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SAND OR GREASE IN THE WHEELS?

Kouramoudou Kéita
Hannu Laurila

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Governance and corruption – sand or grease in the wheels?

Kouramoudou Kéïta
School of Management, FI-33014 University of Tampere, Finland
keita.kouramoudou@student.uta.fi

Hannu Laurila

School of Management, FI-33014 University of Tampere, Finland
hannu.laurila@uta.fi

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Abstract

Conventional wisdom is that corruption is a major obstacle of economic development. Yet, there is an unresolved debate in the economic literature whether corruption is detrimental (Sand the Wheels Hypothesis - SWH) or beneficial (Grease the Wheels Hypothesis - GWH). While SWH is the mainstream idea, the proponents of GWH argue that corruption may be beneficial if governance is badly malfunctioning. Méon & Sekkat (2005) opposes this view by stating that corruption not only hampers growth and investments but even more so if governance is bad, which is what SWH strictly says. This paper challenges the finding by imitating the study with broader data. The results corroborate GWH and comport with Méon & Weill (2008), which finds that corruption enhances aggregate efficiency. The conclusion is that, in the second-best world of many developing countries, corruption may in effect mitigate the deeply rooted distortions caused by flaws in rule of law and government efficiency. Therefore, efforts should be put rather on reinforcing the legislative and administrative systems than on the plain fight against corruption.

Keywords: Corruption, Governance, Growth, Investments

JEL classification: D73

1 Introduction

A common understanding is that corruption is bad for economic development, and that it must be fought out by all means. Still, there are also dissidents, including benevolent academics, who see some virtues in it, too. In the literature of the economic effects of corruption, there is a fundamental and still unresolved debate about whether the Sand the Wheel Hypothesis (SWH) or the Grease the Wheels Hypothesis (GWH) is valid. Proponents of SWH say that corruption is harmful (e.g. Mauro, 1995; Mo, 2001), while those of GWH claim the opposite (e.g. Leff, 1964; Mendez & Sepulveda, 2006).

The key argument of the proponents of GWH is that further distortions caused by corruption in effect mitigate more profound distortions that are deeply rooted in the malfunctioning governance of the corrupted countries. In its strict form, GWH says that corruption is not only beneficial but particularly so if the quality of governance is bad. The mirror image of this is strict SWH, saying that the effects of corruption are the ghastlier the worse is the quality of governance.

For an interested reader, Méon & Sekkat (2005) provides a comprehensive survey on the literature on the SWH-GWH debate. The paper also presents an empirical analysis on the effects of corruption on economic growth and investments, and finds strong support for strict SWH, namely that corruption is found especially harmful if the quality of governance is poor. Thus, the idea of corruption as a lubricant in bypassing pre-existing distortions is definitely revoked. On the other hand, Méon & Weill (2008) finds clear support for GWH when considering the effects of corruption on aggregate efficiency instead of growth and investments. The disparity of these results is puzzling because one could expect that aggregate efficiency would be positively related to growth and investments.

The interplay between efficiency, investments and growth would certainly be worthy of closer study, but this paper takes a smaller step by tackling the puzzle by re-checking the results of Méon & Sekkat (2005). This is done simply by using more extensive data, like the original paper actually suggests.[1] This paper proceeds as follows. Section 2 describes the modelling and data, and section 3 reports the results of regular regression analysis and discusses the findings. Section 4 presents recursive tests to illustrate and better understand the results, and section 5 concludes. The analysis yields sound support for GWH thus differing drastically from the conclusions of Méon & Sekkat (2005), and complying with those of Méon & Weill (2008).

2 Data and modelling

Following Méon & Sekkat (2005), three data sets are used, namely macroeconomic data, corruption indices and governance indicators. Macroeconomic data consist of panel data from 117 countries worldwide (listed in Appendix 1) including information on real GDP per capita, and on typical determinants of economic growth, namely physical capital, human capital, scope of internationalization, and population growth. Physical capital is measured by average capital stock and denoted *Investment*. Human capital, denoted *Education*, is measured by the index of individual human capital based on schooling years (Barro & Lee, 2010) and returns to education (Psacharopoulos, 1994). The scope of internationalization, denoted *Openness*, is measured by the extent of international trade. The demographic factor of growth, namely

[1] Appendix B of the original paper also lists some odd indicator values, but digging into whether they are typos or not is omitted here.

population growth, is denoted *Population*. The data, available over 1970-2011, are provided by Penn World Tables version 8.1 (Feenstra *et al.*, 2015), except *Openness* which comes from the 7.1 version.

Corruption is monitored by two widely used indices. The first index set comes from the World Bank (included in *Worldwide Governance Indicators*, and denoted *WGI*), available over 1996-2013. The second set of indices comes from Transparency International (*Corruption Perception Index*, denoted *CPI*), published since 1995.

The quality of governance is also monitored by the World Bank's Worldwide Governance Indicators, and they are originally constructed by Kaufmann *et al.* (1999). The following indicators are used: *Voice and accountability* (denoted *VA*) which "reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media"; *Political stability and lack of violence/terrorism* (denoted *LV*) which "reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism"; *Government effectiveness* (denoted *GE*), which "reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality if policy formulation and implementation, and the credibility of the government's commitment to such policies"; *Regulatory burden* (denoted *RB*) which "reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development"; and *Rule of law* (denoted *RL*) which "reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence".

The data sets are considerably broader than those in Méon & Sekkat (2005). The macroeconomic data set covers 117 countries over 1970-2011 compared to 70 countries over 1970-1998. Corruption indices and governance indicators are used for 1998, 2000, and 2002–2011, while Méon & Sekkat (2005) focuses only on 1998. Years 1999 and 2001 are omitted because *WGI* is not available for those years.

Two models are constructed, one for explaining economic growth, and the other for explaining investments that are supposed to create growth. The first model reads

$$(1) \qquad y_t - y_0 = \alpha_0 + \alpha_1 * y_0 + \alpha_2 * z + (\alpha_3 + \alpha_4 * gov) * cor + \varepsilon,$$

where t stands for periods, α:s are the coefficients to be estimated, and ε is the error term. On the left-hand side of equation (1), $y_t – y_0$ measures the variation of real GDP per capita (at chained Purchasing Power Parities in 2005 US dollars), and y_0 is real GDP per capita in 1970. The initial GDP appears also on the right-hand side for a test of the conditional convergence hypothesis (Barro, 1991; Mankiw & Weil, 1992). By the hypothesis, $\alpha_1<0$ would say that poorer countries catch up the richer ones by imitating their products, technologies and business models.

In equation (1), z *is* a vector of the typical determinants of GDP growth for 1970-2011. Quite reasonably, *Investment* and *Education* should foster growth, and so should also *Openness* by enhancing the transfer of technologies, ideas, and best business practices (Benhabib & Spiegel, 1994; Scully, 2002). For all three, the hypothesis is that $\alpha_2>0$. On the other hand, *Population* should hinder GDP growth in per capita terms ($\alpha_2<0$, see Levine & Renelt, 1992).

In equation (1), *cor* is a vector of the two corruption variables. The original *WGI* scores vary from -2.5 to 2.5, and the original *CPI* scores vary from 0 to 10, with the lower bounds indicating utmost corruption and the upper bounds indicating perfect integrity. For ease of interpretation, the original values are transformed by subtracting the original *WGI* scores from 3.5, and the original *CPI* scores from 11. Thus, the transformed *WGI* scores from 1 to 6, and the transformed *CPI* scores from 1 to 11. For both indices, 1 indicates perfect integrity and the upper bound utmost corruption.

In equation (1), *gov* is a vector of the governance indicators. The original World Bank indicators score from -2.5 to 2.5, with quality improving to the positive direction. Again, the indicators are transformed by subtracting the original values from 3.5. This makes all the transformed indicators *VA*, *LV*, *GE*, *RB*, and *RL* vary from 1 to 6, where the quality of governance falls as the score rises. The term *gov*cor* refers to the interaction of corruption and the quality of governance. The interaction terms are constructed by multiplication of the two corruption indices and the five governance indicators thus yielding 10 interaction terms in total.

The second model explains the effects of corruption on investments. Physical capital appears now as a dependent variable, expressed in terms of variation, and *Population* is skipped from the explanatory variables. Equation (2) reads

$$(2) \qquad k_t - k_0 = \beta_0 + \beta_1 * y_0 + \beta_2 * \omega + (\beta_3 + \beta_4 * gov) * cor + \mu$$

where $kt - k_0$ represents the variation of the capital stock, β:s denote the coefficients to be estimated, and μ is the error term. On the right-hand side of equation (2), y_0 appears again in the spirit of the conditional convergence hypothesis arguing that $\beta_1<0$, and ω denotes the vector of the remaining macroeconomic variables, *Education* and *Openness*, with the assumption that $\beta_2>0$. The interaction terms between the quality of governance and corruption are again included.

3 Estimation results

In the estimations, the Generalized Least Squares technique is used to handle heteroscedasticity. Following Méon & Sekkat (2005) and initiated by Mankiw & Weil (1992), all variables enter regressions in logarithmic values. The data on corruption and governance cover the years 1998, 2000 and 2002–2011, but the following discussion focuses on the most recent years 2009, 2010, and 2011. This is reasonable, because they include more countries than the earlier years, and because the uncommented estimations do not yield markedly different results. This holds especially for the year 1998 (see Appendix 2) so that all conclusions can be compared to those of Méon & Sekkat (2005), including the robustness checks, which are reported in Appendix 3.

The preliminary specifications of models (1) and (2) include the set of control variables of the dependent variables, and the corruption variables thus yielding estimates for α_0–α_3 and β_0–β_3, respectively. The full regression specifications include also the interaction terms between corruption and governance thus yielding estimates for α_4 and β_4, too. The main interest is on the estimates for α_3 and α_4, and β_3 and β_4. The benchmark result for validating SWH (and rejecting GWH) would be α_3, β_3 <0; α_4, β_4>0, and the benchmark result for validating GWH (and rejecting SWH) would be α_3, β_3 >0; α_4, β_4 <0.

3.1 Effects on GDP per capita growth

The complete estimation results of the effects of corruption on GDP per capita growth for the years 2009, 2010 and 2011 are summarized in *Table 1*.

Table 1: *Variation of real GDP per capita (with corruption and governance data of 2009- 2011)*

Explanatory variables		PS		PS & *VA*		PS & *LV*		PS & *GE*		PS & *RB*		PS & *RL*	
		WGI	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*
Intercept	09	0.51	0.46	0.49	0.43	0.43	0.34	1.54·	1.29	1.13	0.97	0.98	0.74
		(0.89)	(0.95)	(0.89)	(0.95)	(0.85)	(0.91)	(0.84)	(0.88)	(0.87)	(0.93)	(0.82)	(0.87)
	10	0.39	0.33	0.36	0.32	0.39	0.31	1.32	1.10	0.95	0.84	0.85	0.66
		(0.90)	(0.97)	(0.90)	(0.97)	(0.87)	(0.94)	(0.85)	(0.91)	(0.89)	(0.96)	(0.84)	(0.91)
	11	0.107	0.103	0.097	0.106	0.126	0.106	0.964	0.911	0.594	0.592	0.640	0.588
		(0.890	(0.935)	(0.892)	(0.935)	(0.868)	(0.913)	(0.850)	(0.899)	(0.885)	(0.938)	(0.847)	(0.897)
y_0	09	-0.43***	-0.41***	-0.43***	-0.41***	-0.44***	-0.44***	-0.47***	-0.47***	-0.46***	-0.45***	-0.46***	-0.47***
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.07)	(0.07)	(0.06)	(0.06)
	10	-0.41***	-0.39***	-0.41***	-0.40***	-0.43***	-0.42***	-0.44***	-0.45***	-0.44***	-0.43***	-0.45***	-0.45***
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
	11	-0.40***	-0.38***	-0.40***	-0.38***	-0.41***	-0.41***	-0.43***	-0.44***	-0.42***	-0.42***	-0.43***	-0.44***
		(0.072)	(0.072)	(0.072)	(0.072)	(0.070)	(0.071)	(0.067)	(0.069)	(0.071)	(0.072)	(0.068)	(0.070)
Investment	09	0.09**	0.08**	0.09**	0.08**	0.11***	0.11***	0.06*	0.06*	0.08**	0.07*	0.07**	0.07**
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)
	10	0.09**	0.08**	0.09**	0.08**	0.11***	0.11***	0.06*	0.06*	0.08**	0.08*	0.07**	0.07*
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
	11	0.087**	0.076*	0.088**	0.075*	0.109***	0.102**	0.066*	0.065*	0.082**	0.076*	0.072**	0.069*
		(0.029)	(0.031)	(0.029)	(0.031)	(0.029)	(0.033)	(0.027)	(0.029)	(0.028)	(0.031)	(0.027)	(0.030)
Education	09	1.78***	1.82***	1.67***	1.75***	1.53***	1.58***	1.28***	1.30***	1.46***	1.48***	1.44***	1.49***
		(0.30)	(0.32)	(0.32)	(0.34)	(0.30)	(0.31)	(0.29)	(0.31)	(0.30)	(0.32)	(0.28)	(0.30)
	10	1.72***	1.77***	1.63***	1.73***	1.48***	1.52***	1.20***	1.23***	1.41***	1.46***	1.41***	1.46***
		(0.31)	(0.33)	(0.34)	(0.35)	(0.32)	(0.33)	(0.31)	(0.32)	(0.32)	(0.34)	(0.30)	(0.32)
	11	1.76***	1.83***	1.737***	1.856***	1.508***	1.57***	1.244***	1.284***	1.438***	1.499***	1.461***	1.516***
		(0.326)	(0.338)	(0.350)	(0.366)	(0.334)	(0.348)	(0.325)	(0.345)	(0.340)	(0.360)	(0.316)	(0.332)
Population	09	0.001	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	10	0.004	0.002	0.005	0.003	0.006	0.005	0.004	0.005	0.004	0.003	0.002	0.003
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	11	0.002	-0.006	0.003	-0.007	0.005	0.0005	0.005	0.007	0.002	0.0005	-0.002	-0.001
		(0.019)	(0.02)	(0.02)	(0.022)	(0.019)	(0.02)	(0.018)	(0.019)	(0.019)	(0.02)	(0.018)	(0.019)
Openness	09	0.36***	0.35***	0.37***	0.36***	0.33***	0.32**	0.29**	0.27**	0.32***	0.32**	0.32***	0.31**
		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.09)	(0.09)	(0.10)	(0.10)	(0.09)	(0.09)
	10	0.37***	0.36***	0.38***	0.37***	0.34***	0.34***	0.31***	0.30***	0.34***	0.33***	0.33***	0.33***
		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.09)	(0.10)	(0.10)	(0.10)	(0.09)	(0.10)
	11	0.39***	0.377***	0.389***	0.374***	0.368***	0.36***	0.335***	0.323***	0.365***	0.354***	0.347***	0.338***
		(0.103)	(0.105)	(0.104)	(0.106)	(0.101)	(0.103)	(0.096)	(0.099)	(0.100)	(0.103)	(0.097)	(0.100)
WGI	09	-0.32·		-0.05		0.72*		1.48***		0.77*		1.48***	
		(0.18)		(0.36)		(0.35)		(0.40)		(0.38)		(0.41)	
	10	-0.32·		-0.08		0.61		1.53***		0.69		1.46***	
		(0.18)		(0.39)		(0.38)		(0.43)		(0.40)		(0.45)	
	11	-0.241		-0.174		0.597		1.566***		0.773·		1.493**	
		(0.185)		(0.407)		(0.384)		(0.451)		(0.427)		(0.472)	
CPI	09		-0.21		-0.01		0.52·		1.29***		0.58·		1.19***
			(0.15)		(0.28)		(0.27)		(0.33)		(0.30)		(0.33)
	10		-0.20		-0.13		0.45		1.19***		0.47		1.06**
			(0.15)		(0.29)		(0.28)		(0.34)		(0.31)		(0.34)
	11		-0.146		-0.191		0.411		1.074**		0.488		0.961**
			(0.150)		(0.291)		(0.281)		(0.338)		(0.312)		(0.343)

*Table 1*continues on the next page.

