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Does Corruption Influence Debt?

Abstract

This paper analyzes external debt in developing countries and whether its variability can in part be explained by corruption levels. To combat endogeneity, four different instrument variables are tested and I find ethnolinguistic fractionalization as the only valid instrument. The results prove robust to the inclusion of an instrument where corruption and aid prove significant as explanatory variables for external debt. Moreover, regional dummies have been added and found to be significant for the regions of Asia and the Middle East.

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1. Introduction

International financial institutions (IFIs), governments and private banks typically place different demands on developing countries when they negotiate debt packages. One which has gained more prominence since the mid-nineties is good governance[1]. However, in practice do corrupt governments face constraints that don't allow them to borrow? Are the IFI's favoring some countries or regions and allowing them more funds as compared to other countries with similar macroeconomic standing? A cross-country empirical model will be presented in this paper where the major point of interest is whether corrupt countries actually hold less debt.

Naturally, many other stipulations might supersede the good governance criteria. Since the 1970's, the commercial banks have become a significant lender to developing countries[2] and they would naturally be more concerned with the issues of repayment, risk of default, the possibility of bailouts etc. However, this paper will not distinguish between loans provided by different creditors (whether IFIs, banks or governments.)

This paper will examine whether corrupt countries are actually able to borrow less than countries with better governance. This has not directly been examined in the literature before. Corruption and debt issues of developing countries have been dealt with separately and only a few papers have examined the issues jointly. Until now, the issue of whether corrupt governments have been able to borrow more money than what creditors have otherwise portrayed to be their policy, has not been empirically examined or thoroughly discussed from a theoretical point of view. This paper will provide a preliminary model, address possible problems and seek to understand the framework within which the variability of external debt can be explained by corruption.

The outline of this paper is as follows. Firstly, some theoretical aspects as well as past contributions of scholars on the matters of foreign debt and corruption are examined.

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[1] Since 1996 the IMF has increasingly incorporated corruption into its conditionality of providing loans (James 1998.)
[2] Many private banks in the developed world had excess capital after the oil price hikes of the 1970's. Oil revenue, mainly from the Middle East, was funneled in huge sums to banks in the Western hemisphere. The banks, having an excess amount of capital available and few places to invest, increasingly became involved in lending money to developing country governments (see Krugman and Obstfeld (2005) for further details.)

Since the joint examination is relevant for this paper and this has not previously been a focus of authors, the literature review will serve as a rather limited survey of the two separate issues. Thereafter in Section 3, an empirical model is presented and a discussion of the data follows. Section 4 presents the empirical findings of a cross-country analysis to examine the hypothesis which includes a thorough discussion of the findings of the empirical work. Hereafter, Section 5 concludes the paper and includes a scope for future research.

2. Theoretical and Empirical Overview

Understanding the reasons why countries might choose to hold debt and the consequences thereof are of paramount importance to further examine whether corrupt governments will be successful in obtaining debt. Before delving into this matter, I will shortly define the concepts of debt and corruption.

Debt can take many forms and it is important to distinguish between public debt (also referred to as government debt) which can be both external and internal (i.e. borrowed from domestic or foreign lenders, respectively) and external debt (or foreign debt) which is debt owed to foreigners. The latter can include loans from other governments, IFIs as well as commercial banks. In this paper only external debt will be used, as I aim to examine whether corruption has any bearing on the total debt level of a developing country.

Corruption on the other hand is a far more elusive term and has a very broad range of definitions. There are many and varied definitions of corruption, which includes a principal-agent setting, where the main problem lies in the effective monitoring and the provision of the correct incentives to induce the agent to perform their duties with integrity as is the case in Bardhan (1997). Some believe, as Kaufmann and Vicente (2005,) that the definition should focus more on the behavior of the people who are involved in corruption. If legal barriers, such as red tape and bureaucracy, can be erected in order to make the corruption less visible to the population but when the population has the ability to take actions in order to remove a government, corruption can be viewed as legal. Kaufmann and Vincente thereby make an important distinction between legal and

illegal forms of corruption, where illegal corruption occurs when the population has little recourse against rent-seeking behaviour.

