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The cross-country pattern of corruption: economics, culture and the seesaw dynamics

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Abstract

This paper investigates and explains the cross-country pattern in the 1999 corruption index from Transparency International. The economic part of the model has four variables: the level and growth of real income per capita, the inflation rate, and the economic freedom index. The economic transition from poor to rich strongly reduces corruption, while periods of high inflation increase corruption. The cultural part of the model uses a set of dummies for "cultural areas", and the Gastil index for democracy. Both parts offer satisfactory explanations and interact. However, the (relative) difference between GDP levels within the same cultural area is smaller than the (relative) difference between levels of corruption. The interaction therefore points to something different from culture: the inherent seesaw dynamics of corruption.

JEL classification: K49; O11; P50
Keywords: Corruption; Economic transition; Dynamics of cross sections

1. Introduction

Casual observation and historical reading suggest that corruption varies greatly across countries and over time, even when changes are slow. Most observers probably suspect that the grand pattern of corruption is related to the grand transition[1] from a poor,

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[1] Today, the word "transition" is now often used to indicate the transition from socialism to a market economy. It used to mean the transition from poor/traditional to rich/modern. In this article, it is used in the old sense. To prevent confusion, the term "grand" is added to "transition".

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stagnating traditional society to a rich, modern, market democracy; however, it has often been suggested that a cultural factor is also involved.

Historians such as Hofstaedter (1948) claim that corruption in the US grew to reach a peak about a century ago. Since then, it has fallen steadily, as predicted by the transition hypothesis. Many knowledgeable observers have the impression that corruption in Russia has gone from bad to worse during the last decade, where the economy went through a collapse and a chaotic system change (see Levin and Satarov, 2000). Perhaps, economic chaos causes corruption.

The literature on corruption has been largely theoretical and consists of generalization based on cases. It uses different approaches. Till 1988, everything is covered by the 1000-page handbook by Heidenheimer et al. (1989), while more recent surveys are by Bardham (1997), Mbaku (1998), Lambdorff (1998) and Jain (2001). The law and economics approach is used by Rose-Ackerman (1978, 1999), while Klitgaard (1988) uses a management approach.[2]

Cross-country corruption data have recently become available, and a handful of studies starting with Mauro (1995, 1997) analyze the cross-country pattern. The purpose of Mauro's two studies is to use corruption data to explain the cross-country pattern in the investment rate. He finds that corruption has a clear, but small negative effect. Only two prior studies attempt to explain the cross-country pattern in corruption (see Husted, 1999; Treisman, 2000[3]). Their findings will be reported as we go along.

Casual observation and the literature suggest that the grand cross-country pattern of corruption should be explained by a *mixed economic–cultural model*. Also, many explanatory hypotheses have been suggested. Some of these hypotheses can be operationalized as testable hypotheses about the grand pattern. Below, *seven* such hypotheses are studied graphically and by means of a simple exploratory model. It is shown that some of these hypotheses explain most of the grand pattern of corruption.

Section 2 introduces the data, the causal structure and the economic–cultural model. Section 3 discusses the economic submodel, which contains five hypotheses about the grand pattern. Section 4 considers the cultural submodel and the last two hypotheses. Section 5 joins the two parts together. Section 6 is more speculative and discusses dynamic interactions between the hypotheses. Finally, Section 7 summarizes the findings.

2. Corruption data and analytical framework

Cross-country studies of corruption are new, so the data will be introduced in Section 2.1. How the analysis fits into the grand transition is briefly touched upon in Section 2.2, and an exploratory model is presented in Section 2.3. The model is easy to expand and develop in many directions, but I want to cover the basics.

[2] Other studies include Schleifer and Vishny (1993, 1999), Heywood (1997), Elliot (1997) and Jain (1998).

[3] See also Gupta et al. (2001). The only partly overlapping study is Treisman (2000), which was made independently of mine and published while mine was under refereeing. A short version of the present study was published in Russian before Treisman. See Levin and Paldam (2000).

2.1. The corruption variable: the κ-index for 100 countries

The best cross-country corruption data are the κ-index of *perceptions of corruption* published by "Transparency International" (see Netsources). It is a *composite index* calculated from 17 *primary indices*. Most of the primary indices are based on polls of business people operating in more countries, but some are more broad-based polls, using the same questionnaire in more countries. The primary indices are first converted to a common scale. The κ-index is the average of the scaled primary indices, and the standard deviation is also posted. The scale goes from 0 "highly corrupt" to 10 "highly clean". Therefore, when corruption goes up, the κ-index falls, and vice versa. The first κ-index from 1995 covered 41 countries. The 1999 issue increases the total covered to 100 countries.[4]

Several definitions exist of the concept of corruption. The κ-index defines corruption implicitly as an average of the definitions used by the primary indices. Fortunately, most people agree in practice on something like: "Corruption is illegal private gains made by an agent at the expense of the principal, when the agent deals with a third party".

The κ-index has *no meaningful dynamic dimension* (yet) for two reasons.[5] First, the measures contain much inertia. A respondent giving an impression of the level of corruption in a country bases the answers on own experience and stories he or she has heard. These impressions are not necessarily limited to the calendar year, but are probably formed during a longer period. Secondly, the annual movements in the κ-index implied by most of my calculations are less than 0.1 points. With strong inertia and small annual movements in the series, tests of the dynamic structure (including causality) become very weak.

The construction and the problems of the index are discussed in several papers available from the Internet sites of Transparency International (see Netsources) and also Lambdorff (1998). No doubt, the κ-index can (and will) be improved. However, the scores for the countries with which I am familiar appear reasonable. Clearly, a serious effort has been made. The standard deviation (of κ) is around 1 for most countries.[6] It is large relative to some country differences one would like to discuss, but small relative to the cross-country pattern analyzed.

2.2. Isolating a tractable part of the grand pattern

Fig. 1 shows how corruption is likely to fit into a greater causal pattern. It is complex and involves the grand transition, which normally lasts centuries and causes deep and complex changes in all aspects of society. Some of the most well-known changes are listed in Table 1. The hypothesis that corruption is *one* element of the grand transition is included as well.

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[4] The 1999 issue is used except for Bangladesh, where only the data for 1996 is available. The present article was first done on the 86 observations of the κ-index for 1998. The results were the same, though slightly weaker.

[5] The data contains mini-time series of two to five annual observations for 86 countries. Trends appear in the data for 14 countries and a pattern may be emerging. It will take a decade before formal tests of the causal direction and the dynamics can be made. Some of the primary indices cover more than 10 years, but they have other problems.

[6] In average, the κ-index is calculated from five primary indices. The standard error is thus $1 \times 5^{-1/2} = 0.4$. That means that if two countries are 1 point apart in corruption, it is just about significant.

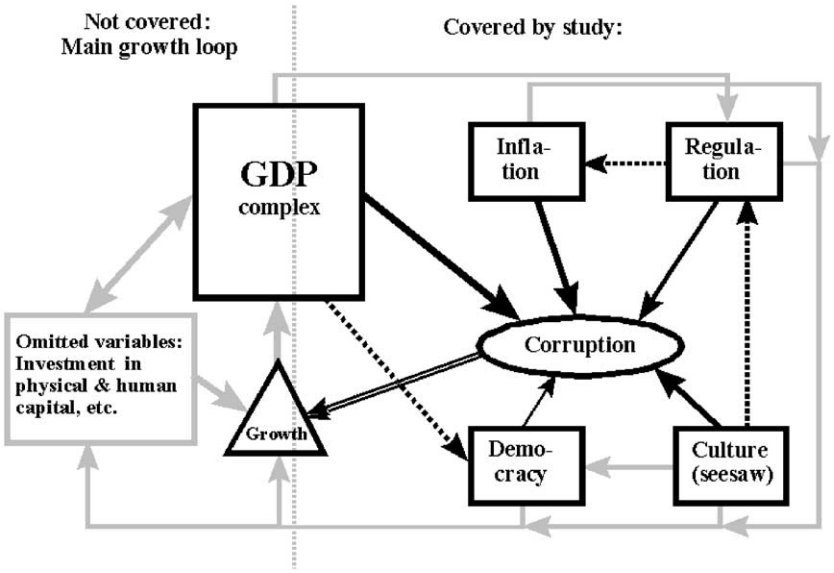

Fig. 1. The causal structure assumed and some omitted parts of the structure. The grey arrows and the grey box are not discussed, while everything in black is included. The unbroken black arrows are estimated. Their widths indicate the importance found. Broken arrows point to relations found, but not estimated. The shaded arrow from corruption to growth is estimated the wrong way, but found to be weak.

