Globalisation and corruption
Learning how to become less corrupt

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Abstract:

When a country interacts with foreign countries, it exposes itself to foreign culture and behaviour. This exposure could influence the domestic culture through imitation or adaptation in the same way as individuals tend to be influenced in their behaviour by the groups that they frequent. This could carry over to business culture in general and the corruption culture specifically. Therefore, the main hypothesis in this paper is that as a country participates in the global market the corruption culture in the foreign countries with which it interacts affects the domestic corruption culture.

In the theoretical model developed to test the main hypothesis, we put forth two assumptions. The first is that as the level of exposure to a foreign country increases its influence on the domestic corruption culture increases.

The second is that the greater the difference between the foreign and the domestic corruption culture the greater is the impact on the domestic corruption culture.
The empirical testing of the dynamic model developed validates the claim that interaction with foreign countries has an influence on the domestic level of corruption. The magnitude is dependent on the level of corruption, as well as the degree of exposure to the foreign countries.

Key words: Globalisation, Corruption, Cultural Transmassion and trade

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1 Introduction:

This paper will discuss how corruption in a country is influenced by exposure to foreign countries and their business cultures. The basic idea put forth in the introduction is, I believe, equally valid for many different types of behaviours in organisations in general, encompassing bureaucracies as well as companies. But, I will for sake of simplicity and clarity choose to talk only about countries and corruption since the empirical testing is done on country level corruption.

How does a country become less corrupt? Is it possible to make a complete turnabout from one day to the next or is this transformation a gradual one. Is the change something that is wholly dependent on internal factors or does the surroundings influence the internal change? To the first part of the question it is definetly plausible that the answer is that the change is gradual, instantaneous changes from one steady state to another is something, generally, assumed more out of convenience than realism. Therefor it is fruitfull to extended corruptionsstudies explicitly to changes and not only focus on levels as has earlier most often been the case (references). On the second part it would be highly unlikely that external factors would not influence the internal situation. This is often neglected, hence the theoretical focus of this paper will solely be on external influences. In the empirical part internal influences are of course controlled for when external influences are investigated.

That exposure to the surrounding world has a positive impact on a country's level of corruption has been tested and verified explicitly as well as implicitly (cf. Ades and Di Tella, 1999, Treisman, 2002, Sandholtz and Gray, 2003 and Beets, 2005). This study differentiates itself from these studies by taking into account not only how large this exposure is to the surrounding world but also to which countries the domestic country is exposed. Further the model developed and tested is dynamic thus analysing changes and not levels as previous studies has done.

If the way of doing business is also influenced by external factors, then we should change and adapt to these external factors. If we do change, it is be because we see that the adaptation increases our wellbeing if not we would resist it. The speed of our adaptation will be dependent on our cognitive ability, so even if we want to change it might take time not only to understand how we should go about to effectuate this change but also to figure what actually has to be changed. We learn by repeated interactions, the higher the frequency the greater the impact. So the more exposed a country is to external influence the greater will the impact of those external influences be on the country. Or differently phrased the beneficial spill-over effects between countries increases with the degree of exposure.

One country which has experienced great improvements of the corruption level is Hong-Kong. In 1977 only 32% believed that tipping a government official was an offence ten years later the number was 72% (Hauk and Saez-Martin). This country is also a very open country and has become even more so; over the same time period exports as a percent of GDP increased by almost 50% (World Bank, 2007). In 2005 Hong Kong had a score of 8 on Transparency International's (TI) Corruption Perception Index (CPI) placing it among the 20 least corrupt countries in the world ranking before countries like USA and Japan (TI, 2005).

How much a country is influenced in its own, internal, behaviour by external factors is dependent on the exposure to these external factors. If only small parts of the country are exposed the impact will be smaller than if a large part of the country is exposed. In figure (1) below we have two different domestic countries (H_a and H_b), depicted by the circles with bold lines, exposed to foreign countries (F_i and F_j), depicted by circles with thin lines. The exposure here is the intersection between foreign and domestic country, i.e. the shaded areas. The degree of exposure for country H_a would be less than exposure for country H_b. Country H_a would be an economy with scant contact with the outside world, a closed economy, while country H_b would be a more open economy. A larger exposure makes it more likely that the behaviour in the internal economy is influenced. If a group is exposed to different behaviours, the impact of each will be dependent on their respective degree of exposure. For country H_b that means that the influence is roughly the same from both foreign countries while for country H_a the influence from one country, F_i, is much larger than the influence from the other, F_j.