Many other definitions of corruption are also used in the literature, including paying bribes to obtain lucrative government contracts, to reduce taxes or fees payable to the government or to speed up legal processes, influencing outcomes of the regulatory process etc.[3] For the purposes of this paper, the most widely used definition of corruption as "the use of public office for private gain"[4] will be used. Although this is a very general and broad definition, it encompasses the notion of intentional misuse of power. As I would like to test whether more corrupt governments are restricted in their borrowing capabilities, the restriction of this definition of corruption to only include public office is sufficient.

The issues of debt and corruption have not been dealt with simultaneously and I will therefore present a short survey of the most relevant articles of each of the two issues. I will concentrate on issues that complement the study presented in this paper, since each topic has been dealt with extensively. Thereafter I will discuss a few articles that have dealt with the combined issues although they do not deal with the hypothesis examined in this paper in a direct fashion.

2.1 Debt theory

The classic public debt theory literature as exemplified by Barro (1979), deals with Ricardian equivalence type issues (whether the government mainly faces a tax now or tax later decision) and optimal debt determination. He finds that positive temporary changes in government spending increases public debt issue whereas positive, temporary income decreases the public debt issue. However according to the model, the growth rate of the debt would only be affected by a small degree to government expenditure and the growth rate would be independent of the debt-income ratio. Barro uses U.S. data from 1917-1976 to test the results of his model empirically, which are corroborated by the data. However, the validity of the model on the developing countries of today can be

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[3] Gray and Kaufmann (1998) mention these forms of corruption as examples.
[4] E.g. used by Bardhan (1997) and different derivations thereof have for example been employed by Nas, Price and Weber (1986).

questioned, as I do not believe that the reasons for holding debt are similar for developed and developing countries.

There is a vast literature on possible reasons for this. Quite generally, public debt can be undertaken as an alternative to taxation in order to secure funding for government expenditure. Gill and Pinto (2005) describe the following as three reasons for the governments of developing countries to prefer debt over taxation:

1. **Tilting**: from an equity point of view, it is not fair to tax the current generation in order to be able to make investments that will benefit future generations and arguably make them more rich.

2. **Smoothing**: enables the government to conduct counter-cyclical policies without efficiency losses resulting from frequent raising and lowering of taxes.

3. **Stability**: relying on printing money (seigniorage) can lead to high and volatile inflation[5], hurting investment and distorting the information value of market prices.

These three reasons do not appear to be distinct for developing countries however the authors argue that these reasons for holding debt are essential for developing countries, since they oftentimes have a much weaker taxation capacity. Essential investments in infrastructure projects and the social sector are needed to facilitate growth in developing countries and this requires debt as a solid source of funding.

A heavier reliance on debt does imply a few problems. The primary problem is that debt is simply referred taxes – future generations must repay what is borrowed today. Only if the investments made possible by loans were successful in ensuring the future growth, can there be hope for a stronger tax basis that will be able to repay the loans. A second and more profound problem that is still being discussed today is the problem of overborrowing. Some argue that governments will tend to overborrow simply because they have the opportunity to do so.[6] After the default of some developing countries the IFIs have bailed them out. These events spur the developing countries' governments on to borrow more than they otherwise would, leading to a moral hazard problem. Others, like

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[5] Might not occur if the economy is growing and the real income is rising.
[6] Many different theories and explanation has been put forth in the literature. For a good and up-to-date overview I suggest Gill and Pinto (2005.)

Bulow (1999), argue that it is the lenders that represent the moral hazard problem, since they lend money to the governments hoping that they will be remunerated by IFI bailouts. Without the possibility of a bailout, the loans would not be justifiable to the private lenders.

Overall, this literature suggests the inclusion of some control variables for the level of development since the poorer countries will need relatively bigger investments in infrastructure and the establishment of a solid legal and regulatory framework. Moreover, the inclusion of some restriction on the power of the executive would help creditors believe that they will be repaid.

2.2 Corruption

Many papers deal with trying to determine the underlying causes of corruption, which has lead to a greater focus on political institutions. Lederman, Loayza and Soares (2001) provide a valuable contribution to this strand of literature using a cross-country panel to focus on the channels of corruptions, where political accountability and the structure of provision of public goods are being discussed as two such important channels. They examine many political institutions and determine that democracies, parliamentary systems, political stability and freedom of press all are associated with lower corruption. They argue that where political accountability is high, the public will have the means to assess and monitor the government as well as being able to punish them for conducting bad policies. This means that the politicians are held liable for their actions. It also requires transparency and freedom of press so the public can both know about the corrupt behavior and successfully be able to deal with the politicians. The authors' idea is in line with Kaufmann and Vicente (2005), where in this case the population will have the means to detect corrupt behaviour.