The corruption transition is a *small* part of a very big process only. So, the dog-tail analogy applies: It must be the dog that wags the tail, not the other way. Therefore, the main direction of causality is from the big aggregate (GDP) to corruption, as drawn by the big black arrow in Fig. 1. The causality the other way is seen as one or more feedback loops.

The main feedback loop is the "growth loop" via the first difference variable, drawn as the growth-triangle in Fig. 1. The literature starting with Mauro (1995, 1997) suggest that there is a small, but significant connection from corruption to investment to growth and then on to the GDP level. The tests below show this connection to be weak, so it has been disregarded in most of the analysis. There may still be more refined causal loops as drawn by the "outer" grey arrows at the figure. My assessment is that they are secondary effects of a more long-run nature.

Table 1
Four parts of the grand transition (the last is new)

	Stable traditional	LDCs in transition	Stable modern DC
Economic	Poor, stagnating	High, unstable growth	Rich, moderate growth
	Large primary sector	Industrial sector share grows	Small primary sector
Demographic	High birth and mortality rates	Mortality rate down and then birth rate	Both rates low
Political	Traditional: hereditary and theocratic systems	Unstable: often one-party or military, but also periods with democracy	Democracy
Corruption	Traditional, sometimes low	High	Low

This all leads to a clear and tractable main structure of causality. The economic theory says that corruption is an endogenous product of economic factors, though perhaps with some feedback loops, which are fortunately weak. The cultural theory sees corruption as a product of culture and politics. In this theory, corruption is exogenous to the economy.

2.3. The corruption function: an exploratory tool

The main statistical tool is therefore a one-equation corruption function of the following type:

$$\kappa_i = c + [a_1 x_{1i} + a_2 x_{2i} + \ldots]_e + [b_1 C_{1i} + b_2 C_{2i} + \ldots]_c + u_i \quad (1)$$

Here i is a country index, u is the residuals, c, a_1,. . ., b_1,. . . are coefficients to be estimated. The $[]_e$-bracket contains economic variables (x_{1i},. . .), while the $[]_c$-bracket holds cultural and political variables (C_{1i},. . .).

Eq. (1) is a reduced form of a more complex system. I have looked for signs that a simultaneous system is necessary as will be explained, but no compelling reasons were found to depart from the simple formulation. Model (1) is easy to work with, and many series are available on a comparative basis, so four families of experiments around Eq. (1) have been made:

- E1 Different x's and C's. The main experiments made will be presented to assess the robustness of the effects analyzed.[7]
- E2 Nonlinearity. Some graphs and many of the tests suggest that the economic submodel is nonlinear (see Section 3.7). However, when the cultural part is added, nonlinearity disappears.
- E3 Time-periods. Corruption changes slowly. The explanatory variables must therefore have longer time units than a year. They have consequently been averaged over 3, 5, 10 and 15 years. These averages produce much the same results, but a pattern is found. Only the best results are given.
- E4 Simultaneity. The best economic model was examined by running a set of two-stage instrumental variable regressions.[8] They pointed to little simultaneity, and will not be presented.

3. The economic submodel: $[]_e = a_1 y_i + a_2 g_i + a_3 p_i + a_4 \phi_i$

Each economic variable included corresponds to a corruption hypothesis discussed in one section: (Section 3.1) The GDP level, y, and the transition hypothesis. (Section 3.2) The growth rate, g, and the hypothesis that honesty is a factor of production. (Section 3.3)

[7] The article studies the effect of 5 quantitative variables and 6 binary dummies on corruption, and Paldam (2001) adds a further 12 variables. Altogether, 200 variants of the model have been estimated. This allows us to examine the relations as proposed by Levine and Renelt (1992), but robustness is only discussed informally.

[8] The key coefficients are checked by TSIV estimates for different instruments. For the unstable coefficients, the results depended much on the instruments, but the robust coefficients (to y and p) changed very little, and their t-ratio dropped only by 25–30%, so they remained very significant.

The inflations rate, p, and the demoralization hypothesis. (Section 3.4) The regulation index, φ, and the potential for rent seeking hypothesis. In addition, Section 3.5 considers the effect of the income distribution. (Sections 3.6 and 3.7) give estimates of the relations suggested. The data are shown in four figures using a system of markers referring to *cultural* areas. They are defined in the note to Fig. 2 and discussed in Section 4, where the actual countries are listed in Table 5.

3.1. The GDP level (y) and the transition hypothesis for corruption

Fig. 2 and reg 1 in Table 2[9] analyze the (y, κ)-relation, where y is the log to GDP per capita, measured in average PPP values (the "Penn Tables") for 1994–1996.[10] As suggested in Table 1, the transition idea is a positive causal link from y to κ: $\partial\kappa/\partial y > 0$. Honesty rises with GDP.

Corruption is seen as a characteristic of poor and middle income countries. It disappears when they go through the grand transition to become high-income countries. Two additional hypotheses should be mentioned: (i) Some low-corruption traditional societies may have experienced rising corruption at the beginning of the transition. This hypothesis is confirmed in Paldam (2001) using additional data. (ii) Some very resource-rich countries became rich without going through the whole of the transition process. They are likely to keep traditional patterns of corruption, along with other traditional patterns, as casual impressions seem to indicate.

Fig. 2 shows that a strong transition exists for corruption. The relation appears almost linear, with exception of a "WE-block" of West European countries above the average line, as discussed in Section 3.7 and later. The statistical tests confirm that the relation is both significant and robust. The same result also appears in Husted (1999) and Treisman (2000).

It is easy to explain why such a relation exists. Rich countries are efficient countries, where transactions have to be fast and transparent. Corruption is an "additional" factor that makes transactions inefficient, slow and murky. This basic insight can be expressed in many ways: Seen from the demand side (the households), the transition hypothesis claims that "honesty" is "good" with a high income elasticity like democracy. Seen from the supply side (the firms), the hypothesis claims that "honesty" is a timesaving devise that becomes more necessary as countries grow rich.[11]

The graph and the estimates below show that the grand transition changes the corruption level of the average country from about 2 to 9 κ-points—that is by 7 points. It normally takes a couple of centuries to go through the economic transition. Annual changes are consequently well below 0.1 κ-point per year. Fast transitions of the "Asian Miracle" type still take half a century, so it does not cause a fall by more than 0.2 κ-points per year.

[9] Tables 2–4 and 6–8 report 29 regressions, named reg 1 to reg 29.

[10] The official GDP data were also tried. As usual, the picture is similar, but the PPP data show a clearer pattern. For three countries, the GDP data were so weak that rather crude assessments had to be made: Albania was taken to be at 75% of Macedonia, while Croatia was put at 75% of Slovenia and Yugoslavia at 75% of Croatia.

[11] The reverse relation, where corruption increases growth and wealth, by allowing business to get round bad regulation, is also found in the literature (see Neff, 1964). It is dominated by the transition hypothesis.

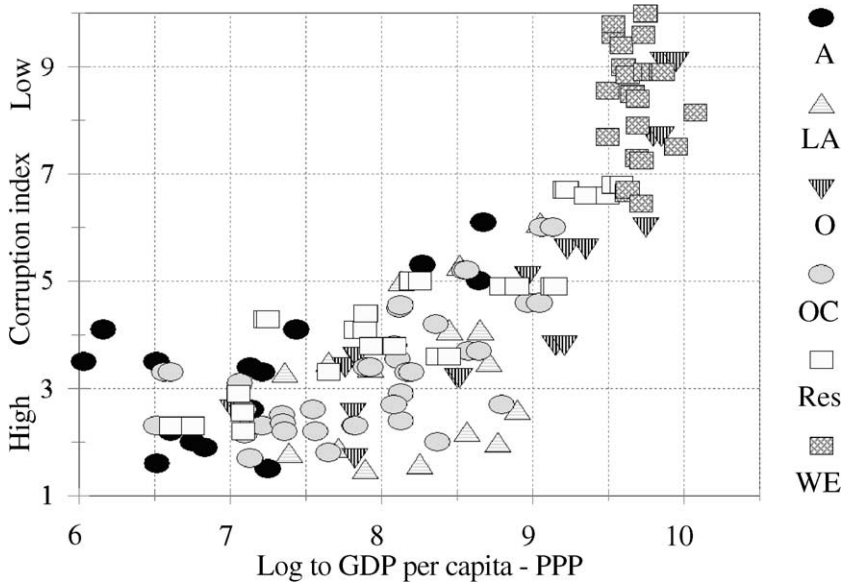

Fig. 2. Corruption and the level of GDP per capita (average 1994–1996 PPP method). Sources: IBRD Data (World Development Indicators CD-Rom). The markers are used for cultural areas as discussed in Section 4. They are: A is Africa, LA is Latin America, O is Oriental, OC is Old Communist, WE is West European and Res is the residual group. The countries in each group are listed in Table 5.