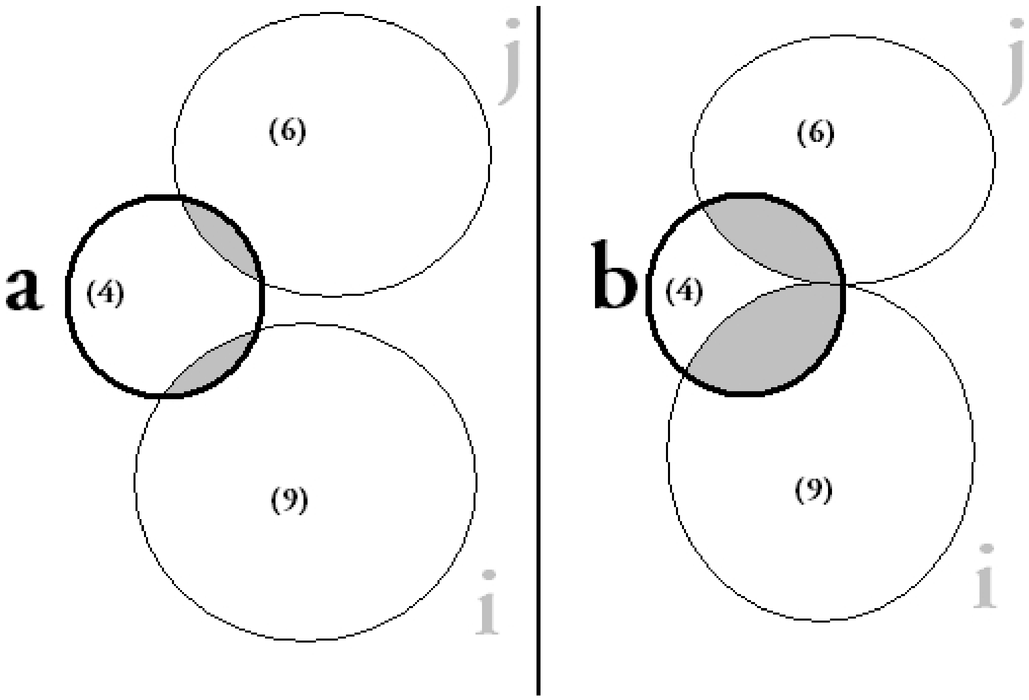

Figure 1: Exposure to different business cultures: The bold lined circle is the domestic country, the thin lined circle is the foreign countries (i,j). The shaded areas are the exposure of the domestic country to foreign countries.

If the behaviour is almost identical between the domestic and foreign country the possible change will be smaller than if there is a substantial difference. So the greater the difference is the greater will the absolute impact on the internal behaviour be. If the economy could directly incorporate these new influences, the corruption level in the country would be equal to weighted average of the internal level and the external levels, with the weight being proportional to exposure, i.e. the size of each field inside the bold circle. If the adaptation is not perfect however the change will never be complete, i.e. if we assume that there exist a function, C, such that the multidimensional concept of corruption can be mapped into a number on the real line the change will always be smaller than the difference between the weighted average of area 1,2 and 3 and the present level of corruption. In figure (1) .

Example 1 *Given a function $C : R^n \rightarrow R$ each area in the figure would thus be connected to a level of corruption C. The external level of corruption, C_{ext}, would be the weighted average of the corruption value in each foreign country, F_i, that the domestic country, H, is exposed to with the weight, μ_i, being the relative size of the intersection between the domestic country and each foreign country.*

$$C_{ext} = \sum_i \mu_i C_i, \ i \in N$$
$$A_i = F_i \cap H, \ i \in N$$
$$\mu_i = \frac{A_i}{(A_i \cup A_j)}, \ i, j \in N, \ i \neq j$$