The other channel of provision of public goods deals with the competitiveness of the environment surrounding the provision of public goods. The less competitive this environment is, the less services among different public agencies are substitutable, thereby providing the respective agency monopoly power (e.g. in determining who gets the contracts.) Similarly, if government agencies provide highly complementary services, where for example one must obtain licences from many such agencies that each hold the

power to obstruct this process, they also have an incentive to act in a corrupt manner. Lederman et al. find that the political variables that are the most important are the ones related to democracy, presidential systems, time of democratic stability and freedom of press.

Another strand of literature attempts to determine the consequences of corruption. Mauro (1995) presents evidence that corruption leads to lower investment which in turn lowers economic growth opportunities. In order to correct for a possible endogeneity problem between corruption and economic growth, ethnolinguistic fractionalization was used as an instrument and the results still hold, lending more support to the corruption's adverse effect on growth working through the channel of investments. He makes these findings more robust by extending his analysis in Mauro (1996) where he also finds that corruption in government leads to lower spending on education. This is yet another channel through which growth will be adversely effected.

From this literature, it is again found that a control of government form or civil rights of the population should be included. Moreover, a possible instrument for corruption has appeared from Mauro (1995) that seems very reasonable.

2.3 Both debt and corruption combined

Not many authors have examined the relationship between corruption and debt so far. An exception to this is the paper by Aizenman and Marion (2004), in which political economy considerations, including corruption, are determining factors for the demand for international reserves. They find that the more corruption there exists in a country, the more that country will demand external borrowing as opposed to international reserves. Especially with the possibility of future looting by opportunistic policy makers, there seems to be little incentive to build up international reserves that could be misspent.

An important issue that Aizenman and Marion touch upon, and one that Kohlscheen and O'Connell (2006) further highlight, is the access of funds to developing countries. Branches of the IMF and other IFIs are increasingly acting as guarantors for repayment on the behalf of developing countries. This area is very diffuse and politicized and beyond the scope of this paper. Nonetheless, it is a very important aspect since it directly impacts the availability of funds to developing countries.

3. Empirical Model

3.1 Data[7]

The one measure that deserves more thorough description is the main variable that is of interest in this paper – the corruption variable. There are no perfect corruption measures, partly because of the difficulty in defining the concept as apparent from the discussion. All corruption measures that are available today are subjective figures that are mainly collected through surveys. Lederman, Loayza and Soares (2001) argue that even though different methods have been employed and different samples have been surveyed, most corruption measures are highly correlated with one another. Moreover, the type of bias that could be present in subjective measures would arguably be present in all corruption measures that are available to us today. As subjective opinions on corruption are surveyed, it might be possible that the people surveyed have been responding in part to the overall economic performance rather than their perception of corruption present in the country. Lederman et al. do not seem to believe this bias is present since the correlation between one of their corruption measures[8] and GDP per capita is very low and not statistically significant. However, the corruption measures the authors have tested for have not been used in this paper. I have chosen Control of Corruption as collected and presented by Kaufmann, Kraay and Mastruzzi (2006) which is freely available, whereas Lederman et al. have used corruption measures that are costly. Kaufmann et al.'s measure of corruption is also survey based and the methodology employed in conducting the survey does not seem to differ widely from the other survey based corruption measures.

A country in need of funds could also obtain them through aid receipts. Aid is available from IFIs, NGOs and governments, however it is not clear whether donors base their contributions on strict need or other politico-social factors. Corruption is not the overriding factor for most donors Alesina and Weder (2002) find; only the US, the Nordic countries and Australia give less aid to corrupt governments. Including aid is interesting in order to examine if debt variability is to some degree explained by aid.

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[7] The data sources and descriptions are included in Appendix A.
[8] They use corruption measures from the International Country Risk Guide, the World Development Report, Gallup, the Global Competitiveness Survey and the Country Risk Review.

The current account will also be included to see if deficits or surpluses will lead to increased or decreased debt stocks, respectively. If a country has a deficit, it is in greater need of funds however creditors would be worried if repayments are possible if persistent deficits occur. Mellios and Paget-Blanc (2006) also use this as an explanatory factor for determining the credit rating of each developing country, which is especially used by private creditors in order to assess repayment probabilities.