3.2. The real growth rate (g) and the hypothesis that honesty is a production factor

The supply side idea just mentioned suggests that honesty is a factor of production increasing the growth rate, g. The production factor hypothesis suggests a positive link from κ to g: $\partial g/\partial \kappa > 0$. Fig. 3 and reg 2 (and 2b) in Table 2 show the growth rate for GDP per capita, g, at the horizontal axis.[12] A positive connection (κ increases when g does) appears, though it is (much) less strong than the relation in Fig. 2, and the ones in Figs. 4 and 5 below.

This link has the reverse causality of the one assumed by Eq. (1). The κ-index for 1999 may cover impressions for 1994–1999. They should be compared with growth rates for 2000–2005. This is not possible, but regression reg 2b in Table 2 compares the κ-index for 1994–1995 with growth rates 1996–1998 for the countries where the κ-index is available. The figure and the two regressions show that the relation from κ to g is weak and fragile.[13] To make the analysis as simple as possible, the one-equation exploratory framework has been used. So there might be a small counter causality bias. To control for that bias, g is used as a right-hand variable, as is further discussed below.

[12] The data are based on IBRD World Data, but gaps for 1998 and 1997 have been filled from IMF–IFS, the internet sites of the regional development banks, and the UN–ECE. The same process is followed for the inflation series.

[13] As already mentioned, the literature (see Mauro, 1995; Borner et al., 1995; IBRD, 1997; Borner and Paldam, 1998) show a (weak) link from corruption to investments, and a strong link from investments to growth.

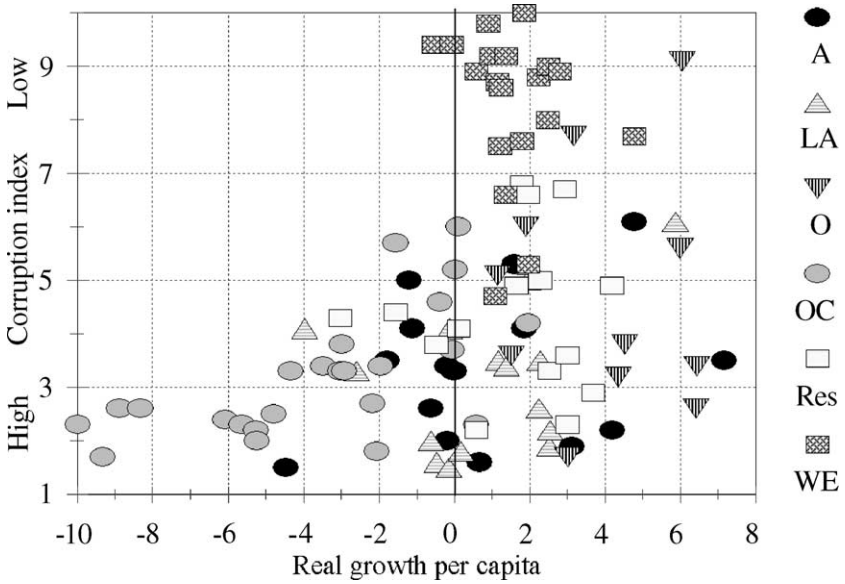

Fig. 3. Corruption and the real per capita growth rate (1989–1998).

3.3. The inflation rate (p) and the demoralization hypothesis

Corruption is mostly in the public sector. It is thus related to "public morale", i.e., confidence in and respect for authorities. Economic chaos occurs when economic policies fail. This typically causes people to loose faith in authorities.[14] Consequently, the more chaotic the economy is, the lower the κ-index should be. The best indication that things are amiss is probably high inflation. The rate of inflation, p, is therefore used as a proxy for economic chaos. One aspect of high inflation is that it causes large and seemingly arbitrary redistributions of wealth. This is likely to cause a further drop in "public morale". The chaos hypothesis is thus a negative connection from p to κ, $\partial\kappa/\partial p < 0$.

Fig. 4 shows a clear connection between corruption and inflation, measured as the logarithm of average annual inflation (CPI, 1994–1998).[15] As inflation rises, so does corruption. This connection (which has not been previously analyzed) will be shown to be fairly robust. The time horizons and magnitudes implied can be found from Fig. 4 and the estimates below show that an increase by 10 (100) times in the inflation rate increases corruption about 1.5 (3.0) points. The rise happens over 5 years, so the effect is large.

[14] The argument is related to the responsibility hypothesis that is the basis for Vote and Popularity functions (Nannestad and Paldam, 1997). High inflation is found to cause large decreases in the popularity of governments. A strong negative relation is demonstrated to exist between corruption and *generalized trust* (as defined in the World Value Survey) in Paldam and Svendsen (2001).

[15] The observation from Yugoslavia was truncated at log $p = 10$, as it gave a dominating residual.

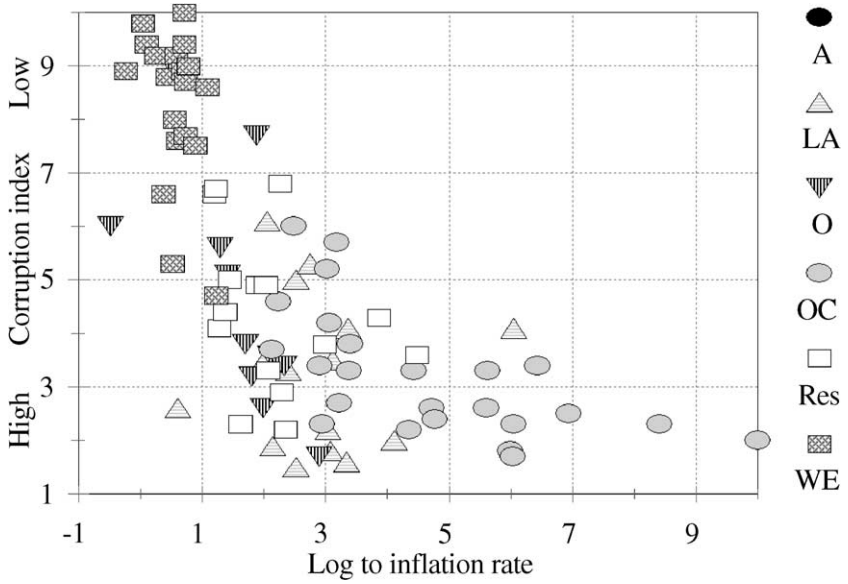

Fig. 4. Corruption and the inflation rate (1994–1998).

3.4. The economic freedom index (ϕ) and the hypothesis of the potential for rent seeking

A major part of corruption is the illegal part of rent seeking (see Mbaku, 1998). Some institutions are known to have a higher potential for rent seeking than others. Consequently, a hypothesis is that the higher the corruption, the higher the institutional potential for rent seeking in a country. However, the introduction mentions the reverse idea. The example of Russia suggested that deregulation may cause corruption to increase.

An ambitious attempt to measure the amount of regulation in the economy is the κ-index of *economic freedom* (see Netsources), which gives special emphasis on arbitrary regulation. It is used as a measure of the potential for rent seeking. The index is scaled in reverse direction from the one discussed: Heavily regulated countries are given low scores and vice versa. The κ-index has been compiled for 86 of the same countries as the κ-index.[16]

The two competing hypotheses are: The rent seeking hypothesis predicts that much regulation (ϕ high) cause high corruption (κ low): $\partial\kappa/\partial\phi>0$. The reverse (Russian) hypothesis that deregulation (ϕ high) may cause an increase in corruption (κ low), so that

[16] The average for 1985, 1990, 1995 and 1997 is used. Data for 1985 and 1990 are missing for the OC countries. Inflation is a component of the economic freedom + index. To reduce the confluence, the ϕ-index was purged of the inflation. However, the regression results hardly changed. The results presented use the standard series.