And the level towards which the domestic country will converge would be the weighted average of the internal and external level, with the weight, λ, being the relative size each area $\lambda_F = \frac{(A_i \cup A_j) \cap A_H}{A_H}$ and $\lambda_D = \frac{A_D \backslash ((A_i \cup A_j) \cap A_H)}{A_H}$. Using the information in figure (X) the level of corruption for each country is $F_1 = 9$, $F_2 = 6$ and $H = 4$, with a higher value indicating less corruption, further assume that the size of each area is $A_1 = 0.3$, $A_2 = 0.15$ and $A_3 = 0.55$. Then the internal level of corruption, C_{int}, is 4, the external level of corruption is $9 \cdot \left(\frac{0.3}{0.3+0.15}\right) + 6 \cdot \left(\frac{0.15}{0.3+0.15}\right) = 8$ and the value towards which the internal level will move is $8\left(\frac{0.45}{0.55+0.3+0.15}\right) + 4 \cdot \left(\frac{0.55}{0.55+0.3+0.15}\right). = 5.8$. If the convergence would be instanteneous the change, Δ_C, would be equal to $\Delta_C = 5.8 - 4 = 1.8$ assuming only partial convergence Δ_C would be positive but less than 1.8.

Exposure and difference will interact, meaning that a small exposure but a large difference might yield the same change as a large exposure with a small difference. The total change of the internal behaviour will thus be dependent on these two variables and the internal behaviour will move some distance towards a weighted average of the internal level and the external levels that the country is exposed to.

Corruption is a way of doing business, a way which is not tolerated by the public in most developed countries. Further corruption has been put forth as hindering development in a number of different studies. By interacting with relatively incorrupt countries, the corrupt countries will be forced to do business using less corruption. This should have a positive effect on the corruption level in the domestic economy. This effect will greater for countries with larger exposure to the global economy. The effect will also be greater the lower the level of corruption is in the receiving country.

Some evidence that a company adepts to the culture in which it sells its goods can be gleaned in Transparency Internationals study Bribe payers index (BPI) from 2006. Companies from corrupt countries behave in a less corrupt way in OECD countries, than in their home country, the same is true for companies from OECD countries which behave more corruptly in developing nations than in their home country.

I believe that this relationship will only hold for countries that trade with less corrupt countries. Doing business without corruption is superior to doing business with corruption, this means that countries which are less corrupt than their trading partners will not become more corrupt by engaging in trade with them. Thus the model does not predict a general convergence to the mean. An analogy could be that if two badminton players of unequal talent play, the bad player will become better while the good player doesn't become worse.

So the country is exposed to different foreign business cultures but the change is of course dependent on how large this exposure is. This is captured by weighting the exposure by the size of the external economy to the total economy.

2 Model:

Note that the model is quite similar to thermodynamic models like Newton's law of cooling, for an introduction on Thermodynamics see Jordan (1999).

Assume the following differential equation

$$CPI'(t)_i = \beta\left(\overline{CPI}_i - CPI_i\right),\ \beta \in (0,1) \tag{1}$$

With the following definitional equations

$$\overline{CPI}_i = \lambda_i \widehat{CPI}_i + (1-\lambda_i)\, CPI_i,\ \lambda_i \in [0,1] \tag{D1}$$

$$\widehat{CPI}_i = \sum_{j=1}^{n} \mu_{ij} CPI_j,\ \sum_{j=1}^{n} \mu_{ij} = 1 \tag{D2}$$

The corruption level in a country, CPI_i, will thus converge towards $\overline{CPI}_i$ if $\overline{CPI}_i$ remains fixed. The change will greater the further the economy is from the steady state level $\overline{CPI}_i$. With CPI_i being the domestic or internal level of corruption for country i and β being a constant governing the change in corruption thus representing the spill-over effect. Further $\widehat{CPI}_i$ is the weighted average of the corruption level of foreign countries with which country i interacts, where a larger weight, μ_{ij}, is put on countries with which the domestic country has relatively more interaction, where foreign countries are indexed over j. $\widehat{CPI}_i$ will be referred to as the external or foreign level of corruption for country i and the parameter λ_i being a measure of the total exposure to foreign economies.

In $(D2)$ I weigh the corruption level in each receiving country by the proportion of the exporting country's total trade that goes to that specific country. If the share of export is equally large to each country the weighted average would be the arithmetic mean. The level towards which the corruption level converges is a weighted average of the external level of corruption that the country is exposed to and the internal level. The greater the exposure to foreign business cultures the greater will the weight put on the external level of corruption become.

The constant β can be seen as a spill-over effect, a measure of the leakage of the know-how of doing business more efficiently with out using corruption the foreign to the domestic country. Since β is assumed to be positive we can make that strong interpretation of β because if it was more efficient to do business with corruption than without we would have a negative β.