Based on the literature review above, it seems that controls on the executive are important to include in any further examination of the link between corruption and debt. I have chosen to include democracy which both the public debt literature and corruption literature have incorporated. I use a measure of democracy collected by Beck et al. (2005) to serve as a control variable.

The countries chosen for this paper were firstly based on the classification used by the World Bank as developing countries and secondly on data availability. The only subjective choice for the sample, were the exclusion of EU member countries that could be characterized as belonging to the developing country category. I chose not to include them because they receive considerable funding from the EU which has a direct impact on their macroeconomic standing. Including them might otherwise have skewed the results of this paper. Furthermore, these countries face a more direct pressure from the EU to conform to its standards for external debt, which would have been present at 2002 both for countries that had already joined the EU as well as accession countries. No other selection methods were used to determine the sample.

3.2 Model estimation

The basic model estimated in this paper is of the following form:

$$\ln debt_i = \beta_0 + \beta_1(corr\_gmv_i) + \beta_2(aid\_gdp_i) + \beta_3(ca\_gdp_i) + \beta_4(dem\_dum_i) + \mu_i^{\,9}$$

This is a cross-country model with data from 128 developing countries from 2002. It is of log-lin form where only the dependent variable is in the natural log form. Of

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[9] Please see Appendix A for data labels and variable explanations.

the independent variables only the current account balance and aid measure has been standardized by GDP.

Corruption is the main variable of interest. Whether developing countries have a higher or lower debt burden when they are relatively more corrupt is not clear. According to the IFIs and most governments providing loans, corrupt governments will be able to borrow less which suggests a negative β_1. However, there may be political, colonial ties, trade relations, and profitability considerations etc. that might override the good governance criteria and thereby still provide corrupt governments with loans. If this coefficient turns out to be significant, further research is needed to clarify channels through which debt and corruption are interconnected as well as the important issue of causality.

Aid is a variable that is thought to be highly correlated with debt. Developing countries that are in need of external funding have the two options of borrowing or receiving aid (if the capital account does not provide sufficient funds.) Therefore, a country that has a need for external funding will most likely hold both debt and be an aid recipient. Loans and aid could to some extent be viewed as complementary goods. The expected sign of β_2 is therefore positive.

Holding a current account deficit implies a dependence on foreign creditors. These countries might have problems paying their debt if they run persistent deficits. But since this paper does not examine time series data, it is more likely that a country with a current account deficit will refer to its need for foreign funds. As a result, I expect current surpluses to imply lower debt holdings and I therefore expect β_3 to be negative.

For some providers of funds the state form of a country is important. Most notably, the US seeks to promote democracy worldwide. Dollar and Alesina (2000) concluded that the Netherlands, the UK, Canada and the Nordic countries give more aid to democratic countries. It is not clear whether the private banks put as much weight on democracy as the abovementioned countries do, but the IFIs could. It is of interest to see whether this result also holds for debt. If so, the coefficient β_4 is expected to be negative. There is little reason for an autocracy to be able to borrow more. Again, other politico-social considerations might override this variable.

4. Empirical Analysis

4.1 Preliminary Analysis

We begin by examining the scatter plots of the independent variable with each of the dependent variables (except for the dummy variable.)