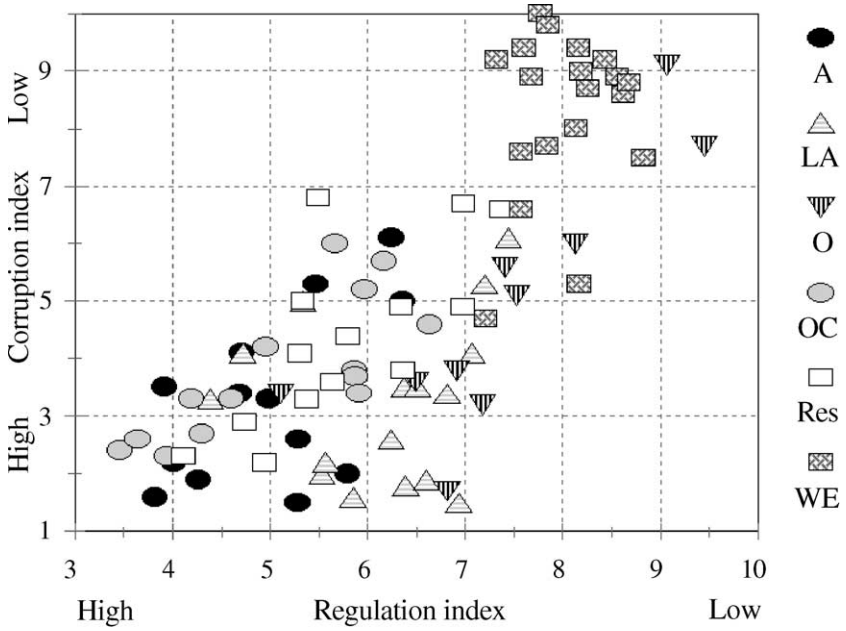

Fig. 5. Corruption and the economic freedom (regulation) index (1985–1998).

$\partial\kappa/\partial\phi < 0$. Fig. 5 and reg 4 in Table 2 show the relation between the two indices—the link is clearly positive, but the regressions below show that the connection lacks robustness.[17] The same idea is analyzed in Treisman (2000). Though the analysis is done differently, the results reached are similar.

The introduction observes that corruption in Russia has increase in the 1990s. The results suggest that the increase is caused by the economic chaos in the country, as indicated by the large waves of inflation, and not by deregulation as such.[18]

3.5. The Gini coefficient (μ) and the income skewness hypothesis

A skew income distribution may increase the temptation to make illicit gains, and thus increase corruption. A skew income distribution (high Gini, μ) should thus give high corruption (low κ), so the prediction is that $\partial\kappa/\partial\mu < 0$.

For 75 of the 100 countries, the World Bank data file includes an estimate of the Gini-coefficient. The estimates are from different years and of a poorer quality than the other

[17] A recent study (de Haan and Sturm, 2000) shows that even when the connection between the level of GDP per capita, y, and the ϕ-index is positive, the connection is not robust. However, a strong, robust connection was found between changes in ϕ and the real growth rate.

[18] Several stories from Russia actually show that corruption in certain sectors—notably in connection with the import of cars—was drastically reduced when the sector was deregulated. However, a major part of the deregulation was mass privatization. It is arguable that it was done in a way that caused a loss of confidence in the State.

Table 2
Estimates of economic model: $\kappa_i = c + a_1 y_i + a_2 g_i + a_3 p_i + a_4 \phi_i + u_i$

	Reg 1	Reg 2	Reg 2b	Reg 3	Reg 4	Reg 5	Reg 6	Reg 7
Constant	− 10.26	4.49	5.71	6.72	− 3.07	8.00	− 6.95	− 5.47
	(9.1)	(20.1)	(13.3)	(21.4)	(4.1)	(8.4)	(4.4)	(3.1)
GDP	1.79						1.46	1.54
	(13.3)						(6.2)	(6.1)
Growth		0.24	0.18				− 0.06	− 0.10
		(3.7)	(1.3)				(1.0)	(1.4)
Inflation				− 0.82			− 0.55	− 0.66
				(8.4)			(3.5)	(3.6)
Regulation					1.26		0.11	− 0.07
					(10.9)		(0.6)	(0.3)
Gini (× 10)						− 0.88		− 0.20
						(3.7)		(1.4)
N	100	100	41	100	86	75	86	69
R^2	0.64	0.12	0.04	0.42	0.59	0.16	0.75	0.79
Reset	54.0*	1.9	0.20	35.8*	8.7*	4.1(*)	15.2*	11.7*

The numbers in brackets are the *t*-ratios. An * at the reset test points to problems. Reg 2b looks at the κ-index 1994–1995 and growth 1996–1998, to catch the causality from κ to g—the sample is much smaller.

data, but nevertheless an attempt was made to see whether a connection appears. A relation is present as expected, but it is not robust, and adds little explanatory power in the multiple regressions. It has only been included in a couple of regressions in Table 2, but it is a connection that merits further study.

3.6. Estimates of the economic submodel

Tables 2 and 3 show a set of 13 regressions for the economic model. The regressions all generate significant coefficients, and, when one variable is inserted at a time, everything goes as predicted from the graphs. The GDP level (reg 1) has $R^2 = 0.64$, the regulation index (reg 4) 0.59, inflation (reg 3) 0.42, the Gini (reg 5) 0.16 and the growth rate (reg 2) only 0.12. The Gini and growth thus explain little of the variation in corruption. This is

Table 3
Estimates of variants of the economic model

	Reg 8	Reg 9	Reg 10	Reg 11	Reg 12	Reg 13
Constant	− 9.59 (8.4)	− 6.25 (4.7)	− 10.20 (7.4)	6.97 (17.7)	− 0.15 (0.1)	− 6.08 (4.5)
GDP	1.70 (12.4)	1.43 (9.9)	1.45 (5.9)			1.42 (9.8)
Growth	0.10 (2.2)			− 0.07 (1.0)		− 0.03 (0.6)
Inflation		− 0.39 (4.7)		− 0.91 (7.1)	− 0.46 (2.6)	− 0.43 (4.1)
Regulation			0.44 (2.6)		0.95 (5.9)	
N	100	100	86	100	86	100
R^2	0.66	0.71	0.71	0.42	0.62	0.71
Reset	42.4*	37.4*	24.7*	34.2*	20.3*	37.1*

See Table 2.

Table 4
Comparing the linear and two nonlinear estimations of the economic model

	Reg 6, linear	Reg 14, log (κ)	Reg 15, exp (κ)
Constant	− 6.95 (4.4)	− 6.85 (4.1)	− 5.75 (1.3)
GDP	1.46 (6.2)	1.82 (7.3)	1.04 (1.6)
Growth	− 0.06 (1.0)	− 0.01 (0.2)	− 0.31 (1.9)
Inflation	− 0.55 (3.5)	− 0.45 (2.7)	− 1.24 (3.0)
Regulation	0.11 (0.6)	− 0.05 (0.2)	0.27 (0.5)
N	86	86	86
R^2	0.75	0.74	0.37
Reset	15.2*	2.2	16.0*

Reg 6 is repeated from Table 2 for easy reference. The coefficients to Reg 14 and to Reg 15 are scaled by 5 and 0.001, respectively.

also the case in reg 2b, which attempts, as much as possible, to catch the reverse causality of the growth relation. The counter causality bias in the coefficient on the GDP level must thus be small.

Regressions 6 to 13 in Tables 2 and 3 show that the economic variables have strong collinearity. When all four are included in reg 6, the R^2-score rises by 0.11 only compared to reg 1, where the y-variable is used alone, and the coefficient on growth even changes sign.

The GDP level, y, obtains the coefficient that is most robust to the other variables. It has the bulk of the explanatory power, and it reduces the effect of the other variables. Inflation stays significant throughout, while the regulation index remains significant if either y or p is included, but not if both variables are included. The growth rate becomes mostly insignificant and very unstable. The dominating variable in the pattern is thus y.

The grand transition from a low income (y) and high corruption (low κ) to high income and low corruption is by far the strongest economic relation in the data.

3.7. The deviations from linearity

The main statistical problem with the models in Tables 2 and 3 is that the *reset tests*[19] indicate problems with the functional form. (The usual battery of tests pointed to no other problem). Especially when y is used as regressor, some extra curvature remains in the data. The curvature is visible to the naked eye in Figs. 2 and 4. It looks as if the nonlinearity is due to the WE-block of countries clustering together at the upper right-hand corner of the two graphs. This corner-observation plays a role in Section 6. Table 4 shows what happens when the κ-index is transformed—to change the curvature—before the regression is run (the coefficients are scaled to be easily comparable).

[19] The reset test is an LM test for curvature. The tables report the standard quadratic form reported by PC-Give—the econometrics package used in the regression analysis.

The pattern in the coefficients is the same in the three models of Table 4. The reset test suggests that the logarithmic form is the best. The next section removes the curvature in a way that is easier to interpret.

4. The cultural submodel: $[]_c = b_1 D_i^{WE} + b_2 D_i^{LA} + b_3 D_i^{OC} + b_4 D_i^{A} + b_5 D_i^{O} + b_6 \gamma_i$

Two culture hypotheses are considered. The first sees corruption as behavior that follows the main cultural divisions. It is sometimes termed *cultural determinism*, as corruption is taken to be so deeply embedded in certain cultures so as to be unchangeable. The second hypothesis relates corruption to democracy—strictly speaking, this is a political theory.