*Table 1*continued.

*WGI*VA*	09			-0.18 (0.22)									
	10			-0.16 (0.23)									
	11			-0.04 (0.241)									
*CPI*VA*	09				-0.07 (0.15)								
	10				-0.04 (0.16)								
	11				0.029 (0.165)								
*WGI*LV*	09					-0.67*** (0.203)							
	10					-0.60** (0.22)							
	11					-0.55* (0.222)							
*CPI*LV*	09						-0.45** (0.14)						
	10						-0.41** (0.15)						
	11						-0.36* (0.153)						
*WGI*GE*	09							-1.23*** (0.25)					
	10							-1.24*** (0.26)					
	11							-1.21*** (0.279)					
*CPI*GE*	09								-0.90*** (0.18)				
	10								-0.85*** (0.19)				
	11								-0.77*** (0.195)				
*WGI*RB*	09									-0.78** (0.24)			
	10									-0.71** (0.25)			
	11									-0.71** (0.27)			
*CPI*RB*	09										-0.51** (0.17)		
	10										-0.45* (0.18)		
	11										-0.43* (0.187)		
*WGI*RL*	09											-1.15*** (0.24)	
	10											-1.12*** (0.26)	
	11											-1.09*** (0.276)	
*CPI*RL*	09												-0.79*** (0.17)
	10												-0.73*** (0.18)
	11												-0.66*** (0.186)
N	09	117	114	117	114	117	114	117	114	117	114	117	114
	10	115	112	115	112	115	112	115	112	115	112	115	112
	11	116	113	116	113	116	113	116	113	116	113	116	113
Adj.-R^2	09	0.466	0.453	0.469	0.454	0.512	0.499	0.557	0.549	0.510	0.493	0.552	0.542
	10	0.459	0.445	0.461	0.445	0.492	0.479	0.546	0.530	0.493	0.475	0.533	0.515
	11	0.454	0.444	0.454	0.444	0.481	0.469	0.529	0.511	0.484	0.468	0.518	0.499

Note: The table reports the estimated coefficients of the regression variables with superscripts "***", "**", "*", "·" indicating statistical significance at 0, 0.1, 1, 5, and 10 % error level, respectively. GLS standard deviations are in parenthesis.

In *Table 1*, the estimates of the intercept term are overall positive (α_0>0), but statistically insignificant. In Méon & Sekkat (2005), the estimates are negative with notably bigger numbers, but insignificant, too. The coefficient of y_0 is always negative (α_1<0), and highly significant saying that the poorer economies catch-up the richer ones, just like the conditional convergence hypothesis claims. Furthermore, the coefficient estimates of the control variables *Investment*, *Education*, and *Openness* all get their expected signs (α_2>0) with high significance, but that of *Population* remains very close to zero, and insignificant. In any case, the statistical significance of the estimates of the control variables is markedly higher than in Méon & Sekkat (2005).

In the preliminary specification (column PS of *Table 1*), the explanatory variables seem to fit the model as they explain almost half of its variance (the adjusted R^2 varying between 44.39 and 46.90 %). The coefficients of both corruption variables *WGI* and *CPI* stay negative (α_3<0) over the three years, which suggests that corruption would hamper GDP growth over the whole sample. However, the estimate values are notably small compared to those in Méon & Sekkat (2005), and all of them remain statistically insignificant, whereas Méon & Sekkat (2005) reports considerably high significance for the coefficient of the *WGI* index.

The remaining 5 columns of *Table 1* report estimations with $\alpha_4 \neq 0$ in equation (1). The inclusion of the interaction terms does not affect the signs and significance of the control variables, but a substantial improvement is observed in the percentage of explained variance. Compared to PS, the adjusted-R^2 has increased in average about 4.65 (with *WGI*) and 4.44 (with *CPI*) percentage points over the period 2009–2011. The estimates of the corruption coefficients turn mostly positive (α_3>0) and their significance is improved, especially with *GE* and *RL*.

In most cases, the coefficient tests associated with the interaction terms significantly reject the null hypothesis α_4 = 0 at the 5 % level thus telling about existing interplay between the quality of governance and corruption. A closer look on the governance variables in *Table 1* shows that, with *VA*, the estimates of both α_3 and α_4 remain statistically insignificant. The estimates with respect to *LV* or *RB* are a bit more reliable, at least what comes to the effect of *WGI* and the respective interaction term. The GWH claim that corruption tends to boost growth is thus modestly supported in countries that face flaws concerning *LV* or *RB*. In these countries, α_3>0 and α_4<0 tell that the positive growth effect of corruption is even strengthened as the quality of governance deteriorates. Still, the significance test shows that the explanatory power of the variables *VA*, *LV*, and *RB* is somewhat questionable. Méon & Sekkat (2005) also casts doubts on *VA* and *RB*, but finds some support to SWH when *LV* is concerned.

The estimates including *GE* and *RL* seem more robust, as the impacts of corruption, and those of the interaction terms on the dependent variable are always statistically significant (see *Table 1*). In contrast with Méon & Sekkat (2005), the regressions yield strong support to GWH. The coefficients of both *CPI* and *WGI* variables display positive and significant estimates (α_3>0) saying that corruption encourages growth in countries with shortcomings in government effectiveness (*GE*) or rule of law (*RL*), compared to the rest of the countries in the sample. This is also confirmed by the negative and significant coefficients of the interaction terms associated with *GE* and *RL* (α_4<0). These estimates unequivocally say that corruption tends to boost growth as *GE* or *RL* degrades, which is exactly what the strict form of GWH claims.

3.2 Effects on capital accumulation

The estimation results of the effects of corruption on capital investments for the years 2009, 2010 and 2011 are summarized in *Table 2*.

Table 2: *Variation of capital stock (with corruption and governance data of 2009-2011)*

Explanatory variables		PS		PS & *VA*		PS & *LV*		PS & *GE*		PS & *RB*		PS & *RL*	
		WGI	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*
Intercept	09	2.72*	2.36·	2.76*	2.55*	2.92*	2.56*	3.28**	2.70*	3.13*	2.59*	3.11**	2.56*
		(1.22)	(1.26)	(1.20)	(1.23)	(1.21)	(1.25)	(1.21)	(1.25)	(1.23)	(1.28)	(1.17)	(1.22)
	10	2.78*	2.68*	2.90*	2.91*	3.00*	2.85*	3.28**	2.93*	3.15*	2.85*	3.14**	2.84*
		(1.25)	(1.31)	(1.23)	(1.27)	(1.25)	(1.32)	(1.24)	(1.31)	(1.27)	(1.34)	(1.21)	(1.29)
	11	2.31·	2.57*	2.52*	2.70*	2.46*	2.65*	2.80*	2.86*	2.71*	2.78*	2.79*	2.91*
		(0.124)	(1.26)	(1.22)	(1.22)	(1.24)	(1.27)	(1.22)	(1.27)	(1.24)	(1.29)	(1.19)	(1.25)
y_0	09	-0.38***	-0.37***	-0.39***	-0.37***	-0.38***	-0.38***	-0.42***	-0.41***	-0.41***	-0.39***	-0.42***	-0.42***
		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
	10	-0.38***	-0.38***	-0.39***	-0.38***	-0.39***	-0.39***	-0.41***	-0.41***	-0.41***	-0.39***	-0.43***	-0.43***
		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
	11	-0.37***	-0.38***	-0.38***	-0.39***	-0.37***	-0.39***	-0.39***	-0.41***	-0.39***	-0.40***	-0.42***	-0.43***
		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Education	09	0.91*	0.96*	1.24**	1.43**	0.80·	0.90*	0.45	0.59	0.63	0.78·	0.50	0.63
		(0.42)	(0.43)	(0.45)	(0.45)	(0.42)	(0.42)	(0.46)	(0.46)	(0.45)	(0.46)	(0.42)	(0.43)
	10	0.84·	0.85·	1.19*	1.37**	0.73	0.78·	0.34	0.49	0.58	0.72	0.44	0.54
		(0.44)	(0.44)	(0.47)	(0.46)	(0.44)	(0.44)	(0.48)	(0.49)	(0.47)	(0.48)	(0.44)	(0.45)
	11	0.95*	0.93*	1.35**	1.52**	0.85·	0.89·	0.42	0.62	0.61	0.77	0.51	0.61
		(0.45)	(0.45)	(0.48)	(0.48)	(0.46)	(0.46)	(0.49)	(0.51)	(0.49)	(0.50)	(0.45)	(0.47)
Openness	09	0.40**	0.40**	0.36*	0.34*	0.34*	0.34*	0.38**	0.37**	0.39**	0.38**	0.38**	0.36**
		(0.14)	(0.14)	(0.14)	(0.13)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.13)	(0.13)
	10	0.40**	0.39**	0.36*	0.33*	0.36*	0.36*	0.39**	0.38**	0.39**	0.38**	0.39**	0.38**
		(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
	11	0.42**	0.40**	0.37**	0.34*	0.39**	0.39**	0.40**	0.39**	0.41**	0.39**	0.40**	0.38**
		(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
WGI	09	0.02		-0.86		0.84		1.41*		0.88		1.92**	
		(0.27)		(0.55)		(0.54)		(0.64)		(0.59)		(0.65)	
	10	0.01		-0.98*		0.74		1.52*		0.80		1.99**	
		(0.27)		(0.58)		(0.57)		(0.69)		(0.62)		(0.70)	
	11	0.18		-0.93		0.65		1.72*		1.15*		2.33**	
		(0.28)		(0.60)		(0.57)		(0.71)		(0.66)		(0.72)	
CPI	09		0.14		-0.76·		0.66		1.07*		0.55		1.46**
			(0.22)		(0.40)		(0.39)		(0.54)		(0.46)		(0.51)
	10		0.08		-0.92*		0.46		0.86		0.35		1.18*
			(0.23)		(0.41)		(0.41)		(0.54)		(0.47)		(0.54)
	11		0.13		-0.89*		0.28		0.75		0.43		1.15*
			(0.22)		(0.40)		(0.40)		(0.52)		(0.47)		(0.52)

Table 2 continues on the next page.

Table 2 continued.

*WGI*VA* 09			0.60· (0.33)									
10			0.67* (0.34)									
11			0.72* (0.35)									
*CPI*VA* 09				0.56** (0.21)								
10				0.631** (0.22)								
11				0.66** (0.22)								
*WGI*LV* 09					-0.54· (0.30)							
10					-0.48 (0.32)							
11					-0.31 (0.33)							
*CPI*LV* 09						-0.32 (0.20)						
10						-0.24 (0.21)						
11						-0.10 (0.21)						
*WGI*GE* 09							-0.94* (0.40)					
10							-1.00* (0.42)					
11							-1.02* (1.43)					
*CPI*GE* 09								-0.55 (0.29)				
10								-0.47 (0.29)				
11								-0.39 (0.30)				
*WGI*RB* 09									-0.61 (0.37)			
10									-0.56 (0.39)			
11									-0.67 (0.41)			
*CPI*RB* 09										-0.27 (0.26)		
10										-0.18 (0.27)		
11										-0.20 (0.28)		
*WGI*RL* 09											-1.21** (0.38)	
10											-1.24** (0.41)	
11											-1.35** (0.42)	
*CPI*RL* 09												-0.75** (0.26)
10												-0.63* (0.28)
11												-0.60* (0.28)
N 09	117	114	117	114	117	114	117	114	117	114	117	114
10	115	112	115	112	115	112	115	112	115	112	115	112
11	116	113	116	113	116	113	116	113	116	113	116	113
Adj.-R^2 09	0.193	0.207	0.216	0.253	0.214	0.225	0.230	0.232	0.211	0.214	0.257	0.259
10	0.194	0.206	0.220	0.260	0.208	0.214	0.231	0.223	0.207	0.209	0.253	0.240
11	0.203	0.214	0.232	0.271	0.209	0.216	0.239	0.226	0.221	0.218	0.267	0.245

Note: The table reports the estimated coefficients of the regression variables with superscripts "***", "**", "*", "·" indicating statistical significance at 0, 0.1, 1, 5, and 10 % error level, respectively. GLS standard deviations are in parenthesis.

Table 2 shows that the signs of the estimates of the intercept terms are positive over the three years, and significant with only one exception. Initial income y_0 keeps its negative and significant coefficient, confirming again the conditional convergence hypothesis. The estimates of the control variables are consistent (while not always significant) with the theory of the determinants of investment (Levine & Renelt, 1992) saying that both human capital and trade liberalism should contribute positively to the accumulation of capital stock. Méon & Sekkat (2005) reports similar results, but finds the estimate of *Openness* insignificant.

