countries are in top quartile of countries, according to the Mauro data, however, they behave like countries with poor quality institutions: Hong Kong has the highest level of relative corruption among countries with good institutions and has the second highest economic growth (after Singapore); Zimbabwe has the lowest level of relative corruption and the lowest level of economic growth (an average decline of .8% per year for 1980-2002). Excluding these two countries drastically changes estimates of IdCor*Q4: these move from 0.007 to -0.018 and become significant at almost the 1% level. Exclusion of Zimbabwe can be justified by the fact that Zimbabwe moves from the top quartile in 1980-1983 to the bottom quintile in 1996-2004. Therefore, it is reasonable to treat Zimbabwe as a country with poor institutions rather than a country with good institutions. If so, the economic development of Zimbabwe is in accordance with the proposed theory.

The only outlier which completely goes against the theoretical predictions made above is Hong Kong. HK has both high quality institutions and a high level of relative corruption in 1980-1983, but

high economic growth in 1980-2002. After joining China, Hong Kong reduced its relative corruption level to almost zero (even to -.17, see Appendix A). It is interesting to see how this will affect future economic growth there.