4.1. The Ds, dividing the world into cultural areas

"Culture" is a nebulous concept, where all operationalizations are debatable. Here I use a *cultural area approach*. An alternative is tried in Paldam (2001), using religion as the key to the cultural dimension. This is also done by Treisman (2000). A third possibility is Husted (1999) using the classification scheme of Hofstede (1984).

The cultural area approach classifies the countries into the main *cultural areas* listed in Table 5. The groups are virtually the same as reached in Huntington (1996, Chapter 1). The reader will probably see the same pattern with a few minor changes—caused by a couple of problems, such as countries with mixed population, or countries in the process of

Table 5
The cultural groups

Var	Name and description of group
D^{WE}	Nineteen Old OECD countries of **W**est **E**uropean type: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, The Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, United States.
D^{LA}	Sixteen **L**atin **A**merican countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay, Venezuela.
D^{OC}	Twenty-four **O**ld "**C**ommunist" countries—from East European to Central Asia: Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Rep, Estonia, Georgia, Hungary, Kazakhstan, Kyrgiz Rep, Latvia, Lithuania, Macedonia, Moldavia, Poland, Romania, Russia, Slovak Rep, Slovenia, Ukraine, Uzbekistan, Yugoslavia
D^{A}	Fifteen countries from South of Sahara **A**frica: Botswana, Cameroon, Ghana, Ivory Coast, Kenya, Malawi, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia, Zimbabwe
D^{O}	Eleven **O**riental countries from the "Chinese" cultural sphere: China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan[a], Thailand, Vietnam
D^{R}	**R**esidual no-group of 15 countries: Bangladesh, Egypt, Greece, India, Israel, Jamaica, Jordan, Mauritius, Mongolia, Morocco, Pakistan, Portugal, Spain, Tunisia, Turkey

Many countries have missing observations—in particular, most countries in the OC group are missing data before 1990–1991. The variables are dummies with the value 1 if a country belongs to the group, else they are 0.

[a] Data for Taiwan are from China Aktuell, Monatszeitschrift, Institut für Asienskunde, Hamburg.

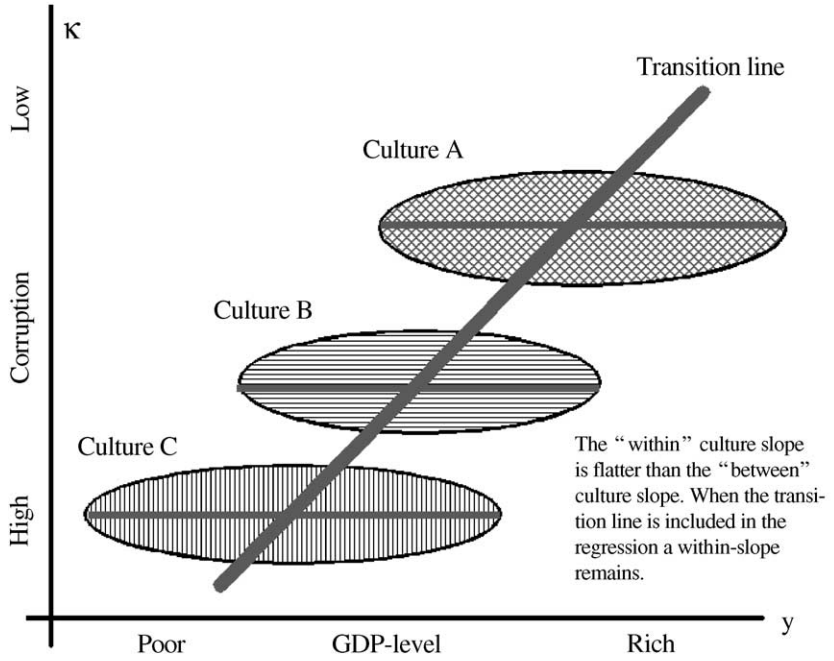

Fig. 6. The pattern of cultural clusters according to the culture theory.

changing from group to another.[20] These problems are solved by putting the difficult cases in the residual group.

The main problems are: The κ-index contains only three countries from the Indian cultural area and four countries from the Arab cultural area—they are too few to analyze separately. Some countries (as Greece, Israel, Mauritius and Mongolia) could have been included in more than one group. The WE (West Europe) group includes Australia, Canada, New Zealand and USA. Therefore, it would be logical to include Portugal and Spain in the LA (Latin American) group. However, Portugal and Spain are now more integrated in Europe than in Latin America. Consequently, Portugal and Spain were put in the residual group so as not to blur the distinction between the WE and the LA groups.[21]

4.2. Looking for clusters in the marker patterns in Fig. 2

The groups are used in the pattern scheme on the markers shown in Figs. 2–6. The reader should note that the countries of the five cultural areas cluster on most of the

[20] As a crude rule of thumb, I have used half a century as the time horizon for the cultural dummies. Countries as Greece, Israel, Portugal and Spain that has become more and more West European in the last half century, but might have belonged in another group in 1950 are takes as "problems" to be put in the residual group.

[21] Experiments were made placing Spain, Portugal and Greece in the WE group, and Spain and Portugal in the LA group. It only changed the results marginally, so the "purest" solution was preferred.

graphs, while the countries of the residual groups neither cluster nor stand out as exceptions on any of the graphs.

The most interesting marker pattern is in Fig. 2. It is obvious that the countries in the groups cluster—along both axis. From the convergence literature (see Barro, 1997), it is known that convergence occurs for similar countries, so it is no wonder that countries in the same cultural groups cluster in GDP levels (the horizontal direction). If corruption is culturally determined, this should cause countries in the same cultural group to have similar levels of corruption (the vertical direction).

As the GDP level is the key determinant of the corruption level, that should in itself cause a cluster along the vertical axis. So the cultural theory must therefore mean that countries cluster *more* along the corruption axis than along the growth axis. This prediction is drawn in Fig. 6.

However, Fig. 2 looks different from Fig. 6. The impression from looking at the figure is that the group clusters are stronger along the GDP axis than along the corruption axis, so the picture looks more as drawn in Fig. 7. It is easy to convert these arguments and impressions into a formal test.

The key point to test is thus whether there is some extra effect of the GDP level within each cultural group once the transition effect has been accounted for. This is easy to test, and is done in Section 5.2, while Section 6 interprets the result.

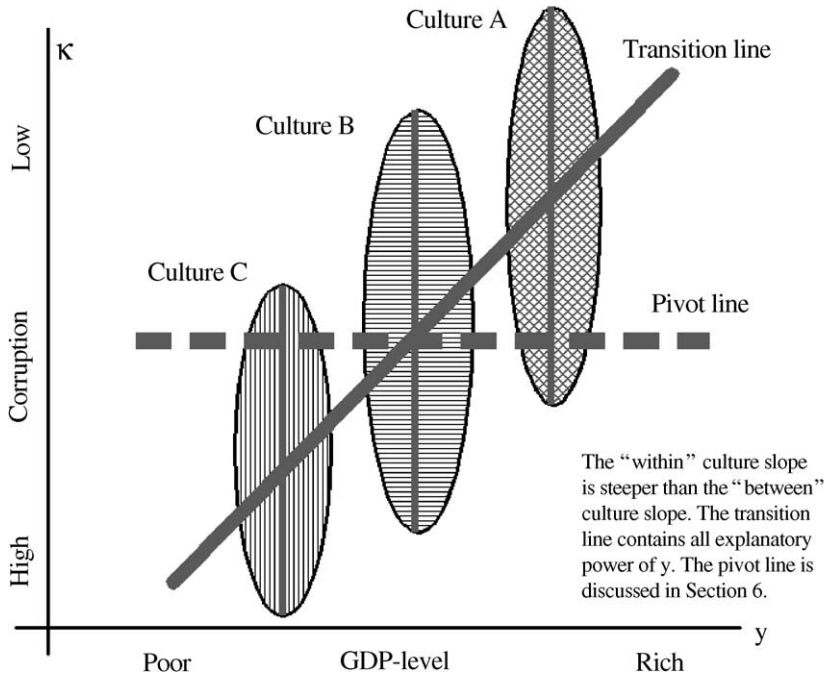

Fig. 7. The pattern of cultural clusters according to the seesaw theory of Section 6.