Given the information in the definitional equations then (1) can be rewritten as follows

$$CPI_i' = \beta\left(\lambda_i * \widehat{CPI}_i - \lambda_i * CPI_i\right)$$

$$CPI_i' = \beta\lambda_i\left(\widehat{CPI}_i - CPI_i\right) \quad (2)$$

and in the empirical section below it is equation (2) that will be used and the parameter β that will be estimated.

The solution to equation (2) is given in (3)[2]. The solution to (2) makes it possible to plot the evolution of corruption over time as is done below in figure (2) if we assume $\widehat{CPI}_i$ to be fixed over time.

$$CPI\,(t)_i = \widehat{CPI}_i - \left(\widehat{CPI}_i - CPI\,(0)_i\right)e^{-\beta\lambda_i t} \quad (3)$$

or equivalently

$$CPI\,(t)_i = \widehat{CPI}_i\left(1 - e^{-\beta\lambda_i t}\right) + CPI\,(0)_i\,e^{-\beta\lambda_i t}$$

A graphical representation of equation(3)is shown below in figure (2)

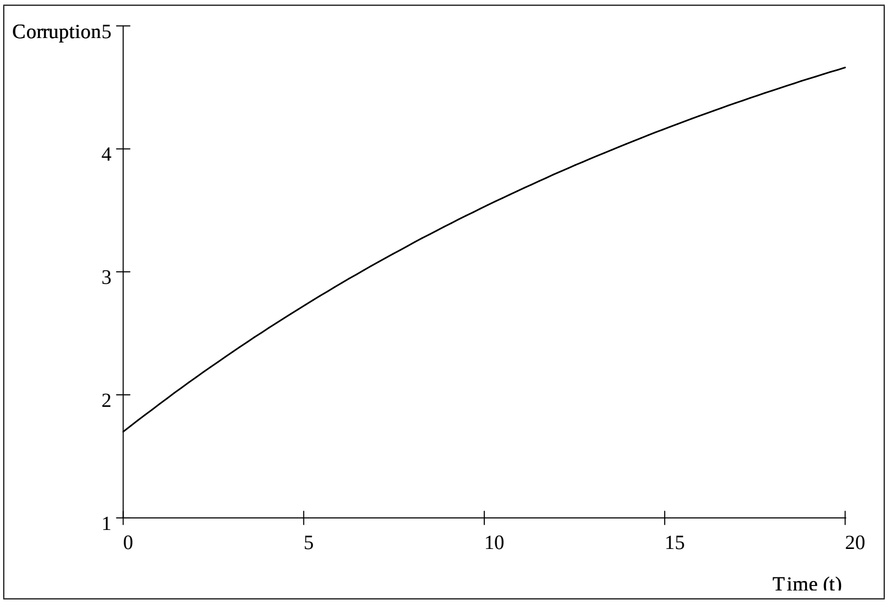

Figure 2: Evolution of corruption for a country with corruption level 1.7 at time 0 and trading partners with an average level of corruption equal to 6.5 an exposure of 0.4 having a β of 0.123 and an

[2]Let $CPI = y$ and $\widehat{CPI} = \gamma$ then $y' = -\alpha\beta\,(\gamma - y)$ which gives particular solution $y_p = \gamma$ and general solution $y_h = Ce^{\alpha\beta t}$. Further $C = y - y = -(y - \gamma)$ since $y\,(0) = \gamma + C$.

3 Empirics

To test equation (2) I estimate the following equation using OLS

$$\Delta CPI_{it} = a + b\lambda_{it}\left(\widehat{CPI}_{it} - CPI_{it}\right) + \varepsilon_{it} \tag{4}$$

ΔCPI_i is the change in corruption for country i between t and $t+1$, b is the estimate of β from equation (2), a is an intercept with expected value 0 and ε_{it} is a normally distributed error term. The term $\widehat{CPI}_i$ is calculated using the definitional equations D1-D2.

The computation of $\widehat{CPI}_{it}$ demands a quantification of the exposure measure μ_{ij}. For the regression a proxy of this variable has been calculated using equation (5) below, where export_{ijt} is export from country i to country j at time t.

$$\mu_{ijt} = \frac{\text{export}_{ijt}}{\sum_{j=1}^{n} \text{export}_{ijt}} \tag{5}$$

In the calculations of μ_{ijt}, $n \subset N$,where N is the universal set of countries with which country i trade and n is the set of countries with which country i trade and there is data available. It is possible to construct a coverage measure $\Omega_{it} = \frac{\sum_{j=1}^{n} \text{export}_{ijt}}{\sum_{j=1}^{N} \text{export}_{ijt}}$ for each country, this shows how much of the country's total trade that is included in the analysis. A value of 1 would signify that the corruption measure is available for all countries with which country i trades.