In the preliminary specification of equation (2), the estimates of both corruption coefficients are always positive, but small and never statistically significant. Méon & Sekkat (2005) reports negative and significant findings in 1998, but in the current sample and over the three years, no clear linkage between corruption and capital accumulation exists. Thus, the SWH-GWH dilemma remains unresolved. Taking the quality of governance into account (that is $\beta_4 \neq 0$), there is only modest changes in the estimates on the control variables. All enter the regressions with their expected signs, but the positive effect of human capital becomes less meaningful. On the other hand, the positive estimates of the corruption coefficients gain more weight and significance. Overall, the explanatory power of the estimations improves compared to the preliminary specification.

Again, the estimates on the particular governance variables vary. Those regarding *LV* or *RB* do not establish a clear relationship between corruption and the variation of capital stock. The corruption coefficients are positive and those of the interaction terms are negative, but both are statistically insignificant. Thus, it cannot be determined how corruption affects the capital stock in countries where *LV* or *RB* is unsatisfactory. Considering *VA*, the estimations give partial support to SWH. In 2010 and 2011, the estimates for the *CPI* coefficients are negative and significant, and the estimates of the coefficients of the corresponding interaction terms are positive and significant. The respective coefficients regarding *WGI* are less definitive. Yet, in countries with weak *VA*, corruption seems to hinder investment, and the effect gets worse as *VA* declines further.

The estimations with respect to *GE* and especially *RL* give again notable support for GWH. Both corruption coefficients get positive and significant estimates, while those of the interaction variables are negative and significant, especially with *RL*. This indicates that the lower the quality of governance, measured in terms of *GE* or *RL*, the more corruption fosters capital accumulation. This is exactly what strict GWH claims. The results differ markedly from Méon & Sekkat (2005), which omits *RB* and *VA*, and finds clear support for SWH when *RL*, *GE* or *LV* is considered as the indicator of the quality of governance.

4 Recursive tests

Méon & Sekkat (2005) provides recursive tests as ‘preliminary investigations’ of the impacts of corruption with respect to the quality of governance by estimating corruption coefficients sequentially over sub-samples which gradually include countries with better and better quality. The test results are illustrated by plotting the estimated corruption coefficients against the quality of governance. The strict form of SWH is supported, because all plots lay in the negative area and compound a clearly rising trend. Support for strict GWH would have necessitated a falling trend on the positive area. To be sure, the results of the investigation are then confirmed by regular estimations (corresponding to those in Section 3 of this paper). No controversy between the two sets of results is found.

Here, recursive tests and regular estimations are used in reverse order: the tests are used to better understand the results of Section 3. The recursive tests are based on the preliminary specifications of equations (1) and (2), that is at α_4, β_4 =0. Instead of using the interaction terms, sub-sampling technique is used to tackle the effect of the quality of governance. The tests are made for the year 2009 with *WGI* as the corruption index, and *RL* and *GE* as the governance indicators.

4.1 GDP growth

Following Méon & Sekkat (2005), countries in the whole sample are ranked from the lowest to the highest quality of governance, measured by the original scores of *RL* and *GE*. For both indicators, sub-samples are constructed so that the first sub-sample includes 90 observations of countries with the lowest scores (that is countries from the lowest up to the 90th lowest), the second sub-sample covers observations from the 2nd lowest to the 91st lowest score, and so on. Thus, there are 28 sub-samples in total, of which the last one includes countries from the 90th best to the one with the absolutely best quality score. *Figure 1* plots the coefficients of the corruption from the sequential estimations based on the sub-samples.

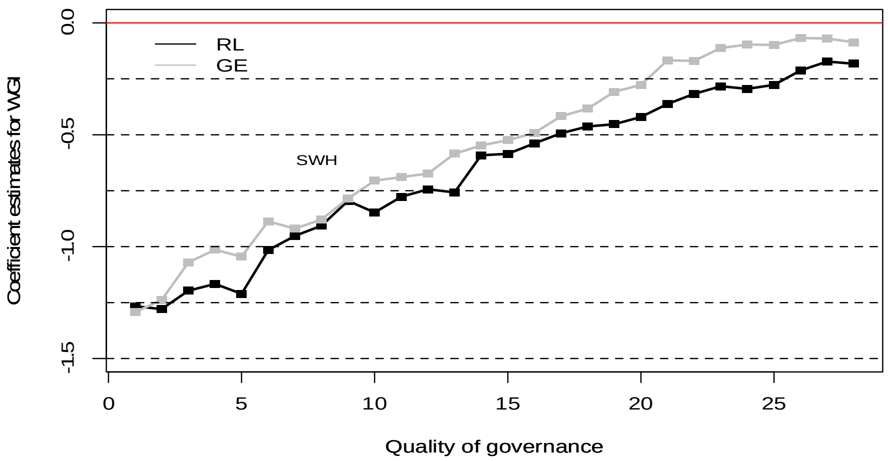

Figure 1: Estimated impact of corruption on GDP per capita according to *RL* and *GE* in the whole sample

In *Figure 1*, the upward trend of both of the plotted curves unequivocally supports SWH by showing that the negative effect of corruption on GDP growth gradually diminishes with the improvement of *RL* and *GE*. This accords with Méon & Sekkat (2005, Figure 2 and Table 2), and with this paper's preliminary estimation results in *Table 1, panel a*, column PS. However, the finding is not in line with the estimation results presented in the *GE* and *RL* related columns of *Table 1, panel a* (whereas there is no such disparity of results in Méon & Sekkat, 2005). The disparity is because all estimates from the sequential estimations are based on almost 77 % observations of the whole sample thus including an overwhelming amount of countries with good quality of governance. Thus, the illustrative result of the preliminary investigation may be intuitively appealing, but it does not suffice to assess the validity of either SWH or GWH. In order to explain the diverging results of *Figure 1* and *Table 1*, *panel a*, the sampling technique must be refined.

For closer scrutiny on the role of governmental quality, the whole 2009 sample of 117 countries is divided into three sample portions, denoted A, B, and C, ordered by the *RL* and *GE* quality measures. Thus, sample portion A includes 39 observations of countries with the lowest quality scores, portion B includes 39 countries with medium quality, and portion C includes the remaining 39 countries with the highest quality scores. The resulting categorization into sample portions A, B, and C with reference to *RL* and *GE* is reported country-wise in Appendix 1.

Furthermore, for each sample portion A, B and C, ten sub-portions are constructed to yield 30 sets of observations for both *RL* and *GE*. Thus, in the low quality portion A, the first sub-portion A1 includes the observations from the worst score up to the 30th, the second sub-portion A2 includes the observations from the 2nd to the 31st, and so on. The same applies for sample portions B and C, too. Finally, based on the thus generated sub-portions, sequential estimations are performed for each sample portion (A, B, and C) in the same manner as for the sub-samples of the whole sample. *Figure*s *1.A*, *1.B*, and *1.C* below plot the successive coefficients of corruption (α_3) that result from the sequential estimations of sample portions A, B, and C, respectively. Estimations with respect to *RL* and *GE* are plotted one upon the other within the same co-ordinates.

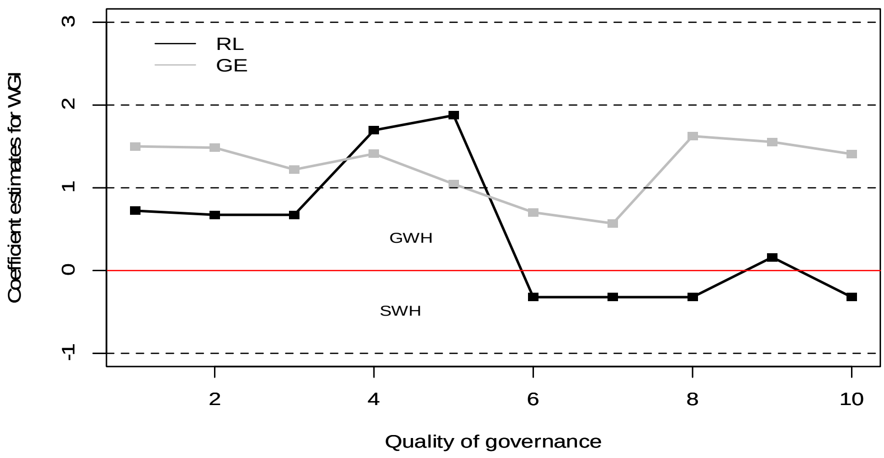

Figure 1.A: Effects of corruption in sample portion A

Figure 1.A shows the marginal impacts of corruption on GDP per capita in countries that record the lowest levels of the quality of governance in terms of *RL* and *GE* (sample portion A). Regarding the *GE* related curve, the estimates of the effect of corruption on GDP growth are systematically positive throughout sub-portions A1–10, with an average of 1.252. The shape of the curve also hints that the positive effect of corruption on GDP growth would diminish as the quality of governance improves. In fact, the average of the coefficients in the first half of the sample portion (A1-5) is 1.332, while the average in the latter half (A6-10) is 1.171. Thus, the strict form of GWH holds. As to *RL*, the test remains more blurry, because the corruption coefficients in sub-portions from A1 to A5 are markedly positive (1.128 in average), but those in sub-portions from A6 to A10 are slightly negative (-0.224 in average). However, as the average over A1–10 is clearly positive (0.452), GWH is considerably supported.

Figure 1.B illustrates the estimation results in sample portion B that is among countries with medium quality of governance.

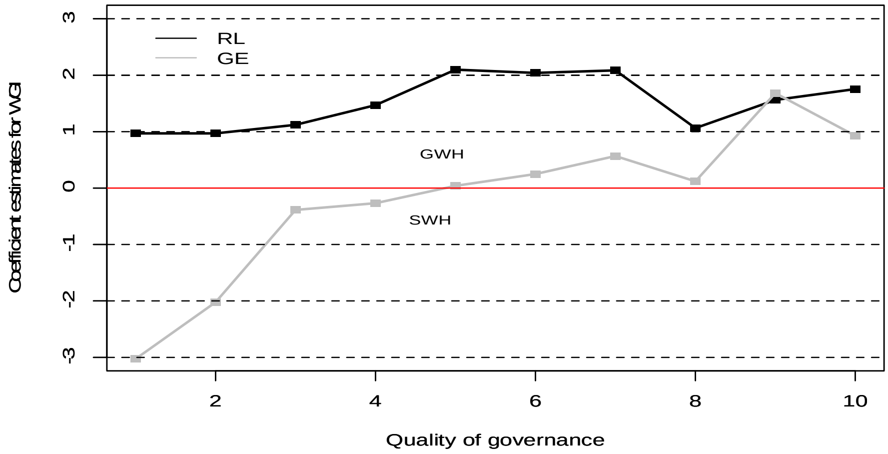

Figure 1.B: Effects of corruption in sample portion B

Figure 1.B shows that, along the *RL* related curve, the coefficients of corruption are always notably positive with the average of 1.513. This speaks for GWH, although the positive effect rather strengthens than diminishes (the B1-5 average is 1.325 while the B6-10 average is 1.700) with the improvement of the quality of governance, which is in contrast with the strict form of GWH. With respect to government efficiency, the test remains inconclusive. The *GE* plots show that corruption seems to cause negative effects on GDP growth throughout the first half of the sample portion (-1.134 in average) and positive effects in the latter half (0.709 in average). The average effect of corruption over the sub-portions B1–10 remains negative (-0.212).

Figure 1.C plots the estimation results among countries with the highest rankings of the quality of governance (sample portion C).

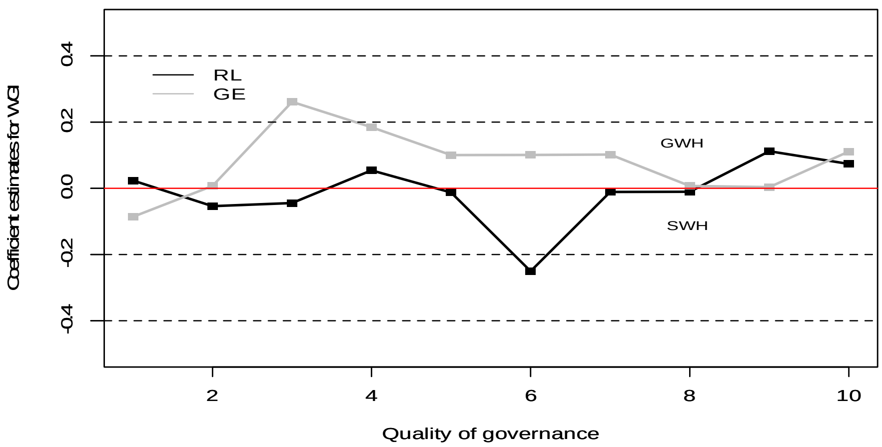

Figure 1.C: Effects of corruption in sample portion C

Figure 1.C shows that the test remains unconvincing, because the effects of corruption are relatively small with both rule of law and government efficiency. The curve based on *RL* now stays mostly in the negative area, and the average impact is -0.012 over sub-portions C1–10 (–0.007 within C1-5, and -0.017 within C6-10). Thus, there is weak support for SWH, but not in its strict form. On the other hand, the *GE* related

coefficients stay more clearly in the positive area, albeit the average effect 0.079 over C1-10 is also very low. The *GE* curve also has a slightly decreasing slope (the averages being 0.093 within C1-5 and 0.065 within C6-10). With respect to *GE*, the weak support comes in favor of GWH, even in its strict form.

The comparison of *Figure*s *1.A*, *1.B* and *1.C* helps to comprehend the SWH-GWH dilemma. Monitoring the average values of the corruption effects through sample portions A, B, and C helps in making qualitative assessments on the issue. That the average of the *RL* related corruption estimates first jumps from 0.452 in sample portion A to 1.513 in portion B, and then falls to -0.012 in portion C suggests an interior solution, that is a certain growth maximizing quality level (possibly within the range of medium quality), after which the beneficial effects of corruption turn detrimental. This accords with Méndez & Sepúlveda (2006), which finds evidence for a non-monotonic relationship between corruption and growth. The respective moves of the *GE* averages are from 1.251 in sample portion A to -0.212 in portion B and to 0.079 in portion C. This seems more like a corner solution with the rough implication that the worse the quality of governance the better corruption serves growth, which is the standard GHW claim of a monotonic relationship between corruption and growth. In any case, the conclusion is that GWH is strongly supported. The conclusion is also in line with the estimation results at $\alpha_4{}^{1}$ 0 in chapter 3.1 (*Table 1, panel a,* the *GE* ad *RL* related columns).