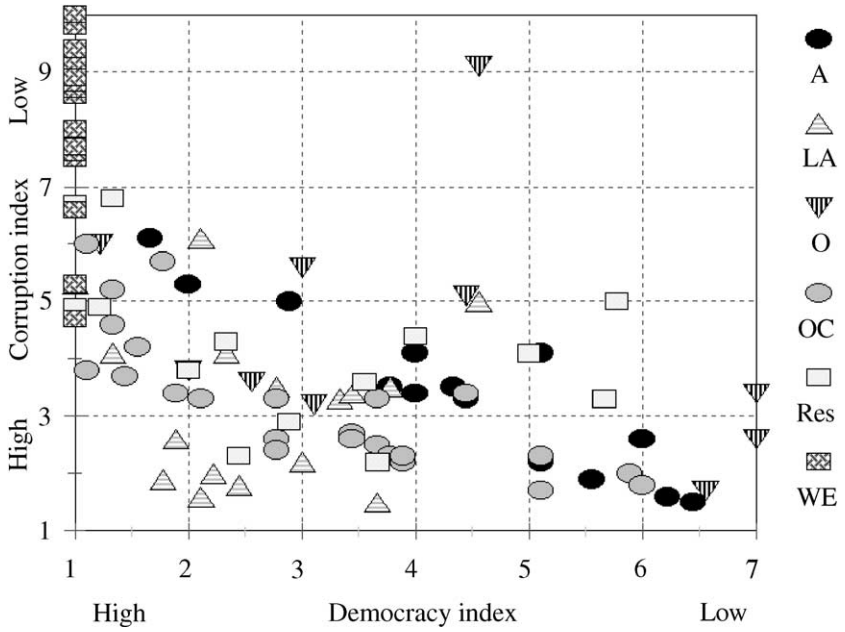

Fig. 8. Corruption and the Gastil index for Democracy (1990–1998).

4.3. The Gastil index (γ) and the "good" and the "bad" hypothesis

The relation between corruption and democracy has often been discussed, see e.g., Heywood (1997) and Rose-Ackerman (1999). The Gastil index, γ, (from Freedom House, see Netsources) for democracy is used to analyze this question. It is averaged over 15 years, and gives a number between 1 (full democracy) and 7 (no democracy) for the level of democracy of all countries included in the κ-index, except Hong Kong.

Two hypotheses have been presented about the relation between corruption and democracy. They can be characterized as a "good" and a "bad" hypothesis as they are often used in political debates with normative overtones. In particular, it appears that the most common justification used by new (military) dictators is that they had to take power to clean up the corruption of the old (democratic) regime. Most readers will probably agree that it would be bad if the relation implied generalizes.

Therefore, the *bad* hypothesis is that dictatorship (high γ's) causes low corruption (high κ's), so that $\partial\kappa/\partial\gamma>0$. The argument for the hypothesis is most systematically laid out by Wintrobe (1998). His key argument is that dictatorship concentrates the group of the corrupt, and hence reduces the amount extorted.[22]

[22] The theoretical argument is supplemented by a number of cases studies showing that many—especially among the worst—dictators are much more interested in power than in money.

The *good* hypothesis is that democracy (low γ's) causes low corruption (high κ's), so that $\partial\kappa/\partial\gamma < 0$. The argument is that democracy increases transparency, and hereby corruption is reduced. This is the very idea behind Transparency International.

Fig. 8 shows the relation between democracy (γ) and corruption (κ). The connection is clearly negative in accordance with the good theory, but the fit does not look too convincing, as most of the correlation in Fig. 8 is due to the (now familiar) NW-block at the top left-hand side of the graph.

The political transition changes stable traditional political systems to stable democracies as listed in Table 1. However, the democratic transition normally takes place late and after several false starts: many countries become democracies one time after the other until democracy finally takes roots. Here the transitions in both the κ and γ variables have led to low-corruption democracies. The basic picture may thus be due to the common factor of wealth (y), explaining *both* the κ- and γ-indices. This possibility is analyzed in Section 5.1.

4.4. Estimates of the cultural submodel

Table 6 gives the estimates of the pure culture model. Reg 16 and reg 17 are substantially the same, but the reader may find one of the two easier to understand.

The results reported for the cultural model are as good as the results for the economic model. This is seen by comparing reg 16 (in Table 6) with reg 6 (in Table 2). The two regressions have almost the same R^2. There are point is favor of both equations: It speaks for the economic model of reg 6 that it has fewer variables than reg 16, and in addition reg 16 has no policy relevant variables. It speaks for the cultural model of reg 16 that reverse causality is more unlikely in reg 16 than in reg 6, and in addition the cultural dummies remove any signs of curvature from the data.

The three most significant cultural areas are West Europe, Old Communist and Latin America. They have one positive and two negative coefficients, respectively. The pattern

Table 6
Estimates of the culture model: $\kappa_i = c + b_0 D^{R} + b_1 D_i^{WE} + b_2 D_i^{LA} + b_3 D_i^{OC} + b_4 D_i^{A} + b_5 D_i^{O} + b_6 \gamma_i$

	Reg 16	Reg 17	Reg 18	Reg 19
Constant	5.91 (14.2)		4.39 (11.5)	7.03 (20.1)
Residual group		5.91 (14.2)		
West Europe	2.90 (6.2)	8.81 (29.3)	3.89 (7.6)	
Latin America	− 1.03 (2.3)	4.88 (12.4)	− 0.90 (1.7)	
Old Communist	− 1.05 (2.6)	4.86 (12.7)	− 1.17 (2.4)	
Africa	− 0.17 (0.4)	5.74 (10.9)	− 1.05 (1.9)	
Orient	0.71 (1.4)	6.63 (12.0)	0.32 (0.6)	
Democracy	− 0.53 (5.8)	− 0.53 (5.8)		− 0.86 (8.3)
N	99	99	99	99
R^2	0.74	(0.94)	0.42	0.42
Reset	0.0	0.0	0.0	22.4 *

The dummies plus the residual culture add to 1. The residual culture or the constant must therefore be deleted. The R^2-score is calculated differently in reg 17, where the constant is "hidden" as a tie.

in the cultural area dummies will be further discussed in Section 6, after the economic model has been included.

5. The full model

When the full model is put together, two crucial questions are: (i) Which effects remain robust? And (ii) how do the two parts of the model interaction? Tables 7 and 8 show estimates of model (1) from Section 2.3. The interaction of the economic and culture terms is studied in two ways giving much the same result:

(A) Table 7 joins the two submodels and estimates $\kappa_i = c + []_e + []_c$. It allows us to study the robustness of the effects found in the two submodels.
(B) Table 8 adds multiplicative interaction between the coefficients and estimate $\kappa_i = c + []_c + y[]_c$. It allows us to estimate the within-culture slopes.

5.1. Joining the two parts of the model: The robustness analysis

Table 7 shows what happens when both submodels are joined. By far, the most powerful variable remains y, the GDP level. It is reasonably constant and significant throughout. Contrarily, the growth variable (g) remains insignificant and changes sign.

The remaining three "economic" variables, p, ϕ and γ, keep their signs, but lose significance in the mixed model. In particular, it should be noted that the coefficient on democracy is greatly reduced by GDP in reg 20. The most reasonable interpretation is that the connection between γ and κ is mainly due to confluence with GDP. It is dubious if democracy *in itself* reduces corruption.[23]

The coefficient on inflation is "knocked out" by the culture dummies. The reduction in the coefficient is mainly a consequence of the negative coefficient on the Latin American cultural dummy. Inflation is a variable that follows the "culture pattern" as much as it follows the pattern of corruption. Casual observation and studies as Blomström and Mellor (1991) and Lal and Myint (1996) show a cultural element in the choice of economic system. A country is likely to have the same economic system as other countries within its cultural area- and, as both the LA group and the OC group have shown, countries within the same cultural group are also likely to change system at the same time.[24] It is also known that some economic systems are more inflationary than others. Further, the more inflationary systems have relatively heavy regulatory policies.

[23] Treisman (2000) reaches the same conclusion.

[24] Two Import Substitution Industrialization policy regimes have dominated two of the cultural areas: "Cepalism" in Latin America from the 1930s to the 1980s, and "African Socialism" in Africa from the late 1960s to the late 1980s. While the LA group has changed system in a rather decisive way in the 1990, the African group has changed in a seemingly more haphazard way.