The calculation of the measure of exposure, λ_{it} is done according to the following equation with export being the total value of exports at time t for country i.

$$\lambda_{it} = \frac{export_{it}}{GDP_{it}} \tag{6}$$

Both variables are measured in constant 2000 dollars and are taken from the World Bank's World Development Indicators (2007). I choose to only measure exports and not imports. This is done because I believe that one has to adapt more to a different culture to be able to sell a good than to buy a good. Buying a good as a tourist in a country where you do not know the language seldom poses any problems but selling goods would be harder.

3.1 Data

The data set includes 55 low and low-middle income countries between 2000-2005, it is unbalanced with only 22 countries having observations every year. The $trade_{ij}$ variable is measured by the value of the exports from exporting country i going to the receiving country j. The correct calculation of $\widehat{CPI}$ according to $(D2)$ and (**??**) demands information on corruption on all trade partners for each country in the sample. This is sadly not available so the measures are calculated over the n available countries. The $\widehat{CPI}$ estimate is probably a slight overestimation since the countries where data is unavailable are probably among the most corrupt. Still since the estimate is a weighted average over all countries it should be fairly accurate especially given the fact that the average coverage, $\overline{\Omega}$, in the unbalance data set is equal to 90% of the total trade value of a country. To check the robustness of the results supplementary equations excluding observation with $a$low coverage will be run.

All empirical analysis made of corruption is troublesome due to the illegal nature of the phenomenon. This makes it hard to quantify the extent of corruption in a country in any meaningful way. Objective data such as the number of corruption convictions raise many questions about validity and can be misleading. For example, the fact that a country has few or no convictions of corruption could have several explanations. One explanation is that corruption indeed is a minor problem. However, it can also be the case that the number of convictions is low due to inefficient law enforcement or a forgiving attitude towards corruption. Is Argentina uncorrupt since there have only been 23 convictions over the last 25 years or could it be the opposite that the country is very corrupt since the other 730 cases ended with no convictions? Therefore, in order to provide a more correct picture perhaps corruption is better measured indirectly using subjective rather than objective data.

The difficulties in measuring corruption discussed above merits a description of the CPI. The CPI has been reported since 1995 and the number of countries covered has gradually increased. In the 2004 survey, 146 countries were included. The CPI ranges from 0 to 10 where 10 equals a perfectly clean country while 0 indicates a country where business transactions are entirely dominated by corruption. The CPI is a composite index and is constructed from several different sources in the form of surveys of business people as well as assessments by country analysts, 18 different sources were used for the 2004 survey. The index is thus in part based on subjective opinions and is a measure of perceived and not actual corruption. Assessments from the three previous years are combined to reduce variations.

Corruption as measured by the CPI-index is surely a variable which might suffer from measurement errors, but remember that given that all the normal assumptions about the variables are fullfilled a measurement error of the dependent variable will not make the estimations biased since the measurement error will be captured by the error term. The other variables used trade, gdp and gdp per capita should not suffer especially from measurement errors and for developing countries they are probably among the most robust, trade being measured bilaterally and GDP and GDP per capita having been measured for a long time.

3.2 Results

A pooled ols with fixed yearly effects and robust standard errors has been run using the Stata-software. As a normality test, the Kolmogorov-Smirnov non-parametric test, was run. The result did not reject the null hypothesis of normal distribution[3]. Given the normality the test for heteroscedasticity chosen was Breusch-Pagan-Godfrey, a test sensitive for normality but more powerful than the, for non-normality, robust White's general heteroscedasticity test. Since heteroscedasticity was according to the BPG-test the regression was run using White's heteroscedasticity-corrected standard errors. A Durbin-Watson statistic[4] to test for autocorrelation was computed, with a value of 1.738 it is greater than the higher bound and thus we can assume that the residuals are not serially correlated over time. No dummy variable is significant even at the 20% level and hence the results are not displayed in the table below. The residuals are normally distributed according to the Kolmogorov-Smirnov non-parametric test. To test for the use panel data techniques a LM-test as described by Breusch and Pagan (1980) was run. A test statistic of 1.35 shows that we can not reject the null hypothesis of no random effects