Figure 1: Scatterplot of debt and corruption
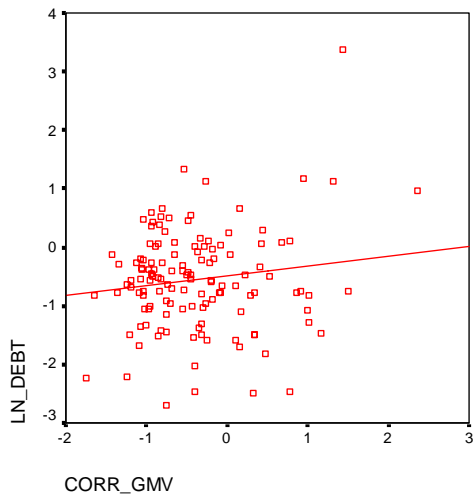
Figure 2: Scatterplot of debt and current account
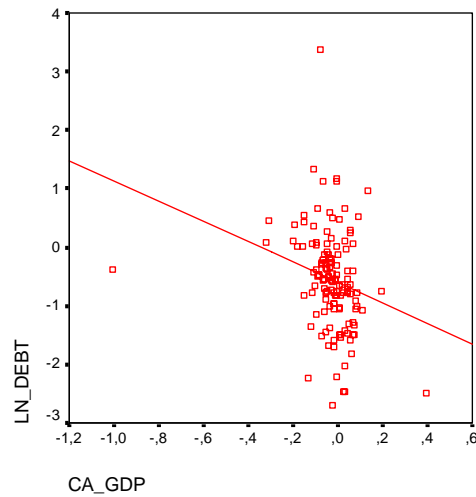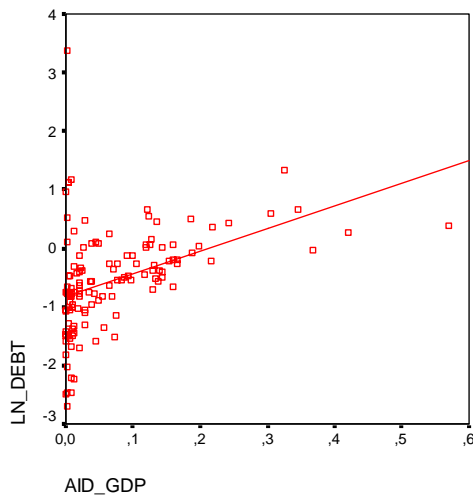

Figure 3: Scatterplot of debt and aid

The figures above suggest the possibility of a relationship between the corruption, current account and aid figures with the independent variable. There are a few noticeable outliers in all three figures. It is apparent in all of Figures 1 through 3 that Bahamas has a markedly large debt to GDP ratio, which makes it stand out in contrast to the other

countries. In Figure 2, Chad can be seen to have a current account to GDP ratio of almost negative one which is quite distinct from the rest of the sample. However, it has a much smaller residual that is the case for Bahamas. I do not find any convincing argument for neither of the explanatory variables in the model to explain the larger debt to GDP holdings for Bahamas. Therefore, I will not remove Bahamas from the sample despite its large residual.

  In Figure 4, initial regression results are shown. (1) is the model specification from above. From this, we see that the only variable that is not statistically significant is the democracy dummy. The interpretation of the results is as follows: for a 1 point increase in the corruption variable (which means the country has decreased its corruption level,) the debt to GDP ratio increases by 30.4% ceteris paribus. This is in line with the IFI's and governments' policy that they will provide loans to countries that exhibit improving and/or good governance.

Figure 4: Regression results of primary model specifications

	Total external debt (ln_debt)	
Dependent variable	(1)	(2)
corr_gmv	0.304 (0.095)***	0.286 (0.102)***
aid_gdp	3.942 (0.750)***	4.073 (0.808)***
ca_gdp	-1.148 (0.580)**	-0.789 (0.597)
dem_dum	0.087 (0.151)	-0.022 (0.177)
afr_dum		-0.385 (0.222)*
asia_dum		-0.478 (0.237)**
eur_dum		-0.699 (0.288)**
me_dum		-0.601 (0.328)*
sa_dum		-0.184 (0.276)
Observations	128	128
R-square	0.260	0.310

*** significant at the 1% level
** significant at the 5% level
* significant at the 10% level

  The relationship between aid and debt is similar to what was anticipated. A unit increase in the aid to GDP ratio of 0.1 (alternatively, a 10% increase in the ratio)

increases debt by 39.74%. Aid and debt seem to be complementary, which makes intuitive sense. If a developing country needs capital, it mainly has two routes of access – acquiring debt or aid. Especially the IFIs and governments can have a motive in giving aid instead of loans for publicity reasons. It is noteworthy that the standardized coefficient for aid is 0.432 and 0.446 for specification (1) and (2), respectively. This large a coefficient seems questionable and perhaps it is masquerading for other variables. Moreover, causality could be questioned in this case.

The negative coefficient for the current account was also as anticipated. A 0.1 unit increase in the current account to GDP ratio decreases debt holdings by 11.41%. The developing countries with better current account balances hold lesser debt. Again, as caution is in order here since nothing has been established regarding the causal link. Whether developing countries can improve their current account because they have a lower debt burden or whether improving their current account leads to a lesser need (questionable that it would be lesser ability) to borrow is a matter that has not been settled in the literature. It is left open for future research to examine more closely as it does not fall within the scope of this paper.