Table 7
Estimates of the mixed model: $\kappa_i = c + a_1 y_i + a_2 g_i + a_3 p_i + a_4 \phi_i + b_1 D_i^{WE} + b_2 D_i^{LA} + b_3 D_i^{OC} + b_4 D_i^{A} + b_5 D_i^{O} + b_6 \gamma_i$

	Reg 6	Reg 16	Reg 20	Reg 21	Reg 22	Reg 23	Reg 24
	Economic	Culture	Mixed	Variants			
Constant	− 6.95	5.91	− 7.02	− 7.06	1.47	− 4.22	− 8.08
	(4.4)	(14.2)	(3.1)	(4.2)	(0.9)	(2.4)	(4.6)
GDP level	1.46		1.31	1.19		1.14	1.56
	(6.2)		(4.7)	(5.0)		(5.7)	(8.6)
Growth	− 0.06		0.05	0.06	0.08		
	(1.0)		(0.8)	(1.0)	(1.1)		
Inflation	− 0.55		− 0.18	− 0.15	− 0.13		
	(3.5)		(1.1)	(0.9)	(0.7)		
Regulation	0.11		0.19	0.33	0.66		
	(0.6)		(1.0)	(1.7)	(3.3)		
West Europe		2.90	1.13	1.16	1.71	1.69	
		(6.2)	(2.2)	(2.2)	(3.0)	(2.8)	
Latin America		− 1.03	− 0.89	− 0.93	− 1.09	− 1.09	
		(2.3)	(2.1)	(2.2)	(2.3)	(2.8)	
Old Communist		− 1.05	− 0.06	0.09	0.12	− 0.81	
		(2.6)	(0.1)	(0.2)	(0.2)	(2.3)	
Africa		− 0.19	0.45	0.36	0.03	0.43	
		(0.4)	(1.0)	(0.8)	(0.1)	(1.0)	
Orient		0.71	− 0.96	− 1.01	− 0.70	− 0.21	
		(1.4)	(1.7)	(2.0)	(1.1)	(0.4)	
Democracy		− 0.53	− 0.05		− 0.27	− 0.22	− 0.21
		(5.8)	(0.4)		(2.2)	(2.3)	(1.9)
N	86	99	85	86	85	99	99
R^2	0.75	0.74	0.82	0.82	0.77	0.81	0.67
Reset	15.2 *	0.0	1.4	4.2(*)	2.8	0.6	44.6 *

It follows that governments in some cultures have chosen regulatory policy regimes that make them both more inflationary and more corrupt. They become more corrupt, as the regime has (i) a greater rent seeking potential, and (ii) as the regime generates more inflation they become more corrupt.

5.2. Comparing the within-culture slopes and the between-culture slope

Table 8 shows five regressions. The crucial question is—as discussed in Section 4.2—whether a within-culture slope that differs from the transition slope can be identified.

Compare first regs 25 and 26. The estimates in reg 25 of the five separate slopes for the countries in each group are: − 0.35 (WE, 19), 1.21 (LA, 16), 0.98 (OC, 24), 1.12 (A, 15) and 1.96 (O, 11), where the numbers in the brackets refer to the number of countries in the group. The slope for the WE countries is insignificant, as it is estimated on data with very little variation on the GDP axis. The average within-group slope is 0.98, or 1.31 without the insignificant WE group. This is the same as 1.33, the coefficient on y (in reg 26). Therefore, it comes as no surprise that when y and p are included in regs 27 and 29, *none*

Table 8
Controlling for multiplicative interaction $\kappa_i = c + a_1 y_i + a_2 p_i + b_1 D_i^{WE} + b_2 D_i^{LA} + b_3 D_i^{OC} + b_4 D_i^{A} + b_5 D_i^{O} + d_1 y_i D_i^{WE} + d_2 y_i D_i^{LA} + d_3 y_i D_i^{OC} + d_4 y_i D_i^{A} + d_5 y_i D_i^{O}$

		Reg 25	Reg 26	Reg 27	Reg 28	Reg 29
	Constant	4.39 (13.6)	− 6.41 (4.7)	− 7.31 (2.7)	− 4.99 (4.5)	− 6.33 (2.4)
GDP level	y		1.33 (8.1)	1.44 (4.4)	1.22 (7.4)	1.38 (4.3)
Inflation	p				− 0.24 (2.6)	− 0.25 (2.6)
Culture area	D^{WE}	7.24 (0.4)	1.81 (3.9)	18.94 (1.1)	1.60 (3.4)	18.95 (1.1)
Dummies	D^{LA}	− 10.85 (2.2)	− 1.06 (2.6)	0.86 (0.2)	− 0.88 (2.2)	0.10 (0.0)
	D^{OC}	− 8.92 (3.1)	− 0.84 (2.2)	2.78 (0.7)	− 0.26 (0.6)	4.40 (1.2)
	D^{A}	− 9.03 (3.11)	0.25 (0.6)	2.67 (0.7)	0.30 (0.7)	3.27 (0.9)
	D^{O}	− 16.71 (4.7)	− 0.44 (0.9)	− 5.01 (1.2)	− 0.51 (1.1)	− 4.14 (1.0)
Interaction:	yD^{WE}	− 0.35 (0.2)		− 1.78 (1.0)		− 1.82 (1.0)
within-culture	yD^{LA}	1.21 (2.0)		− 0.23 (0.4)		− 0.12 (0.2)
slopes	yD^{OC}	0.98 (2.7)		− 0.46 (1.0)		− 0.58 (1.2)
	yD^{A}	1.12 (2.8)		− 0.32 (0.7)		− 0.39 (0.8)
	yD^{O}	1.96 (4.8)		0.52 (1.1)		0.41 (0.8)
	N	100	100	100	100	100
	R^2	0.75	0.78	0.79	0.80	0.81
	Reset	9.0 *	7.8 *	9.9 *	8.5 *	8.4 *

of the within-slopes become significant, and the coefficient on y remains virtually unchanged. Consequently, a separate within-culture slope does not exist in the data, and Fig. 7 is a better representation of the data than Fig. 6.

5.3. Has the effect of culture vanished?

The effect of the cultural areas decreases when the transition is included as seen in Tables 7 and 8. The only culture-variable that keeps the same sign and is (mostly) significant in the mixed model is Western Europe. Thus, the WE group is relatively uncorrupt, even when the wealth of the countries is considered.

In most of the mixed models, it still appears that Latin America is relatively corrupt, but the coefficient is not fully stable. The interaction between culture, inflation and regulation (just discussed) might work to produce precisely that result. Spain and Portugal (in the residual group), which have chosen the WE economic system, both have almost WE levels of corruption.

The old communist countries are also (mostly) negative outliers in terms of corruption though the coefficient is far from robust. The deviation is probably caused by the (often) chaotic process of transition from socialism and the ensuing high inflation. However, the negative deviation becomes negligible when the low GDP level and the high inflation of these countries are included in the model.

Finally, note that the remaining two groups even change signs from the culture model (reg 16) to the mixed model (reg 20). This shows that Africa has high corruption *only* due to poverty—not for cultural reasons. The oriental countries are a little more corrupt than they should be at their level of development. However, one

may argue that since they became rich quickly, they have not had the time to adjust the corruption level.[25]

When these findings and arguments are contemplated, little of the "culture theory of corruption" remains. Other studies have found significant cultural variables in corruption functions, but they always contribute little when the economic variables are included.[26]

6. Interaction and dynamics of the economic transition and corruption

The empirical analysis reported in Section 5 confirms the impression created from looking at Fig. 2. The stylized picture of interaction of culture and economic transition on corruption is as depicted in Fig. 7. The present section takes this picture for granted and presents an interpretation.

6.1. The seesaw model

The first simple deduction from Fig. 7 is that culture influences the GDP *more* than it influences corruption. In other words, countries tend to become either too corrupt or too clean for their GDP level and culture.[27] Since the underlying transition pattern is strong, corruption must have *an inherent tendency to tip either way in a seesaw way.* A seesaw model hence needs to be constructed. Fortunately, this is an easy job.[28]

The model builds upon four points (A) to (D) in Table 9. Most of the mechanisms are self-explanatory, so only a few comments on each of the four points are needed to put the model together.

It is easy to formalize (A) by a simple sorting model with two types of jobs, where one has a corruption potential and the other has none. One equilibrium with the same wage occurs if all are honest. However, if there are two types of workers—one corrupt and one uncorrupt—who are indistinguishable for the employer, another equilibrium emerges. The corrupt create an extra demand for jobs with a high corruption potential, competing down their salaries—and vice versa for the jobs with no such potential. The relatively low salaries for the jobs with high potential then drive away the honest. So the corrupt obtains the jobs with the high-corruption potential, while the honest concentrate in jobs without such potentials. This will surely increase corruption.

[25] From casual observation, it appears that the process of adjustment is going on. The populations in countries as Japan and South Korea seem to react rather strongly to the "good old ways" of large-scale mutual gift-giving that has characterized the relation between politics and business.

[26] Treisman (2000) and Paldam (2001) find that the Protestant religion becomes rather significant. Treisman further finds that former British colonies are less corrupt than other former colonies. See also the study by Husted (1999). However, it appears that the marginal R^2 of all cultural variables tried in mixed economic–cultural models do not exceed 0.1.