[3] The significance level was only 0,69 thus we can surely reject the null-hypothesis

[4] The D-statistic was calculated using the following formula $\widehat{\rho} = \frac{\sum(\widehat{\varepsilon}_t \widehat{\varepsilon}_{t-1})}{\sum \widehat{\varepsilon}_t^2}$ and $d = 2(1 - \widehat{\rho})$

3.2.1 Robustness

Other specification such as a pooled ols without dummy variables and balanced data set (reducing the number of observations) with and without dummy variables has been run with the results staying robust. The same goes for inclusion of GDP/cap and/or GDP/cap growth rate as control variables as well as excluding the countries with the least trade coverage[5]. The reason for including the control variables GDP/cap and/or GDP/cap growth rate is that GDP per capita is highly correlated with the level of corruption. A regression using the average value over the time period 2000-2005 of the dependent and independent variable was also run with very similar results[6]. To check for omitted variables or misspecification Ramsey's RESET test was run, the result suggesting that no variables has been omitted[7]. The same results, of no misspecification, holds using the durbin-watson test for misspecification, where a d-statistics of 2.01 clearly does not reject the null hypothesis of no misspecification.

Table 1: Results of OLS-regression w/ robust standard errors for base line model (1) and model w/ control variables (2)

Variable	(1a)	(1b) w.d	(1c) tc>0.8	(2a)	(2b) w.d	(2c) tc>0.8
b	.123***	.121***	.115***	.118***	.120***	.105***
	(3.35)	(3.50)	(2.95)	(3.05)	(3.16)	(2.54)
a	-.118***	-.164*	-.103**	-.117*	-.150	-.084
	(-2.72)	(-1.80)	(-2.14)	(-1.70)	(-1.40)	(-1.02)
ΔGDPcap				.003	-.001	0.03
				(0.36)	(-0.09)	(0.30)
GDPcap				-.000	-.000	-.000
				(-0.36)	(-0.32)	(-0.76)
R^2	0.05	0.08	0.05	0.05	0.08	0.05
df	249	249	207	249	249	207
F	11.22	3.72	8.73	3.97	2.73	3.36

(*/**/***) significance at the 10/5/1 percent level, the (a) model is the base line model, the (b) model is the base line model with year dummies, and the (c) model is the base line model including only countries with a trade coverage (tc) of over 80%

The reason for including the control variables GDP/cap and/or GDP/cap growth rate is that GDP per capita is highly correlated with the level of corruption and hence one could suspect that both the level of GDP/cap as well as the change in GDP/cap could influence the change in

[5] $\Delta CPI_{it} = a + b\lambda_{it}\left(\widehat{CPI}_{it} - CPI_t\right) + \varepsilon_{it}$, using OLS as well using fixed effect panel data with year effects, and for both types four additional regressions have been run excluding all observations with $\Omega < 0.5$, $\Omega < 0.7$, $\Omega < 0.8$ or $\Omega < 0.9$

$\Delta CPI_{it} = a + b_1\lambda_{it}\left(\widehat{CPI}_{it} - CPI_t\right) + b_2 GDPcap_{it} + \varepsilon_{it}$, using OLS as well using fixed effect panel data with year effects, and for both types four additional regressions have been run excluding all observations with $\Omega < 0.5$, $\Omega < 0.7$, $\Omega < 0.8$ or $\Omega < 0.9$

$\Delta CPI_{it} = a + b_1\lambda_{it}\left(\widehat{CPI}_{it} - CPI_t\right) + b_2 GDPcap_{it} + b_3\frac{\Delta GDPcap_{it}}{GDPcap_t} + \varepsilon_{it}$, using OLS as well using fixed effect panel data with year effects, and for both types four additional regressions have been run excluding all observations with $\Omega < 0.5$, $\Omega < 0.7$, $\Omega < 0.8$ or $\Omega < 0.9$

[6] R^2 : 0.11 and significant b estimate (at the 1% level) of 0.120.

[7] $F(3, 244) = 0.78$, Prob > F = 0.5076 and H_0 being no misspecification

corruption. Corruption can and have been seen as a measure of institutional quality and thus the discussion of whether good institutions causes growth (Acemoglou et al 2001, 2002) or whether it is growth that causes good institutions (Glaeser et al 2004) should be controlled for . If growth has a short term impact on institutions we should see a positive and significant coefficient on GPD per capita growth. That we should not be surprising given the short time period over which the analysis is done and should thus not be taken as a strong indication on growth's effect on institutions.