4.2 Capital accumulation

The estimations of equation (2) reported in *Table 2* above indicate that, from the whole sample perspective, the SWH-GWH dilemma remains unresolved, but that the incorporation of *RL* and *GE* yields support for GWH. Following the same 'preliminary investigation' procedure as with *Figure 1* above, *Figure 2* plots the estimates of the effect of corruption on capital accumulation over the whole sample (at β_4=0) with reference to *RL* and *GE*.

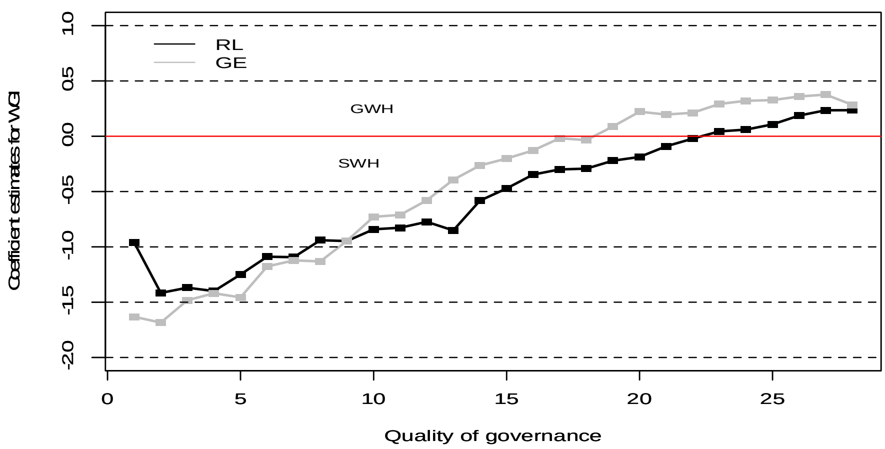

Figure 2: Estimated impact of corruption on capital stock according to *RL* and *GE* in the whole sample

The rising shapes of the two curves in *Figure 2* seem to suggest that the negative effect of corruption becomes less distortive to investments as the quality of governance gets better. In Méon & Sekkat (2005, Figure 2) this is very clear, because the rising *RL* curve always stays in the negative area. However, the *RL* and *GE* curves of *Figure 2* eventually strike through the zero line from below, which reflects the contradicting estimation results of chapter 3.2 (see *Table 2, panel a*). Thus, the result presented by *Figure 2* does not shed light to the SWH-GWH debate, and closer scrutiny is again needed.

In order to dig deeper, the same refinement is done on the sampling technique as in the previous chapter. *Figures 2.A, 2.B* and *2.C* below illustrate the estimation results in the three analogously constructed sample portions, A, B, and C (the categorization of countries is also presented in Appendix 1). *Figure 2.1* presents the results of the sequential estimations in the first sample portion A.

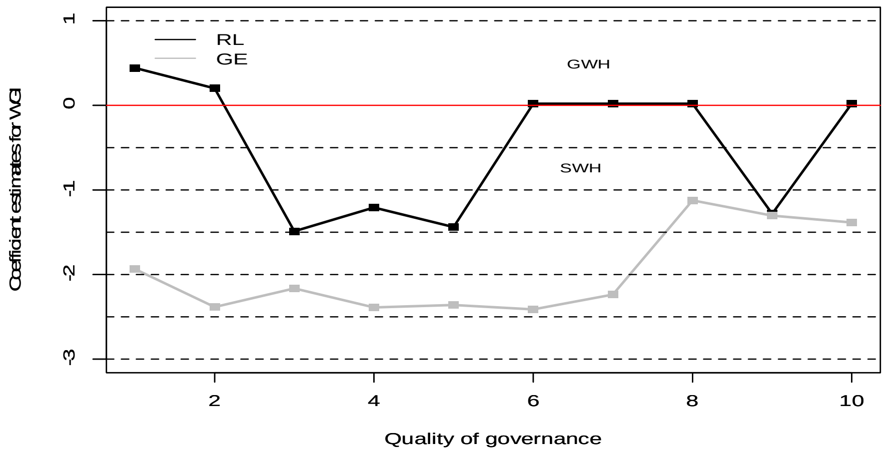

Figure 2.A: Effects of corruption in sample portion A

Figure 2.A plots the effects of corruption on capital stock in countries experiencing the lowest levels of *RL* and *GE*. Practically all estimates are in the negative area saying that the detrimental effects of corruption outweigh the beneficial ones. For *RL*, the average effects of corruption on capital accumulation are -0.698 within A1-5, -0.240 within A6-10, and -0.469 over all sub-portions A1–10. For *GE*, the respective averages are -2.246 within A1-5, -1.692 within A6-10, and -1.969 over the whole sub-portion A. Both observations give support to SWH, and especially so from the part of *GE*, which also depicts a clearly rising trend. *Figure 2.B* presents the estimation results in sample portion B (medium quality).

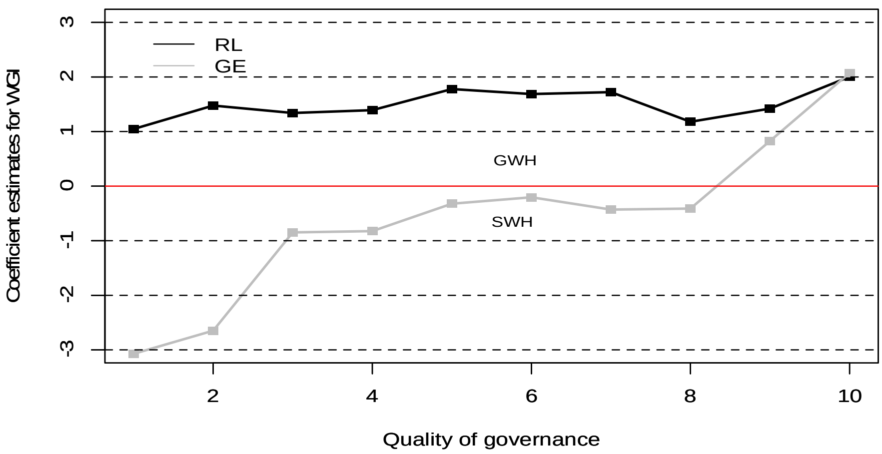

Figure 2.B: Effects of corruption in sample portion B

In *Figure 2.B*, the situation is somewhat changed from that in *Figure 2.A*. The marginal effects of corruption on capital stock with reference to *RL* are now clearly positive, and the average effect over B1-10 is 1.504. Thus, GWH gets support, albeit the curve does not have a decreasing trend (since the average within B1-5 is 1.407, and that within B6-10 is 1.602). With respect to *GE*, the change from sample portion A is a bit smaller. The curve remains mainly in the negative area with a rising trend (the average within B1-5 is -1.543, and that within B6-10 is 0.371) thus speaking in favor of SWH, and the average effect of corruption over B1-10 is now only -0.586. *Figure 2.C* shows the estimation results in sample portion C (high quality of governance).

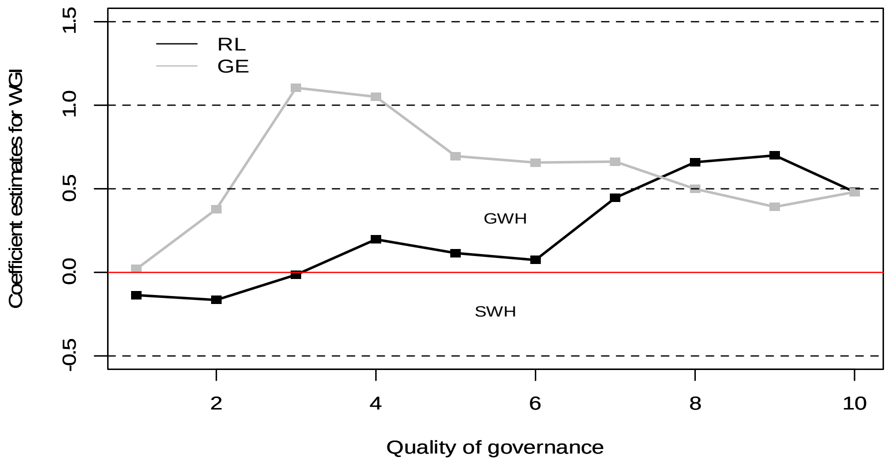

Figure 2.C: Effects of corruption in sample portion C

The first conclusion from *Figure 2.C* is that GWH gets support. The estimated coefficients are relatively small, but they stay mostly in the positive area for both *RL* and *GE*. The evidence from the *GE* graph is particularly convincing, because the coefficient averages are all positive and decline from the first to the second half of portion C (0.650 within C1-5, 0.538 within C6-10, and 0.594 within C1-10). On the other hand, the *RL* curve now strikes through the zero line from below, and the coefficient averages are 0.000 within C1-5, 0.472 within C6-10, and only 0.235 over the whole sample portion C. Thus, GWH gets some support, but the rising trend is in contrast with its strict interpretation.

Comparison of *Figure*s *2.A, 2.B* and *2.C* shows that, when moving from the low quality end towards the high quality end, both *RL* and *GE* related plots shift from the negative to the positive area thus cohering with *Figure 2*. The *GE* average goes from -1.969 in sample portion A through -0.586 in portion B to 0.594 in portion C thus speaking for a SWH-type corner solution. This seems to contradict the conclusion from the estimations in chapter 3.2., but recall that in *Table 2*, the estimate (-0.55) of the respective interaction term (*CPI*GE-09*) is not statistically significant. Thus, there remains some uncertainty in the interpretation of the effect.

Meanwhile, the average of the *RL* plots goes from -0.469 in sample portion A through 1.504 in portion B to 0.235 in portion C. This suggests again an interior solution somewhere between the poorest and the best quality of governance. Thus, the non-monotonic GWH result of Méndez & Sepúlveda (2006) is again supported. This may be due to the claimed positive effects of corruption on the productivity of capital. For example, Leff (1964) claims that licenses tend to get allocated to the most efficient firms, Bardhan (1997) suggests that corruption may pave the way to entrepreneurship, and Beck & Maher (1986) shows that the lowest-cost firm always wins the bribery game. The result sheds some light also on the puzzling result of Méon & Weill (2008) that corruption unambiguously enhances aggregate efficiency. In any case, it can be concluded that GWH cannot be rejected in the context of capital accumulating investments.

5 Conclusions

The paper tests whether the Sanding the Wheels Hypothesis (SWH) or Greasing the Wheels Hypothesis (GWH) is valid in a broad sample of countries. The main idea behind SWH is that corruption causes various kinds of economic distortions that hamper economic growth and development. GWH, on the other hand, is reasoned by possible virtues that corruption may have in bypassing malfunctioning bureaucracy and flawed governance. The paper tackles Méon & Sekkat (2005), which reports unambiguous support for strict SWH that is particularly in those countries with bad governance.

The preliminary estimations show that the average impact of corruption on GDP growth is negative in the whole sample. This would corroborate SWH. On the other hand, the relationship between corruption and capital accumulation remains ambiguous, whereas Méon & Sekkat (2005) finds it also negative.

Adding the interaction between the quality of governance and corruption makes the estimation results differ more drastically from those of Méon & Sekkat (2005). In particular, the negative estimates of the corruption variables turn overall positive, while those of Méon & Sekkat (2005) gain growing negative values. Thus, the interpretation concerning the role of the quality of governance is here reversed. Furthermore, the estimations including rule of law (*RL*) and governmental efficiency (*GE*) give sound support for strict GWH. The results are unambiguous about the positive effect of corruption on growth and investments with both *RL* and *GE*, while the investment effect remains somewhat ambiguous with *GE*.

The recursive tests clarify the picture further. Considering the effect of corruption on GDP growth with respect to *RL* gives reason to argue for an interior solution that is a certain growth maximizing level of governmental quality after which corruption turns from beneficial to detrimental. This is in line with Méndez & Sepúlveda (2006), which finds evidence for a non-monotonic relationship between corruption and growth. The respective analysis concerning *GE* points to a corner solution implying that the worse governmental quality is the better corruption serves growth, which is the strict GHW claim of a monotonic relationship between corruption and growth. The general conclusion is that GWH is supported.

Considering the effects of corruption on capital accumulation with respect to *RL*, an interior GWH solution is again supported, but the results from the *GE* viewpoint are more obscure because of the remaining uncertainty in the estimations. The recursive tests also show that the GWH evidence for capital accumulation appears in better quality countries than that for GDP growth. This hints that governance must be reasonably well functioning for corruption to promote economically rational investments.

All in all, GWH cannot be rejected and corruption cannot be totally banned. Corruption may be harmful as such, but in a second best world with pre-existing distortions it may still be beneficial. Moreover, the paper pinpoints the crucial flaws of governance, namely rule of law and government efficiency. The policy implication is that the effort must be put rather on correcting these deeply rooted distortions by developing legislation and administration than on the plain fight against corruption.

A noteworthy implication for further study is that the answer to the SWH-GWH debate is not only data dependent but that it also necessitates more sophisticated modelling. There must be other channels for corruption to enhance growth besides that through accumulation of physical capital. This may happen, say, via the accumulation of human and social capital, or via other means that improve aggregate efficiency, which is the channel demonstrated by Méon & Weill (2008). These aspects with special emphasis on the non-monotonic interplay between corruption and growth, investments, and aggregate efficiency should be well worthy of deeper analysis.

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Appendix 1: List of countries/territories in the sample and their original governance and corruption scores (Sources: World Bank/Transparency International). Example: "Albania$^{A/B}$" means that this country belongs to sample A according to *RL* categorization, and sample B according to *GE* categorization.