[27] Several cases of neighboring countries such as Argentina and Chile come to mind. They have almost the same GDP level and similar cultures. It is surprising that their κ-scores are as different as 3.0 and 6.9, respectively.

[28] The name of the mechanism is new, but it is built from old, well-known parts. The model was used already in various versions in Andvik and Moene (1990) and Paldam (1990), who both refer back to predecessors. See also Chand and Moene (1999) and Hillman and Ursprung (2000) for new generalizations of similar models.

Table 9
Four mechanisms behind the seesaw mechanics

Mechanism	High corruption ⇦ ⇦ ⇦	⇨ ⇨ ⇨ Low corruption
(A) Incidence	Wages down will chase out honest	Labor markets clear for honest
(B) Punishment	Everybody cannot be punished	Some can be punished
(C) Advertisement	Flaunting *R* advertises "business"	Flaunting *R* alerts police
(D) Welfare	*R* can be enjoyed without fear	*R* must be consumed in secret

R is the proceeds from corruption.

(B) Everybody cannot be punished, so corruption is a low-risk activity in societies with high corruption, and vice versa. (C) To run a corruption "business", it is important to advertize to the "customers". This can be done more effectively, the lower the risk of punishment. In very corrupt societies, one sees civil servants, with a modest salary, being "men above town" driving fine new Mercedeses. This is not only welfare enhancing in itself (D) for these civil servants. It also advertises their business.

Conversely, consider a low-corruption environment. Here both (D) the consumption of the proceeds of corruption and (C) the advertisement of the corruption business must take place with great care and fear. If it comes to the attention of too many, it will eventually attract the police (B).

The relative income hypothesis adds a powerful mechanism. The corrupt living relatively well acts as a spur for the uncorrupt to join the club. In a low-corrupt society, everybody develops a similar lifestyle, so using the proceeds of the corruption is not easy.

The arrows in the top boxes (of Table 9) indicate that the pattern is dynamic. A *pivot* must thus exist. If corruption is above the pivot, the seesaw swings toward still more corruption. If it is below the pivot, the seesaw swings the other way. It is well known that countries—or sectors within a country—that have turned bad, have a hard time turning honest. Though, once a bad sector gets over the pivot, it will converge to honesty.

A set of mutually enforcing mechanisms may thus drive countries away from the central path given by the transition model. The seesaw has an inherent tendency either to tip toward more corruption or less corruption.

6.2. Some speculation on the dynamics

The analysis till now is rather data-near, and it is backed by the statistical analysis. Two mechanisms have been found: A transition path of corruption and the seesaw dynamics away from the line. These two mechanisms must interact. It is worth moving a little ahead of the testable and to theorize on the interaction. Two main questions will be discussed:

(Q1) What is the location of the pivots on which the seesaws turn? In Fig. 7, they are drawn as a horizontal line. As long as nothing else is known, this is the theory produced by Occam's Razor.[29]

[29] What is needed is that the pivot line is flatter than the transition line. I think that the pivot line may have some little dependency on the GDP level. Short-run risk reduction is at a greater premium in LDCs than DCs, as the consequence from an income loss is much higher. The temptation of corruption is thus higher in LDCs.

With a flat pivot line, one should observe that richer countries are more likely to be above the pivot line, where the seesaw dynamics takes them to low corruption. Note that the WE group has a very steep within-slope. This suggests that (nearly) all of the WE-cultural area is above the pivot-line. As other countries have high (and stable) corruption, they must be below the pivot line, which must consequently be flatter than the transition line. It is further evidence of a flat pivot line that also the richest Oriental countries (notably Singapore) have converged to low corruption.

Note that this explains the *corner observation* of Section 3.7. That is, it explains why the WE-block is in the upper-right corner of Fig. 2 (and several other figures), and thus the nonlinearity of the corruption function.

(Q2) How is the long-run dynamics of the full country sample? The analysis suggests mechanisms that work in both causal directions:

The dynamics *from transition to corruption*: Countries that become richer have an increasing probability of passing the pivot. In Fig. 7, the oval culture-areas are drawn with most of the area below the pivot-line for poor countries, and with most of the area above the pivot line for the rich countries. The inherent dynamics therefore become increasingly helpful for eliminating corruption as countries grow richer. By this mechanisms, the transition causes a reduction in corruption.

The dynamics *from corruption to transition*: If honesty is a factor of production, relatively honest countries grow faster, and therefore make a faster transition.[30] By this mechanism, a reduction in corruption leads to a faster transition. If this mechanism stood alone, the absence of corruption in the DCs would be a result of a self-selection process.

Both mechanisms may work at the same time. The transition of corruption may be an integral part of the complex process of the grand economic transition. Fortunately, some parts of the simultaneous interaction are weak. We have concentrated on a few of the stronger parts involving corruption.

7. Conclusions

This paper attempts to explain the large pattern in the corruption index from Transparency International. A simple one-equation corruption equation that accommodates a set of seven simple operational hypotheses has proved to explain most of the pattern. The results will first be summarized, and a few policy implications will then be considered.

7.1. Summary of results

The statistical analysis gives three strong and three tentative conclusions. It is well known from the literature that it is hard to find truly robust coefficients in cross-country regressions, so also the tentative conclusions will be listed—in order of strength.

By far, the most important determinant of corruption has turned out to be real GDP per capita. The complex transition from a poor traditional country to a wealthy liberal

[30] The estimates give little support for this mechanism.

democracy also includes a dramatic reduction in the level of corruption. The corruption transition is not placed at a precise location along the transition path, but follows a *transition-trend toward less corruption*.

The transition is influenced by culture, so countries with the same "basic culture" cluster along the transition path. However, countries are more similar in GDP level than in the level of corruption within the same cultural area. Culture is thus an inferior explanation of the level of corruption. This finding is interpreted as a demonstration of a *seesaw dynamics* of corruption around the transition-trend: countries tend to have either too much or too little corruption relative to the transition trend.

Inflation increases the level of corruption with a relatively short time horizon—such as 5–10 years. This effect is strong, but not fully stable. Inflation is partly a consequence of the economic system, and since countries within the same cultural area often have similar economic systems, the effect of inflation interacts with the cultural areas.

Of the three tentative conclusions, the first is still likely, while the others are very dubious: Countries with much regulation—little "economic freedom"—have a large potential for rent seeking. They also tend to have high corruption. However, the regulatory regime is an important part of the economic system; consequently, it interacts with the inflation variable and the cultural areas.

Democracy seems to decrease corruption; however, since both variables interact strongly with the level of transition, the independent effect of democracy is dubious. Finally, low corruption might lead to higher growth, but the effect is small and fragile. Honesty is thus a weak and dubious factor of production.

7.2. Policy implications of the results

There are four policy conclusions. The first two deal with the long run and with the cultures of societies. These conclusions are not useful to the reforming politician.

The first conclusion is that economic growth, by increasing the speed of transition, also (eventually) cures the social ill of corruption. The second conclusion is the negative finding that the "cultural determinism" view of corruption has fared poorly. I have found little basis for the belief that corruption is so deeply embedded in the culture of the society as to be unchangeable.[31] Corruption varies greatly within the same cultural area. This variance has been ascribed to the inherent seesaw dynamics of corruption.

The last two policy conclusions are more useful as they relate to the short run. High inflation quickly increases corruption. This is an additional reason to give a high weight to price stability. Finally, the seesaw pattern found in corruption suggests pivots. A small push to reduce corruption (in a sector or a whole country) is unlikely to push corruption over the pivot. Mediocre efforts are likely to have only transitory effects. However, a sufficiently large effort can push corruption across the pivot, and then corruption will fall by itself.

[31] This view is reflected in statements such as: In "Latin America" or "Africa", nothing can be done about corruption. Corruption is so deeply integrated into the culture as to be almost a "law of nature".

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Further reading

Netsources

Fraser Institute. Data on "economic freedom" are available from ⟨http://www.fraserinstitute.ca/econ.htm⟩.
Freedom House: The Gastil index is available from ⟨http://www.freedomhouse.org⟩. See also under printed references.
IBRD Anti-corruption knowledge resource center. Much information available including *An Annotated Bibliography*. No date, but frequently updated. Address: ⟨http://www.worldbank.org/html/extdr/anticorruption⟩.
Internet Center for Corruption Research. A Joint Initiative of Göttingen University and Transparency International. Source for Corruption Index. Address: ⟨http://www.gwdg.de/~uwvw/icr.htm⟩ or ⟨http:/www.transparency.de⟩.