But what about using a panel data approach, the base line model was run using random and fixed effects with country as grouping variable, a hausman specification test was run to choose between the fixed and random effect model. The best model was according to this criterion a fixed effect model, albeit with a small margin ($\chi^2_{(1)} = 4.08 \Longrightarrow$ p=0.0435) . This was tested against the OLS model using an F-test[8], the F-tested suggested, again with a small margin, that the fixed effects model should be used instead of a pooled ols ($F = 1.50 \Longrightarrow p = 0.025$). As a safety measure an LM-test as described by Breusch and Pagan (1980) was run to test the random effects model with against the pooled OLS.model. A test statistic of 1.35 shows that we can not reject the null hypothesis of no random effects, thus suggesting that a pooled OLS is a better specification than a random effects model. Adding the control variables to the fixed effect regression had as most notable effect that the F-test suggested that a pooled OLS is the most appropriate model to be used ($F = 1.71 \Longrightarrow p = 0.13$). A Hausman test also suggests that a random effects model should be used ($\chi^2_{(3)} = 4.52 \Longrightarrow p = 0.2103$). Using the LM-test for the random effects once more yields the result that a pooled OLS should be used ($\chi^2_{(1)} = 1.13 \Longrightarrow p = 0.29$). But adding the restriction that only countries where the trade coverage is over 80% has as result that the Hausman test once more suggests a fixed effect model ($\chi^2_{(3)} = 13.00 \Longrightarrow p = 0.0046$) and further the F-test once more suggest that the fixed effect model is more appropriate than the pooled OLS ($F = 1.88 \Longrightarrow p = 0.002$).

(*/**/***) significance at the 10/5/1 percent level, the (3) model is fixed effects and (4) is random fixed effects. The (a) model is the base line specification, the (b) model is the base line w/ control variables and the (c) model is the (b) model but including only countries with tc>80%. Test vs. OLS is a F-test for the fixed effects model and an LM-test for the random effects model, Hausman test is testing the a/b/c-models for fixed and random effects against each other and are reported under the model (fixed or random) that is suggested by the hausman test

(*/**/***) significance at the 10/5/1 percent level, the (5) model is an OLS on the average values with (a) being the base line model (b) base line w/ control variables and (c) base line incl. only observation with tc>80% and (6) is a balanced panel estimated with (a) OLS (b) fixed effects and (c) random effects. Test vs. OLS is a F-test for the fixed effects model and an LM-test for the random effects model, Hausman test is testing the a/b/c-models for fixed and random effects against each other and are reported under the model (fixed or random) that is suggested by the hausman test

In table (3) we present the results using average values for the time period 2000 to 2005 and the results using a balanced panel data. As can be seen the results are in line with the results

[8]The F-test is used to test the null hypothesis that all country specific intercepts are equal to zero and thus that a pooled OLS should be used

Table 2: Results of Fixed effects (3) and Random effects (4) models w/ robust standard errors

Variable	(3a)F	(3b)	(3c) tc>0.8	(4a)re	(4b)	(4c) tc>0.8
b	.302***	.305**	.439***	.142***	.140***	.127***
	(2.62)	(2.58)	(3.16)	(3.27)	(3.07)	(2.58)
a	-.285**	-.268	-.048	-.139*	-.144	-.101
	(-2.55)	(-1.18)	(-0.17)	(-2.69)	(-1.85)	(-1.13)
ΔGDPcap		-.002	-.002		-.002	.001
		(-0.20)	(-0.16)		(0.24)	(0.16)
GDPcap		−.000	-.000		-.000	-.000
		(-0.04)	(-1.34)		(-0.07)	(-0.5)
R^2	0.05	0.05	0.04	0.05	0.05	0.05
No obs	249	249	207	249	249	207
F/χ^2	F=11.57	F=3.84	F=6.58	$\chi^2_{(1)} = 12.66$	$\chi^2_{(3)} = 10.98$	$\chi^2_{(3)}= 8.77$
Test vs. OLS	F=1.50	F=1.71	F=1.88	$\chi^2_{(1)} = 1.35$	$\chi^2_{(1)} = 1.13$	$\chi^2_{(1)} = 3.13$
	p=0.025	p=0.13	p=0.002	p=0.245	p=0.289	p= 0.077
Hausman	$\chi^2_{(1)} = 4.08$		$\chi^2_{(3)} = 13.00$		$\chi^2_{(3)} = 4.52$	
	p=0.0435		p=0.0046		p=0.2103	

in table (1) and (2), the point estimates are around 0.12 for (pooled) ols and random effects estimates and significantly larger fixed effects estimates.