Interestingly, it does not seem to matter whether a country is democratic or not to how much debt it holds. This would suggest that private lenders are primarily interested in other factors than the political regime of the country. It is more logical for them to be interested in measures such as the stability of a government, ability to repay etc. The IFI's on the other hand emphasize good governance as among their criteria for lending. However, it is very problematic to withhold (or simply be less willing to lend) money that can potentially benefit the citizens of a developing country independent of the structure of its government form.

In the second specification, (2), in Figure 4, I have included regional dummies to examine whether certain regions have significantly different debt burdens. Four out of the five dummy variables proved significant (where only South America was not significant) and all have negative coefficients. If a country is in Africa, Asia, Europe or the Middle East, they will ceteris paribus have a lower debt to GDP ratio. The regions not included in the dummy variable are the developing countries of Oceania, North and Central America

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(including the Caribbean.) The regions of Africa, Asia, Europe and Asia have lower debt to GDP ratios than Latin America and Oceania.

The inclusion of regional dummies has rendered the current account coefficient insignificant. The variability of the dependent variable that was explained by current account in (1) is perhaps captured to some degree by the regional dummies in (2).

4.2 Problems with endogeneity

As mentioned before, the regressions from Figure 4 do not in any way ascertain causal links between the dependent and independent variables. I find that the two variables of corruption and aid in the specification could be endogenous and therefore would be correlated with the error term μ_i. It is not clear whether the occurrence of corruption will lead to higher debt burden or if corruption is more prominent in countries with higher debt burdens. Similarly, if aid and debt are complementary as noted above then a change in one variable will inextricably lead to an increase in the other. This directly violates one of the four assumptions behind OLS estimation technique. If that is the case, the estimators will be incorrect.

The main reasons for the endogeneity problem are errors in variables, omitted variable bias or simultaneity. Errors in variables is unfortunately always a likely scenario as data collection procedures are rarely perfect, in general as human error can easily creep in. As previously noted, the corruption measure might include certain biases or in the worse case not even measure what it aims to. Accepting that errors in variables could occur in this data sample, I cannot conclude this to be the only source of endogeneity. As the model specifications of this paper have not been used before, I find the occurrence of omitted variable bias to be very likely.

4.3 Using instrument variables

Whether the problem arises due to errors in the corruption variable or omitted variable bias, an instrument variable (IV) could be used to correct for the inconsistent estimators found through OLS regression. The instrument chosen should be highly correlated with the independent variable but not with the debt burden in order to prove to be a good instrument.

Four possible variables that could cause corruption but not the debt burden are:

1. Ethnolinguistic fractionalization of the country, specifically the fraction of the population speaking English or another Western European language as their first language, which is also used by Hall and Jones (1999) and Mauro (1995).

2. Latitudinal difference between the capital of a country and the equator as used by Hall and Jones.

3. Settler mortality as used by Acemoglu, Johnson and Robinson (2001).

Acemoglu et al. used colonial settler mortality rates as an instrument for institutions, which can in part explain income differences in today's world. Similarly, the geographical variables of latitude and ethnolinguistic fractionalization have been used in the growth literature as an instrument to explain income disparities. I will use all of these four variables to test whether a good IV can be found by using the two stage least squares (2SLS) method. The second stage is of the same specification as the initial regression above. The first stage is given by the following specifications:

$$corr\_gmv_i = \alpha_0 + \alpha_1(engfrac_i) + \alpha_2(aid\_gdp_i) + \alpha_3(ca\_gdp_i) + \alpha_4(dem\_dum_i) + \varepsilon_{corr\_enf}$$
$$corr\_gmv_i = \phi_0 + \phi_1(eurfrac_i) + \phi_2(aid\_gdp_i) + \phi_3(ca\_gdp_i) + \phi_4(dem\_dum_i) + \xi_{corr\_euf}$$
$$corr\_gmv_i = \gamma_0 + \gamma_1(lat_i) + \gamma_2(aid\_gdp_i) + \gamma_3(ca\_gdp_i) + \gamma_4(dem\_dum_i) + \varphi_{corr\_lat}$$
$$corr\_gmv_i = \lambda_0 + \lambda_1(sm_i) + \lambda_2(aid\_gdp_i) + \lambda_3(ca\_gdp_i) + \lambda_4(dem\_dum_i) + \eta_{corr\_sm}$$

First, we will analyze the correlation coefficients between each IV and our initial corruption from Kaufmann et al. (2006.) The correlation diagram can be seen in Figure 5 below.