Country/ Territory	*VA09/10/11*	*LV09/10/11*	*GE09/10/11*	*RB09/10/11*	*RL09/10/11*	*WGI09/10/11*	*CPI09/10/11*
Albania$^{A/B}$	0.1265989	-0.0512325	-0.2389934	0.2476654	-0.5325828	-0.4932783	3.2
	0.1120576	-0.1913142	-0.2714275	0.2322520	-0.4357594	-0.4885777	3.3
	0.0503021	-0.2885557	-0.2014628	0.2352432	-0.4853281	-0.6473622	3.1
Argentina$^{A/B}$	0.2447101	-0.2351244	-0.3260052	-0.8462042	-0.7088902	-0.5036001	2.9
	0.3302365	-0.0872479	-0.1901374	-0.7578310	-0.6207297	-0.4135072	2.9
	0.3156912	0.1394252	-0.1365987	-0.7226772	-0.5874928	-0.4011729	3
Australia$^{C/C}$	1.4039058	0.8269657	1.6981726	1.8169361	1.7319517	2.0783314	8.7
	1.4434738	0.8713911	1.7699273	1.6917941	1.7632095	2.0442385	8.7
	1.4773411	0.9297624	1.6979498	1.8523644	1.7414312	2.0801420	8.5
Austria$^{C/C}$	1.4185192	1.1659884	1.6736235	1.4648699	1.7870105	1.7640095	7.9
	1.4658701	1.1237210	1.8381406	1.4662598	1.8057999	1.6266258	7.9
	1.4326834	1.1786493	1.6122803	1.3949937	1.8107110	1.4448040	7.8
Bahrain$^{B/B}$	-0.7990285	-0.1627256	0.4961031	0.7138539	0.5532317	0.2415089	5.1
	-0.9716967	-0.5065861	0.4839480	0.7320066	0.4800778	0.2490037	4.9
	-1.2221702	-0.9601011	0.5467648	0.7432290	0.3918324	0.2363450	5.1
Bangladesh$^{A/A}$	-0.3013690	-1.5410822	-0.7869006	-0.8458747	-0.7737407	-1.0272481	2.4
	-0.2811644	-1.3987305	-0.7466357	-0.8340193	-0.7863807	-1.0232698	2.4
	-0.3225063	-1.3929703	-0.7585509	-0.8013586	-0.7117915	-1.0468478	2.7
Barbados$^{C/C}$	1.2013690	1.0644525	1.5051937	0.5313724	0.9734522	1.3341261	7.4
	1.2091648	1.0938162	1.4134511	0.4500823	1.0438891	1.4361289	7.8
	1.1869115	1.2782853	1.4641999	0.6013535	1.0412560	1.7647067	7.8
Belgium$^{C/C}$	1.3646447	0.7921069	1.5870964	1.3222391	1.3555488	1.4279661	7.1
	1.3819248	0.7815902	1.5815514	1.2903933	1.3698656	1.4940935	7.1
	1.3432687	0.9346927	1.6597028	1.2445455	1.4036214	1.5597021	7.5
Belize$^{B/B}$	0.7480527	0.0278336	-0.4726605	-0.4698008	-0.3753379	-0.0406341	...
	0.6757314	0.0636423	-0.4396821	-0.4459726	-0.3588986	-0.0817510	…
	0.6749200	0.1463829	-0.3610856	-0.5359116	-0.4933625	-0.2602550	…
Benin$^{A/A}$	0.3265036	0.3752901	-0.5561426	-0.3287827	-0.6733479	-0.6727116	2.9
	0.2887886	0.2222993	-0.5782274	-0.3235309	-0.7006985	-0.7376142	2.8
	0.1368682	0 .2933429	-0.5323104	-0.3348654	-0.7134449	-0.6341435	3
Bolivia$^{A/A}$	-0.0306159	-0.5297799	-0.5928143	-0.8557431	-1.1375538	-0.6312029	2.7
	-0.0739392	-0.4445233	-0.5030620	-0.7869012	-1.0538486	-0.4423157	2.8
	-0.1019865	-0.4437194	-0.4633995	-0.7417715	-1.0085624	-0.5339831	2.8
Botswana$^{C/B}$	0.4213548	0.9319792	0.4829932	0.4844399	0.6548729	0.9195151	5.6
	0.4420506	0.9607075	0.4635652	0.4561550	0.6662079	1.0033346	5.8
	0.3958006	1.0505356	0.4619562	0.5003294	0.6650270	0.9882779	6.1
Brazil$^{B/B}$	0.4865210	0.1643639	-0.0956505	0.1095366	-0.2171707	-0.1167837	3.7
	0.5297380	0.0057122	-0.0393811	0.1644911	-0.0037492	-0.0006795	3.7
	0.4735872	-0.1363690	-0.1178521	0.1771274	-0.0058928	0.1456659	3.8
Brunei Darussalam$^{C/C}$	-0.7459926	1.3635690	0.9411171	1.1039384	0.7951535	1.0202091	5.5
	-0.6514749	1.2403291	0.8992627	1.1234875	0.7929224	0.8947635	5.6
	-0.5995606	1.0950062	0.8872761	1.1760467	0.8713961	0.8751502	5.2
Bulgaria$^{B/B}$	0.5557074	0.3184204	0.1613308	0.6620950	-0.0738960	-0.2471227	3.8
	0.5241060	0.3274322	0.1104217	0.6410076	-0.1039492	-0.2069802	3.6
	0.4395235	0.2790123	0.1086238	0.5372283	-0.1367129	-0.2250355	3.3
Burundi$^{A/A}$	-0.7096075	-1.2675714	-1.0294101	-1.1479775	-1.1643437	-1.0675523	1.8
	-0.9434164	-1.5960978	-1.1004065	-1.1045552	-1.1903488	-1.1056302	1.8
	-0.9448452	-1.7848533	-1.0856076	-0.9998989	-1.1329580	-1.1349526	1.9
Cambodia$^{A/A}$	-0.9112024	-0.5873427	-0.9102455	-0.4736017	-1.0856301	-1.1589940	2
	-0.9260100	-0.5417823	-0.9242123	-0.4618946	-1.0895602	-1.2323845	2.1
	-0.9107930	-0.3272548	-0.8502222	-0.5705897	-1.0223165	-1.2182861	2.1
Cameroon$^{A/A}$	-1.0619175	-0.4820484	-0.8185738	-0.7398507	-1.1152772	-0.9223456	2.2
	-1.0797361	-0.7268565	-0.8750547	-0.7257782	-1.0523128	-0.9846665	2.2
	-1.0459890	-0.6613228	-0.8739234	-0.7898504	-1.0571951	-1.0741826	2.5
Canada$^{C/C}$	1.4285032	1.0967020	1.7523437	1.6972243	1.8058612	2.0833239	8.7
	1.3756983	0.9037905	1.7882252	1.6895374	1.8098323	2.0968079	8.9
	1.4056061	1.0611191	1.7779760	1.6847854	1.7429635	1.9993255	8.7
Central African Republic$^{A/A}$	-1.0063691	-1.8827085	-1.4225785	-1.2534358	-1.3206812	-0.9074397	...
	-1.1234595	-2.0119109	-1.3902735	-1.1516927	-1.2939292	-0.8361163	…
	-1.1076943	-1.7849242	-1.2779517	-1.1786459	-1.2720955	-0.8436344	…
Chile$^{C/C}$	1.0088415	0.5927134	1.2306654	1.4800742	1.2657794	1.3502798	6.7
	1.0915977	0.6748260	1.2611789	1 .4562134	1.3221518	1.4859126	7.2
	1.0755788	0.4591399	1.2561986	1.4758220	1.3580543	1.5230313	7.2
China$^{B/B}$	-1.6571604	-0.428204	0.1134911	-0.2016862	-0.3218533	-0.5433449	3.6
	-1.6316169	-0.6571777	0.1021213	-0.2187211	-0.3288297	-0.5958467	3.5
	-1.5832601	-0.6063860	0.0954512	-0.2098415	-0.3912694	-0.5554175	3.6
Colombia$^{B/B}$	-0.1599145	-1.8311153	-0.2289401	0.1519475	-0.4273221	-0.3054511	3.7
	-0.1538632	-1.5323072	-0.0428464	0.2582385	-0.3454352	-0.4086259	3.5
	-0.0902152	-1.2654761	0.0639427	0.3679736	-0.2860052	-0.3001152	3.4

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Congo, Republic of [A/A]	-1.0994035 -1.0575951 -1.1045879	-0.2774469 -0.3304975 -0.3616942	-1.2350144 -1.2339884 -1.1966785	-1.2816084 -1.2672029 -1.2594231	-1.1885554 -1.1833568 -1.1615811	-1.1754363 -1.1149697 -1.0782952	1.9 2.1 2.2
Costa Rica[B/B]	0.9990097 1.0385227 1.0398352	0.5718901 0.6851660 0.6851660	0.3287033 0.3287033 0.3141529	0.3431884 0.4563459 0.5042729	0.5342077 0.5342077 0.4882818	0.4232355 0.7057902 0.6478212	5.3 5.3 4.8
Côte d'Ivoire[A/A]	-1.1111903 -1.0966356 -1.1281301	-1.2847657 -1.5658675 -1.4045841	-1.0814440 -1.2602875 -1.1205446	-0.9499763 -0.9124377 -0.8580213	-1.2628682 -1.2363500 -1.2898006	-1.0819079 -1.1378797 -1.0362312	2.1 2.2 2.2
Cyprus[C/C]	1.0779166 1.0779166 1.0220048	1.0532475 0.3792575 0.5983886	0.5983886 1.4305818 1.5288684	1.5644798 1.3739506 1.2373296	1.1907930 1.1959749 1.0531340	0.9328679 1.0047795 0.8871522	6.6 6.3 6.3
Democratic Republic of the Congo[A/A]	-1.4474422 -1.4446722 -1.5156416	-1.9873279 -2.2271516 -2.2369108	-1.7051832 -1.7349410 -1.6733869	-1.5291693 -1.5823006 -1.5198329	-1.6297209 -1.6121451 -1.6061502	-1.3634680 -1.4180767 -1.3963909	1.9 2 2
Denmark[C/C]	1.5710489 1.5820599 1.5977822	0.9731678 1.0307446 1.1006886	2.2292788 2.0936598 2.1109986	1.8962008 1.8841549 1.9114117	1.9211004 1.8966164 1.9284000	2.5193676 2.4135639 2.4525077	9.3 9.3 9.4
Dominican Republic[A/A]	0.0574986 0.0341533 0.0555231	-0.0104966 -0.0687154 -0.0133375	-0.6104328 -0.6614285 -0.5848188	-0.1913703 -0.1452541 -0.1883350	-0.7632327 -0.8022168 -0.7550654	-0.7230680 -0.8076913 -0.7643871	3 3 2.6
Ecuador[A/A]	-0.2759430 -0.2602430 -0.3241090	-0.6832963 -0.6215849 -0.7144565	-0.7777221 -0.7169513 -0.5865280	-1.2794593 -1.1602264 -1.0240697	-1.2521972 -1.2072801 -1.2134237	-0.8868925 -0.8613360 -0.7939191	2.2 2.5 2.7
Egypt[B/B]	-1.1214361 -1.1470557 -1.1288076	-0.6194138 -0.9085869 -1.4470433	-0.2733011 -0.3763946 -0.5360022	-0.1875817 -0.1565823 -0.3265258	-0.0598440 -0.1153314 -0.4003763	-0.4187502 -0.5498520 -0.6599932	2.8 3.1 2.9
El Salvador[A/B]	0.0473479 0.0543115 0.0170261	-0.0213150 0.0557529 0.1141213	-0.0189458 0.0024754 -0.1073956	0.3532253 0.3757462 0.4876372	-0.8004014 -0.8674402 -0.7573447	-0.1957092 -0.2338723 -0.2115938	3.4 3.6 3.4
Fiji[A/A]	-0.7801483 -1.0011466 -0.9808722	-0.2578577 -0.1539511 -0.0513160	-0.9087567 -0.7270969 -0.7111564	-0.9533885 -0.6693059 -0.5016015	-0.7563208 -0.8466668 -0.8206864	-0.7396603 -0.8490893 -0.4440961	... … …
Finland[C/C]	1.4948029 1.5234532 1.5480285	1.4251066 1.3926494 1.3740606	2.2379028 2.2452116 2.2583038	1.8327659 1.8868588 1.8293492	1.9741289 1.9767785 1.9556539	2.3030128 2.1819584 2.2187564	8.9 9.2 9.4
France[C/C]	1.2433812 1.2017921 1.1666493	0.4747641 0.6707894 0.5933103	1.4931977 1.4474401 1.3723990	1.2131203 1.3076065 1.1492563	1.4274542 1.5115292 1.4397891	1.4174041 1.4359748 1.5219893	6.9 6.8 7
Gabon[A/A]	-1.0006707 -0.8876721 -0.9331597	0.1248124 0.2979316 0.3870336	-0.7543981 -0.7833404 -0.8040120	-0.5945622 -0.5656571 -0.5590690	-0.5492871 -0.5144128 -0.4489677	-0.9416733 -0.7803832 -0.7862082	2.9 2.8 3
Gambia[B/A]	-1.0126047 -1.0851955 -1.2215512	0.1437357 0.0797288 0.0067038	-0.6277015 -0.6559684 -0.6055374	-0.3221126 -0.3831659 -0.2675029	-0.4433269 -0.5105978 -0.5060119	-0.5638038 -0.5596552 -0.4987613	2.9 3.2 3.5
Germany[C/C]	1.3453322 1.3102837 1.3659296	0.8345506 0.7848618 0.8377121	1.5867574 1.5659327 1.5477759	1.5257831 1.5775310 1.5556707	1.6397396 1.6158680 1.6072758	1.7230968 1.7368941 1.7091935	8 7.9 8
Ghana[B/B]	0.4868556 0.4927358 0.4588853	0.0359192 0.0237016 0.1573364	-0.0378100 -0.0392845 -0.0515221	0.0901794 0.1238879 0.1312108	-0.0768065 -0.0630011 -0.0386389	0.0313423 0.0597239 0.0478245	3.9 4.1 3.9
Greece[C/C]	0.8620226 0.8796460 0.8023688	-0.2239698 -0.1317059 -0.0997927	0.6146594 0.5479233 0.5023763	0.8177834 0.6426160 0.5057075	0.6193619 0.6050667 0.5480496	0.0077841 -0.1581794 -0.1846279	3.8 3.5 3.4
Guatemala [A/A]	-0.2740446 -0.3344646 -0.3411244	-0.9443116 -0.8731414 -0.7655390	-0.6938183 -0.6987481 -0.6994472	-0.1182254 -0.1302820 -0.1119975	-1.0729901 -0.9988156 -1.0580755	-0.4781287 -0.4812993 -0.4700800	3.4 3.2 2.7
Honduras[A/A]	-0.5511761 -0.5133938 -0.4874289	-0.3304113 -0.5377914 -0.4262376	-0.6662774 -0.6403038 -0.5489020	-0.2642721 -0.2069361 -0.1155411	-0.9217928 -0.8852391 -0.9237212	-0.8688748 -0.8656970 -0.7961842	2.5 2.4 2.6
Hong Kong[C/C]	0.4670424 0.5050491 0.5659192	0.9268124 0.8849168 0.9186050	1.7438263 1.6971417 1.6677237	1.8526358 1.9080837 1.8002624	1.4830129 1.5390791 1.5501148	1.8965748 1.9741591 1.8608856	8.2 8.4 8.4
Hungary[C/C]	0.9028832 0.9004918 0.8471132	0.5171686 0.6704437 0.7347599	0.6768618 0.6655406 0.6751831	1.0803200 1.0172439 1.0293837	0.7586851 0.7475842 0.7449156	0.3412201 0.2524087 0.3192020	5.1 4.7 4.6
Iceland[C/C]	1.4445850 1.4816958 1.4463238	1.1761394 1.0095074 1.2309099	1.6547380 1.5928989 1.5765985	1.0047094 0.8836492 1.0090428	1.7053052 1.6975963 1.6767243	2.0569424 1.9374301 1.9461077	8.7 8.5 8.3
India[B/B]	0.4501788 0.4279142 0.4208199	-1.3283314 -1.2331525 -1.2961640	-0.0052090 0.0169612 -0.0050298	-0.3032303 -0.3691800 -0.3349846	0.0234900 -0.0413999 -0.1119011	-0.4773709 -0.5128427 -0.5728084	3.4 3.3 3.1
Indonesia[A/B]	-0.0336922 -0.0711832 -0.0376777	-0.7585163 -0.8538007 -0.7652453	-0.2765682 -0.1974721 -0.2488120	-0.3330929 -0.3946484 -0.3305923	-0.5951361 -0.6402983 -0.6077508	-0.8158257 -0.7454031 -0.6799344	2.8 2.8 3