The point estimate, b, of the spill-over constant β is positive and significant meaning that we have a transfer of knowledge from less corrupt economies to more corrupt economies on how to become less corrupt. The actual change is greater if the economy is more open in the sense of exporting more. Meaning that globalisation efforts as to facilitate exports from developing to developed countries should have positive effect of the corruption level in the developing world. The actual change is also greater if the difference between the corruption level in the receiving countries and the domestic country is big, a kind of catch-up effect where countries that are further away from the steady-state has a tendency to experience greater change. This catch-up effect however is conditional in the sense that it depends on who you trade with, the less corrupt the trading partners are the greater is the impact on the domestic economy.

The difference in look between figure (2) and (3) concerning predicted value is that in figure (2) exposure and external corruption was held constant over time while in figure (3) it changed each year due to changes in trading patterns.
The intercepts significance level depends on the specification chosen, in the simplest model without any control or dummy variables or selection criterion it is significant at the 5% level and negative. While with control variables it turns out to be insignificant. Any interpretation of the constant is thus precarious, but one tentative explanation of a negative intercept would be that corruption tends to feed on itself. Meaning that corruption has a tendency to create a vicious cycle, where corruption and poverty together breeds more corruption.

4 Conclusion:

The results points towards the fact that a poor developing country will have positive effects on corruption by engaging in trade. The effect is greater the less corrupt the trade partners are

Table 3: Results of the baseline model w/ and w/o control variables using average values for the time period (5) and using a balanced data set w/ robust standard errors

Variable	(5a)	(5b)	(5c) tc>0.8	(6a)	(6b)	(6c)
b	.120** (2.57)	.116** (2.29)	.103** (2.33)	.110** (2.18)	.482** (2.96)	.114** (2.25)
a	-.126** (-2.22)	-.174* (-1.75)	-.115* (-1.98)	-.134 (-1.50)	-.377 (-1.32)	-.137 (-1.52)
ΔGDPcap		.008 (.36)		.010 (1.35)	.009 (0.84)	.010 (1.36)
GDPcap		.000 (0.71)		-.000 (-0.41)	-.000 (-0.42)	-.000 (-.40)
R^2	.11	.13	.10	.07	.06	.07
No obs	55	55	45	132	132	132
F/χ^2	6.63	2.92	5.42	3.5	3.06	$\chi^2_{(4)} = 12.94$
Test vs. OLS					F=1.43 p=.12	$\chi^2_{(1.110)} = .09$ p=.77
Hausman					$\chi^2_{(3)} = 11.12$ p=.01	

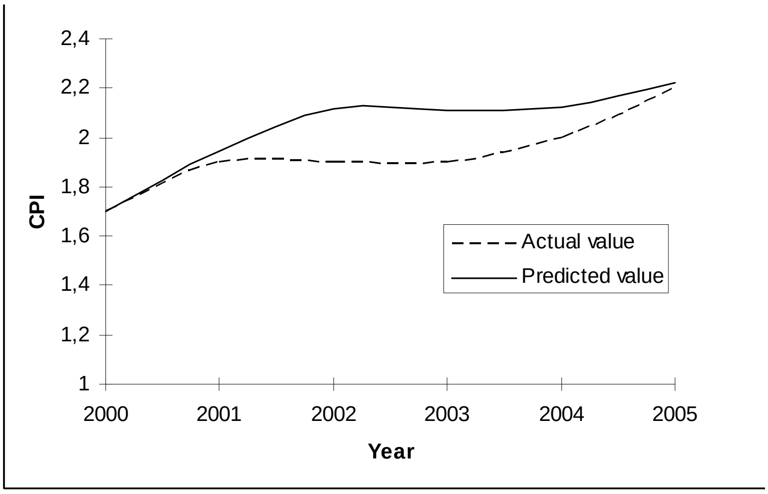

Figure 3: Indonesia's corruption using actual data in equation (3) and the estimated b from the base line model

and the larger the value of trade is compared to gdp. So a more open economy will experience greater positive effects from the interaction with less corrupt economies. We thus have both a qualitative effect and a quantitative effect of interaction.

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