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Iran[A/A]	-1.5533038	-1.5521520	-0.5738470	-1.7304923	-0.9443582	-0.8610210	1.8
	-1.5747575	-1.6201318	-0.4750221	-1.6950126	-0.9839990	-0.9913517	2.2
	-1.5499902	-1.4228550	-0.4395461	-1.5072622	-0.9405436	-0.9245688	2.7
Iraq[A/A]	-1.1000623	-2.1856992	-1.2020230	-1.0060865	-1.7741949	-1.3922886	1.5
	-1.0560930	-2.2555389	-1.2208051	-1.0501729	-1.6151213	-1.3101540	1.5
	-1.1351606	-1.8426450	-1.1507735	-1.0929888	-1.5143709	-1.2072050	1.8
Ireland[C/C]	1.3723953	1.0224077	1.3375402	1.7004084	1.7419176	1.7683807	8
	1.3430035	0.9790665	1.3363370	1.6147474	1.7683802	1.6985143	8
	1.3197278	0.9313718	1.4504491	1.5924390	1.7652595	1.5406835	7.5
Israel[C/C]	0.5486457	-1.6230447	1.2601152	1.1089854	0.8225908	0.7495756	6.1
	0.5628886	-1.3221223	1.3679240	1.2249543	0.8987065	0.6680691	6.1
	0.6453261	-1.1924403	1.3295308	1.3225425	0.9992683	0.7123726	5.8
Italy[C/C]	1.0250650	0.3405119	0.4246122	0.9451221	0.3509370	0.1251719	4.3
	0.9516773	0.4740656	0.4462603	0.8921211	0.3782627	-0.0049817	3.9
	0.8983953	0.5057836	0.3793640	0.7137939	0.4206047	0.0816871	3.9
Jamaica[B/B]	0.5482289	-0.3465410	0.2093722	0.2750856	-0.4843425	-0.4363029	3
	0.4154015	-0.4060291	0.1968695	0.2806513	-0.4989186	-0.3756710	3.3
	0.4269242	-0.0775001	0.2161098	0.3011560	-0.4248538	-0.2943780	3.3
Japan[C/C]	1.0175809	0.9363423	1.4609647	1.0902099	1.2970616	1.3718732	7.7
	1.0367649	0.8543843	1.5222183	1.0257090	1.3257570	1.5730450	7.8
	1.0700187	0.9843354	1.4690600	1.0800086	1.2954177	1.5677943	8
Jordan[B/B]	-0.7830679	-0.3559724	0.2810308	0.3068661	0.2801753	0.2201118	5
	-0.8021092	-0.3100980	0.1317833	0.2504871	0.2026056	0.0647471	4.7
	-0.7949714	-0.5165318	0.0952507	0.3006329	0.2597206	0.0956884	4.5
Kenya[A/A]	-0.3371308	-1.4302234	-0.6028342	-0.1335880	-1.0506408	-1.0819967	2.2
	-0.2254792	-1.1697114	-0.5428418	-0.0742741	-0.9934090	-0.9357057	2.1
	-0.2748671	-1.2424445	-0.5733617	-0.2076156	-0.9522542	-0.9502148	2.2
Korea,	0.6930413	0.3797037	1.1103863	0.8392624	0.9777076	0.4832886	5.5
Republic of [C/C]	0.7299681	0.2860971	1.2173247	0.9371671	0.9900965	0.4016645	5.4
	0.7165270	0.3890756	1.2590115	0.9921059	1.0229904	0.4612303	5.4
Kuwait[C/B]	-0.4601744	0.3374360	0.2136727	0.1579301	0.6131631	0.4150271	4.1
	-0.5063927	0.4375881	0.1786713	0.1699209	0.6034204	0.3997512	4.5
	-0.5389334	0.2947349	0.0214070	0.0913686	0.5455459	0.1300760	4.6
Laos[A/A]	-1.6441149	-0.1710512	-0.9567790	-1.0562578	-1.0047147	-1.2610820	2
	-1.6191784	-0.2731952	-0.8730940	-1.0125058	-0.9241769	-1.2068852	2.1
	-1.6154447	-0.0595255	-0.8486622	-0.9748938	-0.9466539	-1.1868718	2.2
Lesotho[B/B]	-0.1232531	0.3391543	-0.2895481	-0.6225507	-0.2305605	0.1598934	3.4
	-0.1398333	0.4749986	-0.3154894	-0.5967490	-0.3004618	0.1781596	3.5
	-0.1199080	0.3765703	-0.2860415	-0.6054568	-0.2721626	0.1752417	3.5
Liberia[A/A]	-0.2043335	-1.0754026	-1.2388153	-1.1912096	-1.0811713	-0.5627105	3.1
	-0.2592304	-0.4582324	-1.2697161	-1.0537198	-1.0117243	-0.5278384	3.3
	-0.3097794	-0.4238356	-1.2519524	-1.0947736	-0.9599565	-0.6157335	3.2
Luxembourg[C/C]	1.5357954	1.4236755	1.7454439	1.6586436	1.8174391	1.9853389	8.2
	1.5591799	1.4414994	1.7103219	1.6930838	1.8314228	2.0631206	8.5
	1.5945729	1.3145372	1.7373408	1.8605009	1.8017768	2.1677024	8.5
Macao[C/C]	0.5751461	0.6003279	1.3180643	1.2706809	0.6840381	0.1650118	5.3
	0.6139959	0.5491933	1.3247179	1.3388552	0.7041326	0.4284875	5.3
	0.6020889	0.6063449	1.3086364	1.3288425	0.6901117	0.4634080	5.1
Malawi[B/B]	-0.1617927	0.0503393	-0.4657814	-0.4418672	-0.1233763	-0.3824303	3.4
	-0.2053070	0.0556567	-0.4204137	-0.5756891	-0.1423996	-0.4574005	3.4
	-0.2646383	-0.0725231	-0.4417168	-0.7010721	-0.1787400	-0.3831895	3
Malaysia[B/C]	-0.4865076	-0.0702237	0.9952234	0.3075672	0.4878837	-0.0311586	4.5
	-0.4771774	0.1225886	1.1289255	0.5946635	0.5263307	0.1330046	4.4
	-0.4416501	0.0809358	1.0285365	0.5875102	0.5199782	0.0513854	4.3
Maldives[B/B]	-0.0846754	-0.2176021	-0.4534166	-0.4132637	-0.1684603	-0.6813964	2.5
	-0.0991614	-0.1295024	-0.2125017	-0.3957663	-0.3289847	-0.5262160	2.3
	-0.2046117	-0.2061499	-0.3074980	-0.4023034	-0.5726328	-0.5248277	2.5
Mali[B/A]	0.0418586	-0.0780520	-0.7896736	-0.3906196	-0.3503318	-0.6356813	2.8
	0.1343904	-0.2077975	-0.8399364	-0.4792355	-0.4416826	-0.6507666	2.7
	0.1544365	-0.6787787	-0.7844777	-0.3825396	-0.4946084	-0.5570901	2.8
Malta[C/C]	1.1400840	1.2093473	1.1685818	1.3697855	1.4817337	0.8343579	5.2
	1.1551215	1.2118144	1.1968619	1.4295687	1.4366155	0.8550025	5.6
	1.1324293	1.0386052	1.2083010	1.3338224	1.3004140	0.8343635	5.6
Mauritania[A/A]	-0.9651089	-0.8776072	-0.8825936	-0.6714248	-0.7860354	-0.5560612	2.5
	-0.9511033	-1.0796040	-0.9629297	-0.8203942	-0.8679195	-0.6710209	2.3
	-0.9416400	-1.1686424	-0.9390950	-0.7711794	-0.8534024	-0.4536250	2.4
Mauritius[C/C]	0.8137077	0.6610594	0.7623692	0.8697070	0.9520711	0.6297062	5.4
	0.7794566	0.5828140	0.8483137	0.8979968	0.8628253	0.6527594	5.4
	0.7771756	0.9369315	0.8434717	0.8491420	0.8962007	0.5942903	5.1
Mongolia[B/A]	0.0914170	0.6015124	-0.6582975	-0.2767553	-0.2760956	-0.7553092	2.7
	0.0445994	0.5904701	-0.5723255	-0.2252177	-0.3861205	-0.7301729	2.7
	0.0032771	0.5998401	-0.5784618	-0.2047316	-0.2993519	-0.6756805	2.7
Morocco[B/B]	-0.7780303	-0.4104391	-0.1314648	-0.0483751	-0.1924256	-0.3091093	3.4
	-0.7279255	-0.3830172	-0.0905928	-0.0683286	-0.1568030	-0.1752992	3.4
	-0.7362639	-0.3945543	-0.1271821	-0.1058024	-0.2151445	-0.3974696	3.4

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Mozambique[A/A]	-0.1059374	0.5895403	-0.5438292	-0.3867262	-0.5921087	-0.4210197	2.5
	-0.1113841	0.3437868	-0.5735178	-0.3907478	-0.4712031	-0.4291821	2.7
	-0.1908674	0.2955192	-0.6263377	-0.4234240	-0.5730944	-0.5002659	2.7
Mexico[A/B]	0.1752418	-0.6986821	0.1632934	0.2344021	-0.6062816	-0.3010740	3.4
	0.1513805	-0.7387213	0.1442436	0.2619131	-0.5777440	-0.3702896	3.1
	0.0946272	-0.6825855	0.3070609	0.292824	-0.5533280	-0.4013237	3
Nepal[A/A]	-0.4727785	-1.6230992	-0.9369090	-0.7006593	-0.9031954	-0.6517906	2.3
	-0.4813211	-1.5961890	-0.8606199	-0.7432949	-1.0081009	-0.6483138	2.2
	-0.4828552	-1.4229489	-0.8800888	-0.7222880	-0.9499320	-0.7403808	2.2
Niger[A/A]	-0.7843500	-1.1566997	-0.6611185	-0.4824241	-0.5230668	-0.6085837	2.9
	-0.6682391	-1.1754146	-0.6656486	-0.5106096	-0.5205799	-0.6676175	2.6
	-0.2984977	-0.8717520	-0.6219311	-0.5252165	-0.4066666	-0.6044686	2.5
Namibia[B/B]	0.3741449	0.9039065	0.1306594	0.1031179	0.2170364	0.2485821	4.5
	0.3531342	0.8050329	0.1103805	0.1382214	0.1941859	0.3176178	4.4
	0.3475813	0.8891928	0.0755580	0.0834216	0.1668191	0.3014101	4.8
Netherlands[C/C]	1.4928393	0.9086835	1.7442498	1.7112457	1.8049879	2.1664578	8.9
	1.4867756	0.9138274	1.7281209	1.7368314	1.8103764	2.1792504	8.8
	1.5794039	1.0962277	1.7890534	1.8158133	1.8135691	2.1564683	8.9
Norway[C/C]	1.5790435	1.2433767	1.8185722	1.4701670	1.8899805	1.9959253	8.6
	1.6371994	1.3077529	1.8625810	1.5141283	1.9172503	2.1022293	8.6
	1.6708436	1.3275432	1.8402558	1.6020971	1.8931428	2.1738202	9
New Zealand[C/C]	1.5105080	1.0336545	1.8475948	1.8326137	1.9363251	2.4622020	9.4
	1.5458669	1.2233320	1.8078824	1.8080502	1.8686597	2.3962943	9.3
	1.6203254	1.3741648	1.8807224	1.9670571	1.9072638	2.3375377	9.5
Pakistan[A/A]	-0.8999985	-2.6269967	-0.7785802	-0.5533440	-0.8419176	-1.0442645	2.4
	-0.8428250	-2.6733784	-0.7592706	-0.5832578	-0.7392923	-1.0711113	2.3
	-0.8729264	-2.8120801	-0.8107213	-0.6267332	-0.9094912	-1.0526592	2.5
Panama[B/B]	0.5809519	0.0388166	0.1426440	0.3766306	-0.1262950	-0.3181698	3.4
	0.5239200	-0.1102497	0.1322316	0.3785193	-0.1027193	-0.3516879	3.6
	0.5171696	-0.0277646	0.0944815	0.4266677	-0.0068184	-0.3414560	3.3
Paraguay[A/A]	-0.1728591	-0.8701075	-0.9225848	-0.4208652	-0.9561554	-0.8290727	2.1
	-0.1164800	-0.8100618	-0.9368197	-0.3356148	-0.9103018	-0.7418506	2.2
	-0.1108857	-0.6673431	-0.8353350	-0.3489732	-0.8473799	-0.7132877	2.2
Peru[A/B]	0.0405872	-1.1809401	-0.4224070	0.4013555	-0.6627456	-0.3421613	3.7
	0.0664036	-0.9768856	-0.2031367	0.4607087	-0.6002165	-0.2504282	3.5
	0.0915839	-0.7377773	-0.1456786	0.4768813	-0.6099757	-0.2493100	3.4
Philippines[A/B]	-0.0281591	-1.7127827	-0.0337626	-0.0924322	-0.5989732	-0.7717154	2.4
	-0.0584959	-1.6319936	-0.0175709	-0.2168983	-0.5839188	-0.8036748	2.4
	-0.0416617	-1.3846995	0.0843841	-0.2096517	-0.5379927	-0.6965103	2.6
Poland[B/C]	1.0145409	0.9045516	0.5235112	0.9529154	0.5966590	0.3701248	5
	1.0255683	0.9877911	0.6371619	0.9854769	0.6578375	0.4131818	5.3
	1.0148867	1.0569467	0.6219883	0.9354750	0.7513222	0.4851290	5.5
Portugal[C/C]	1.1253708	0.7636345	1.1591845	0.9715673	1.0464419	1.0386799	5.8
	1.0989267	0.7019104	1.0217183	0.7215690	1.0432232	1.0305711	6
	1.0981141	0.7215386	0.9587681	0.6168154	1.0260728	1.0842155	6.1
Qatar[C/C]	-0.8881107	1.2086905	0.9966018	0.6895436	1.0112191	1.7228492	7
	-0.8943258	1.1187074	0.8911757	0.6059891	0.9456219	1.5686968	7.7
	-0.9628679	1.1672480	0.7767179	0.4911172	0.8420267	1.0824186	7.2
Romania[B/B]	0.4582098	0.3525046	-0.3559274	0.5937399	0.0344668	-0.2666863	3.8
	0.4227225	0.2461356	-0.2508709	0.6404803	0.0356661	-0.2154220	3.7
	0.3655299	0.1684590	-0.3122313	0.6569408	0.0476200	-0.1902079	3.6
Rwanda[B/B]	-1.2845263	-0.4730251	-0.1686910	-0.3102291	-0.4937599	0.1330752	3.4
	-1.3106880	-0.1981866	-0.0472604	-0.1800414	-0.3021875	0.4625661	4
	-1.3083124	-0.1354904	0.0744672	-0.1263599	-0.3082196	0.4285937	5
Saudi Arabia[B/B]	-1.7750653	-0.5073685	-0.0647715	0.1795409	0.1597855	-0.0107539	4.3
	-1.7361354	-0.2239489	0.0313610	0.1833673	0.2595771	0.0566928	4.7
	-1.8618862	-0.4605008	-0.3214393	0.0288021	0.1356633	-0.3749554	4.4
Senegal[B/B]	-0.3299900	-0.1968649	-0.4958516	-0.2854215	-0.3705505	-0.5280863	3
	-0.3170279	-0.4271116	-0.5575702	-0.2701873	-0.4028072	-0.6938685	2.9
	-0.2690743	-0.2964352	-0.4539729	-0.2078767	-0.4879172	-0.5362682	2.9
Sierra Leone[A/A]	-0.2638892	-0.2965677	-1.2154467	-0.7773705	-0.9188638	-0.9385310	2.2
	-0.1842605	-0.2405907	-1.2099461	-0.7248363	-0.9558222	-0.7731903	2.4
	-0.2362301	-0.1701631	-1.1884043	-0.7022125	-0.8715485	-0.8220255	2.5
Singapore[C/C]	-0.2374846	1.1424515	2.2814519	1.8009041	1.6040557	2.2525894	9.2
	-0.1982065	1.1391284	2.2554316	1.7998013	1.6834772	2.2129163	9.3
	-0.0730917	1.1795293	2.1665091	1.7968435	1.7256305	2.1231172	9.2
South Africa[B/B]	0.5520859	-0.1132230	0.4755506	0.4011851	0.0929922	0.1434054	4.7
	0.5833416	-0.0189985	0.3926810	0.3576122	0.1075497	0.0927990	4.5
	0.5764389	0.03166339	0.4112215	0.4053214	0.1264774	0.0340962	4.1
Spain[C/C]	1.1768784	-0.4656445	0.9342550	1.1753592	1.1327881	0.9953140	6.1
	1.1153502	-0.2891529	0.9894321	1.1576062	1.1582577	1.0132770	6.1
	1.0746124	0.0389475	1.0318841	1.0660287	1.1763495	1.0544729	6.2
Sri Lanka[B/B]	-0.4861460	-1.3473309	-0.1225255	-0.2638235	-0.0674764	-0.3709918	3.1
	-0.5187926	-0.9231097	-0.1833546	-0.2047123	-0.0755485	-0.3992263	3.2
	-0.5537244	-0.6991382	-0.1016116	-0.1063439	-0.0713073	-0.3738390	3.3

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Sudan[A/A]	-1.6643401 -1.7225908 -1.7681543	-2.6518142 -2.6600205 -2.5291311	-1.2673655 -1.3672014 -1.3903954	-1.2531358 -1.3311796 -1.2971476	-1.2344808 -1.2961812 -1.2214777	-1.2148141 -1.2566750 -1.2285052	1.5 1.6 1.6
Swaziland[A/A]	-1.2043305 -1.2514952 -1.2414234	0.0063353 -0.0444697 -0.4925916	-0.7474192 -0.5177149 -0.6954318	-0.5538121 -0.6022917 -0.6343458	-0.6139146 -0.4914311 -0.4560793	-0.1962115 -0.1673406 -0.2933010	3.6 3.2 3.1
Sweden[C/C]	1.5765284 1.5780230 1.6519677	1.0617384 1.0889314 1.2262988	2.0469758 2.0073316 1.9676430	1.6712903 1.6679399 1.9125772	1.9657564 1.9625309 1.9479030	2.2908287 2.3189690 2.2217955	9.2 9.2 9.3
Switzerland[C/C]	1.5857894 1.6287109 1.6309775	1.2770891 1.2282150 1.2840389	1.9642933 1.8869262 1.8671767	1.5782784 1.6488376 1.6394214	1.7552704 1.7663342 1.7375602	2.0933568 2.0986828 2.0514028	9 8.7 8.8
Syrian Arab Republic[B/A]	-1.6393491 -1.6395100 -1.7497409	-0.4929013 -0.8104290 -2.0119750	-0.5878275 -0.6029238 -0.4972777	-0.9520425 -0.8882102 -0.9289920	-0.4863683 -0.5048863 -0.6895985	-1.0677574 -1.0819880 -1.0453988	2.6 2.5 2.6
Taiwan[C/C]	0.8211583 0.8291041 0.8416095	0.5330451 0.8359737 0.9386801	1.1862632 1.1944255 1.1543662	1.0666490 1.1413086 1.1405036	0.9251635 1.0153894 1.0458228	0.5991090 0.7168822 0.8649786	5.6 5.8 6.1
Tanzania[B/A]	-0.1580806 -0.1315183 -0.1486719	0.0692917 -0.0216979 -0.0456780	-0.5932705 -0.5778156 -0.6178916	-0.4214608 -0.4090080 -0.4035363	-0.4762468 -0.4897628 -0.5369015	-0.4425221 -0.5390071 -0.6309320	2.6 2.7 3
Thailand[B/B]	-0.4644876 -0.5008620 -0.4228436	-1.4154217 -1.4289623 -1.1243091	0.2807178 0.1940281 0.2054967	0.2404329 0.1879719 0.2129218	-0.2239259 -0.1972667 -0.2094795	-0.2804693 -0.3158482 -0.2900638	3.4 3.5 3.4
Togo[A/A]	-1.0364148 -0.9990728 -0.9443664	-0.1862324 -0.2027896 -0.1807712	-1.3911764 -1.3844715 -1.3522638	-0.8580614 -0.8742416 -0.9955374	-0.8809670 -0.9134799 -0.8571527	-1.0271816 -0.9645153 -1.0045261	2.8 2.4 2.4
Trinidad and Tobago[B/B]	0.5287696 0.4847272 0.4814516	-0.1423586 -0.0350810 0.1479746	0.3026633 0.2652316 0.3165731	0.5372960 0.4980900 0.4036441	-0.2311557 -0.2201163 -0.1946019	-0.2077509 -0.3637427 -0.2818035	3.6 3.6 3.2
Tunisia[B/B]	-1.3138685 -1.3739657 -0.3869793	0.0580359 -0.0395656 -0.3688054	0.4038215 0.2381282 0.0584338	0.0023058 -0.0204361 -0.1923005	0.1994383 0.1219027 -0.1274057	-0.1100107 -0.1490342 -0.1776602	4.2 4.3 3.8
Turkey[B/B]	-0.0859277 -0.1172394 -0.1604871	-1.0318994 -0.9207515 -0.9556127	0.2892992 0.3080002 0.3627078	0.2988077 0.3086976 0.3819063	0.1018257 0.1176649 0.0798934	0.0740799 0.0299381 0.0552668	4.4 4.4 4.2
Uganda[B/A]	-0.4973373 -0.5014084 -0.5155829	-0.9895654 -1.0057549 -0.9869743	-0.6164339 -0.5203159 -0.5040336	-0.1493775 -0.1547709 -0.1405176	-0.4183059 -0.3913537 -0.3461848	-0.8871338 -0.9043889 -0.8953211	2.5 2.5 2.4
United Kingdom[C/C]	1.3118691 1.2945345 1.2971972	0.1063631 0.4012845 0.3522841	1.5028822 1.5597883 1.5529801	1.5914834 1.7362128 1.6572325	1.7258259 1.7613611 1.6448453	1.6020917 1.5604578 1.5843287	7.7 7.6 7.8
United States[C/C]	1.0856407 1.1218738 1.1123725	0.4274564 0.4353017 0.5971747	1.5043971 1.5494080 1.5121591	1.3903865 1.4336494 1.4466683	1.5753502 1.6298378 1.6050059	1.2625986 1.2596634 1.2650395	7.5 7.1 7.1
Uruguay[C/C]	1.1002216 1.1369935 1.1114170	0.7731232 0.8240150 0.9577487	0.5957077 0.6362628 0.5584622	0.3651304 0.3846426 0.4272462	0.6827802 0.6960787 0.6529912	1.1905343 1.2446652 1.2377604	6.7 6.9 7
Venezuela[A/A]	-0.8870522 -0.9016078 -0.9581654	-1.2737008 -1.2428352 -1.0853446	-0.9725413 -1.1023417 -1.1890152	-1.5768356 -1.6080948 -1.4701347	-1.5907717 -1.6448500 -1.6689060	-1.1572539 -1.2072380 -1.1613224	1.9 2 1.9
Viet Nam[B/B]	-1.4626455 -1.4764487 -1.4247212	0.2389375 0.1065800 0.1667461	-0.2486034 -0.2625494 -0.2317645	-0.6179877 -0.6120019 -0.5946119	-0.4740645 -0.5268918 -0.4831960	-0.5347946 -0.6279593 -0.6151475	2.7 2.7 2.9
Zambia[B/A]	-0.3195766 -0.2557004 -0.1819243	0.5346590 0.4616148 0.4706945	-0.7911401 -0.8300148 -0.6366958	-0.5024495 -0.4786313 -0.4211538	-0.4850474 -0.4978060 -0.4686933	-0.5132091 -0.5654289 -0.4782632	3 3 3.2

Appendix 2: Estimation results for 1998

Table A2.1: *Variation of GDP per capita (with corruption and governance data of 1998)*

Explanatory variables	Preliminary specification (PS)		Preliminary specification & *VA*		Preliminary specification & *LV*		Preliminary specification & *GE*		Preliminary specification & *RB*		Preliminary specification & *RL*	
	WGI98	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*
Intercept	1.14 (0.74)	-0.19 (0.93)	1.10 (0.70)	0.93 (1.03)	1.61* (0.70)	0.45 (0.93)	2.04** (0.66)	1.19 (1.03)	1.75** (0.67)	0.81 (1.00)	1.82** (0.68)	0.93 (0.95)
y_0	-0.51*** (0.06)	-0.56*** (0.08)	-0.50*** (0.06)	-0.64*** (0.09)	-0.54*** (0.05)	-0.58*** (0.08)	-0.55*** (0.05)	-0.63*** (0.08)	-0.52*** (0.05)	-0.61*** (0.08)	-0.54*** (0.05)	-0.60*** (0.08)
Investment	0.13*** (0.02)	0.21*** (0.03)	0.13*** (0.02)	0.21*** (0.03)	0.14*** (0.02)	0.21*** (0.03)	0.11*** (0.02)	0.18*** (0.03)	0.13*** (0.02)	0.20*** (0.03)	0.11*** (0.02)	0.18*** (0.03)
Education	1.25*** (0.25)	1.49*** (0.35)	0.84** (0.27)	1.17** (0.37)	1.05*** (0.24)	1.15** (0.36)	0.82*** (0.23)	1.26*** (0.34)	0.71** (0.25)	1.14** (0.37)	0.93*** (0.24)	1.19*** (0.34)
Population	0.002 (0.001)	0.07 (0.05)	0.002· (0.001)	0.05 (0.04)	0.002 (0.001)	0.06 (0.04)	0.002* (0.001)	0.06 (0.04)	0.002* (0.001)	0.06 (0.04)	0.002· (0.001)	0.04 (0.04)
Openness	0.42*** (0.08)	0.50*** (0.09)	0.43*** (0.08)	0.48*** (0.09)	0.35*** (0.08)	0.46*** (0.09)	0.34*** (0.07)	0.42*** (0.09)	0.37*** (0.08)	0.45*** (0.09)	0.34*** (0.08)	0.45*** (0.09)
WGI98	-0.66*** (0.15)		0.28 (0.31)		0.23 (0.27)		1.19*** (0.34)		0.75* (0.30)		0.94** (0.34)	
CPI98		-0.31* (0.12)		0.07 (0.21)		0.12 (0.21)		0.29 (0.26)		0.30 (0.29)		0.36 (0.25)
*WGI98*VA98*			-0.64*** (0.19)									
*CPI98*VA98*				-0.36* (0.16)								
*WGI98*LV98*					-0.62*** (0.16)							
*CPI98*LV98*						-0.35* (0.14)						
*WGI98*GE98*							-1.25*** (0.21)					
*CPI98*GE98*								-0.46** (0.17)				
*WGI98*RB98*									-1.03*** (0.20)			
*CPI98*RB98*										-0.50* (0.21)		
*WGI98*RL98*											-1.06*** (0.20)	
*CPI98*RL98*												-0.49** (0.16)
N	115	73	115	73	115	73	115	73	115	73	115	73
Adjusted-R^2	0.589	0.592	0.626	0.617	0.637	0.622	0.685	0.628	0.668	0.620	0.666	0.637

Note: The table reports the estimated coefficients of the regression variables with superscripts "***", "**", "*", "·" indicating statistical significance at 0, 0.1, 1, 5, and 10 % error level, respectively. GLS standard deviations are in parenthesis.

Table A2.2: *Variation of capital stock (with corruption and governance data of 1998)*

Explanatory variables	Preliminary specification (PS)		Preliminary specification & *VA*		Preliminary specification & *LV*		Preliminary specification & *GE*		Preliminary specification & *RB*		Preliminary specification & *RL*	
	WGI98	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*	*WGI98*	*CPI98*
Intercept	2.62** (0.94)	3.28* (1.36)	2.62** (0.94)	3.18* (1.58)	3.07** (0.96)	4.09** (1.39)	3.16*** (0.91)	4.47** (1.46)	3.09*** (0.93)	4.65** (1.44)	3.13*** (0.90)	4.52*** (1.33)
y_0	-0.38*** (0.09)	-0.51*** (0.12)	-0.38*** (0.08)	-0.50*** (0.13)	-0.40*** (0.08)	-0.53*** (0.12)	-0.42*** (0.08)	-0.61*** (0.13)	-0.39*** (0.08)	-0.59*** (0.12)	-0.42*** (0.08)	-0.61*** (0.12)
Education	0.79* (0.35)	1.19* (0.52)	0.76· (0.39)	1.22* (0.57)	0.66· (0.35)	0.78 (0.55)	0.35 (0.36)	0.85 (0.53)	0.35 (0.38)	0.62 (0.56)	0.38 (0.35)	0.63 (0.52)
Openness	0.35** (0.11)	0.36** (0.13)	0.35** (0.11)	0.36** (0.13)	0.29* (0.11)	0.30* (0.13)	0.31** (0.10)	0.32* (0.13)	0.31** (0.11)	0.30* (0.13)	0.30** (0.10)	0.33** (0.12)
WGI98	-0.10 (0.22)		-0.03 (0.48)		0.59 (0.41)		1.55** (0.54)		1.04* (0.48)		1.69** (0.52)	
CPI98		-0.05 (0.19)		-0.08 (0.33)		0.49 (0.33)		0.60 (0.37)		0.88* (0.44)		0.96** (0.36)
*WGI98*VA98*			-0.05 (0.29)									
*CPI98*VA98*				0.03 (0.25)								
*WGI98*LV98*					-0.49* (0.249)							
*CPI98*LV98*						-0.44· (0.22)						
*WGI98*GE98*							-1.10** (0.33)					
*CPI98*GE98*								-0.51* (0.25)				
*WGI98*RB98*									-0.83** (0.31)			
*CPI98*RB98*										-0.76* (0.33)		
*WGI98*RL98*											-1.18*** (0.32)	
*CPI98*RL98*												-0.75** (0.23)
N	115	73	115	73	115	73	115	73	115	73	115	73
Adjusted-R^2	0.222	0.3209	0.222	0.3211	0.248	0.353	0.289	0.355	0.266	0.367	0.305	0.406

Note: The table reports the estimated coefficients of the regression variables with superscripts "***", "**", "*", "·" indicating statistical significance at 0, 0.1, 1, 5, and 10 % error level, respectively. GLS standard deviations are in parenthesis.

Appendix 3: Robustness check

The aim here is to check the robustness of the support that the estimations of equations (1) and (2) yield to GWH. Following Méon & Sekkat (2005), and initiated by new growth literature, a new interaction term between initial income and human capital (y_0*Education*) is included among the predictors in order to observe whether the coefficients of the former explanatory variables resist to the new factor. The results of the checking are reported in *Table A3* for years 2009, 2010, and 2011.

Table A3: Robustness check (with corruption and governance data of 2009, 2010, and 2011)

Explanatory variables		PS of equation (1) & one interaction term		PS of equation (1) & two interaction terms – *GE*		PS of equation (1) & two interaction terms – *RL*		PS of equation (2) & one interaction term		PS of equation (2) & two interaction terms – *GE*		PS of equation (2) & two interaction terms – *RL*	
		WGI	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*	*WGI*	*CPI*
Intercept	09	-1.513	-1.25	-0.90	-1.03	-1.58	-1.76	-2.18	-1.77	-1.98	-1.81	-2.44	-2.37
		(1.62)	(1.65)	(1.47)	(1.49)	(1.47)	(1.50)	(2.37)	(2.35)	(2.30)	(2.30)	(2.25)	(2.26)
	10	-2.22	-1.77	-1.56	-1.85	-2.18	-2.47	-2.70	-2.21	-2.46	-2.50	-2.86	-3.05
		(1.68)	(1.70)	(1.53)	(1.54)	(1.55)	(1.57)	(2.44)	(2.40)	(2.37)	(2.36)	(2.33)	(2.33)
	11	-2.59	-2.19	-1.94	-2.22	-2.47	-2.75·	-2.56	-2.29	-2.30	-2.50	-2.64	-3.01
		(1.72)	(1.74)	(1.60)	(1.61)	(1.61)	(1.63)	(2.51)	(2.45)	(2.45)	(2.42)	(2.39)	(2.39)
y_0	09	-0.09	-0.11	-0.06	-0.07	-0.03	-0.03	0.42	0.34	0.45	0.37	0.49	0.42
		(0.23)	(0.24)	(0.21)	(0.22)	(0.21)	(0.22)	(0.35)	(0.36)	(0.34)	(0.35)	(0.33)	(0.34)
	10	0.01	-0.04	0.02	0.04	0.04	0.07	0.50	0.42	0.51	0.49	0.53	0.54
		(0.24)	(0.24)	(0.22)	(0.22)	(0.22)	(0.23)	(0.36)	(0.36)	(0.35)	(0.35)	(0.34)	(0.35)
	11	0.04	-0.005	0.04	0.08	0.07	0.11	0.43	0.42	0.44	0.49	0.47	0.55
		(0.25)	(1.25)	(0.23)	(0.23)	(0.23)	(0.23)	(0.37)	(0.36)	(0.36)	(0.36)	(0.36)	(0.36)
Investment	09	0.09**	0.08**	0.06*	0.06*	0.07**	0.07**						
		(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)						
	10	0.09**	0.08**	0.06*	0.06*	0.07**	0.07**						
		(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)						
	11	0.09**	0.08*	0.07*	0.06*	0.07**	0.07*						
		(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)						
Education	09	4.66*	4.36*	4.79**	4.77**	5.12**	5.21**	7.91**	7.07*	7.99**	7.28*	8.44**	7.92**
		(1.97)	(2.04)	(1.78)	(1.84)	(1.79)	(1.86)	(2.95)	(2.98)	(2.87)	(2.92)	(2.81)	(2.87)
	10	5.45**	4.90*	5.26**	5.54**	5.71**	6.04**	8.44**	7.79**	8.28**	8.18**	8.75**	8.88**
		(2.00)	(2.03)	(1.82)	(1.84)	(1.84)	(1.88)	(3.01)	(2.97)	(2.92)	(2.92)	(2.87)	(2.89)
	11	5.46**	5.00**	5.22**	5.66**	5.73**	6.17**	7.77*	7.78**	7.57*	8.20**	8.12**	8.99**
		(2.06)	(2.06)	(1.90)	(1.91)	(1.92)	(1.95)	(3.10)	(3.02)	(3.02)	(2.99)	(2.95)	(2.95)
Population	09	0.001	0.001	0.001	0.001	0.000	0.000						
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)						
	10	0.004	0.002	0.004	0.006	0.002	0.003						
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)						
	11	0.001	-0.007	0.00	0.00	-0.003	-0.003						
		(0.002)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)						
Openness	09	0.31**	0.31**	0.24*	0.22*	0.26**	0.25**	0.29*	0.30*	0.26·	0.26·	0.25·	0.25·
		(0.10)	(0.11)	(0.09)	(0.10)	(0.09)	(0.10)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
	10	0.32**	0.32**	0.26**	0.24*	0.28**	0.26**	0.30*	0.31*	0.28*	0.28*	0.28*	0.27*
		(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.10)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
	11	0.34**	0.33**	0.28**	0.26**	0.29**	0.27**	0.32*	0.31*	0.30*	0.28·	0.29*	0.26·
		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.15)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
y_0*Education*	09	-0.38	-0.34	-0.47*	-0.47·	-0.49*	-0.50*	-0.94*	-0.82*	-1.01**	-0.90*	-1.07**	-0.99*
		(0.26)	(0.27)	(0.23)	(0.24)	(0.24)	(0.25)	(0.39)	(0.40)	(0.38)	(0.39)	(0.37)	(0.38)
	10	-0.49·	-0.41	-0.54*	-0.58*	-0.57*	-0.61*	-1.01*	-0.92*	-1.07**	-1.04**	-1.11**	-1.12**
		(0.26)	(0.27)	(0.24)	(0.24)	(0.24)	(0.25)	(0.40)	(0.39)	(0.39)	(0.39)	(0.38)	(0.38)
	11	-0.50·	-0.42	-0.54*	-0.59*	-0.58*	-0.63*	-0.92*	-0.92*	-0.96*	-1.03*	-1.03**	-1.13**
		(0.27)	(0.27)	(0.25)	(0.25)	(0.25)	(0.26)	(0.41)	(0.40)	(0.40)	(0.40)	(0.39)	(0.39)
WGI	09	-0.50*		1.31**		1.32**		-0.40		1.07·		1.60*	
		(0.21)		(0.40)		(0.41)		(0.31)		(0.64)		(0.64)	
	10	-0.55*		1.31**		1.26**		-0.44		1.14·		1.64*	
		(0.21)		(0.42)		(0.44)		(0.32)		(0.67)		(0.68)	
	11	-0.47*		1.35**		1.29**		-0.24		1.34·		1.98**	
		(0.22)		(0.45)		(0.47)		(0.33)		(0.71)		(0.71)	
CPI	09		-0.35		1.16***		1.06**		-0.19		0.81		1.22*
			(0.19)		(0.34)		(0.33)		(0.27)		(0.54)		(0.51)
	10		-0.37*		1.06**		0.96**		-0.27		0.67		1.02*
			(0.18)		(0.33)		(0.33)		(0.27)		(0.52)		(0.51)
	11		-0.47*		1.35**		1.29**		-0.24		-0.34·		1.98**
			(0.22)		(0.45)		(0.47)		(0.33)		(0.71)		(0.71)

Table A3 continues on the next page.

Table A3 continued:

*WGI*GE*	09			-1.26*** (0.24)						-1.02** (0.39)			
	10			-1.26*** (0.25)						-1.07** (0.40)			
	11			-1.23*** (0.27)						-1.07* (0.42)			
*CPI*GE*	09				-0.94*** (0.18)						-0.62* (0.28)		
	10				-0.91*** (0.18)						-0.59* (0.28)		
	11				-0.84*** (0.19)						-0.51· (0.29)		
*WGI*RL*	09					-1.19*** (0.24)						-1.31*** (0.37)	
	10					-1.16*** (0.25)						-1.34*** (0.39)	
	11					-1.14*** (0.27)						-1.44*** (0.41)	
*CPI*RL*	09						-0.84*** (0.16)						-0.84** (0.26)
	10						-0.80*** (0.17)						-0.78** (0.27)
	11						-0.74*** (0.18)						-0.77** (0.28)
N	09	117	114	117	114	117	114	117	114	117	114	117	114
	10	117	114	117	114	117	114	117	114	117	114	117	114
	11	116	113	116	113	116	113	116	113	116	113	116	113
Adjusted-R^2	09	0.476	0.460	0.572	0.563	0.568	0.557	0.231	0.236	0.274	0.266	0.305	0.300
	10	0.481	0.463	0.570	0.558	0.559	0.546	0.241	0.247	0.284	0.274	0.309	0.298
	11	0.469	0.455	0.547	0.534	0.539	0.524	0.236	0.249	0.275	0.269	0.308	0.296

Note: The table reports the estimated coefficients of the regression variables with superscripts "***", "**", "*", "·" indicating statistical significance at 0, 0.1, 1, 5, and 10 % error level, respectively. GLS standard deviations are in parenthesis.

Table A3 shows that the signs of the estimated coefficients of the initial independent variables remain unchanged, but the estimates of the intercept and those of y_0 cease to be significant. The new variable y_0*Education* is always negative and generally significant, and its entry in the regressions does not notably modify the main findings. As to equation (1), its introduction in the preliminary specification even enhances the quality of results in particular regarding our variable of interest. With both *WGI* and *CPI*, corruption remains negatively associated with GDP per capita; this findings is statistically significant at least at 10 % level, remaining stable throughout the study period. Total variance in the model has slightly increased. Moreover, in the second specification, the significance of coefficients remains unchanged. The coefficients of corruption are positive confirming that when *GE* or *RL* is weak, corruption generates significantly positive influences on growth. The negative signs of the coefficients of the interaction terms between *GE* or *RL* and corruption also lead to the same conclusion. The adjusted-R^2 values relatively increase in the same proportions as in the former case.

With equation (2), the overall quality of the model also improves. The coefficients of corruption in the preliminary specification are negative throughout the period, but remain statistically insignificant. With y_0*Education* and the interaction terms associated with *RL*, the findings stay robust and are still in line with the conclusion that corruption tends to be beneficial to investments. In the estimates involving *GE*, the significance of *WGI* is slightly reduced (to 10 % from 5 %). The coefficients of *CPI* are insignificant, meaning that estimates based on this index are inconclusive about the impact of corruption on capital stock in countries showing weak *GE*.