Figure 5: Correlation matrix of instruments with corruption

		corr_gmv	engfrac	eurfrac	lat	sm
corr_gmv	Pearson Correlation	1	0.255***	0.225***	0.124	-0.150
	Sig. (2-tailed)	-	0.009	0.021	0.208	0.271
	N	128	105	105	105	56
engfrac	Pearson Correlation	0.255***	1	0.531***	0.083	-0.119
	Sig. (2-tailed)	0.009		0.000	0.399	0.387
	N	105	105	105	105	55
eurfrac	Pearson Correlation	0.225**	0.531***	1	-0.140	-0.289**
	Sig. (2-tailed)	0.021	0.000	-	0.155	0.032
	N	105	105	105	105	55
lat	Pearson Correlation	0.124	0.083	-0.140	1	0.049
	Sig. (2-tailed)	0.208	0.399	0.155	-	0.723

		N	105	105	105	105	55
sm	Pearson Correlation	0.150	-0.119	-0.289**	0.049	1
	Sig. (2-tailed)	0.271	0.387	0.032	0.723	-
		N	56	55	55	55	56

*** significant at the 1% level
** significant at the 5% level

The geographic IVs of ethnolinguistic fractionalization seem to be the better instruments of the proposed instruments above. Both the English and other European language as primary language are significantly correlated with our initial corruption measure and are therefore worthy of further examination. The institutional IV of settler mortality is only correlated with other European language as primary language. However, note that this correlation is negative, which is somewhat counterintuitive if both can be used as an instrument for corruption. Before classifying the latitude and settler mortality as weak instruments, I will fun F-tests to confirm or reject this premise.

Aid is much more difficult to find a valid instrument for. The problem lies in the very strong ties between debt and aid. A valid IV must be strongly correlated with aid and not with debt. One suggestion for an IV is the size of the population in 1960 for each developing country. This suggests that aid given in 2002 is in part determined by historical factors. However, that the population size in 1960 is independent of debt in 2002 seems unlikely to be true. Debt holdings might also very well be explained by historic patterns and therefore this IV is not recommended. In fact, I am unable to find any IV that could theoretically be valid for aid in this model. Therefore, I will leave the aid to GDP variable as is as an explanatory variable with the possible consequence of inconsistent estimators.

The second stage will be determined using the basic specification of (1) and (2) but with the IV's as found in the first stage. The sample is now comprised of 105 countries with the first three IV's and only 56 countries with settler mortality. The results of the 2SLS can be seen in Figure 6 below. The regional dummy variables are also used to see if their significance still holds.

Figure 6: Results of 2SLS regression

2SLS	Total external debt (ln_debt)							
Dep. var.	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)[10]
corr_engfrac	1.616 (0.376)***	1.369 (0.372)***						
corr_eurfrac			1.583 (0.545)***	0.698 (0.316)**				
corr_lat					0.072 (0.953)	-0.727 (0.408)*		
corr_sm							-0.794 (2.571)	-1.950 (4.499)
aid_pop	6.158 (1.015)***	4.961 (0.945)***	6.100 (1.252)***	4.300 (0.960)***	3.443 (1.874)**	2.898 (1.024)***	0.967 (4.041)	0.542 (4.998)
ca_gdp	-1.594 (0.637)**	-0.442 (0.649)	-1.576 (0.700)**	-0.340 (0.676)	-0.711 (0.851)	-0.121 (0.709)	-0.434 (2.856)	1.549 (4.705)
dem_dum	0.011 (0.159)	-0.494 (0.218)**	0.013 (0.167)	-0.293 (0.217)	0.091 (0.179)	0.133 (0.175)	0.332 (0.912)	0.563 (1.310)
afr_dum		-0.236 (0.228)		-0.329 (0.235)		-0.526 (0.270)*		-0.577 (0.786)
asia_dum		-0.495 (0.260)*		-0.490 (0.271)*		-0.479 (0.275)*		-0.362 (0.413)
eur_dum		0.267 (0.766)		0.077 (0.795)		-0.328 (0.829)		-
me_dum		-1.820 (0.465)***		-1.237 (0.443)***		-		-
sa_dum		-0.188 (0.277)		-0.190 (0.288)		-0.345 (0.311)		-0.278 (0.394)
Observations	105	105	105	105	105	105	56	56
R-square	0.304	0.313	0.240	0.253	0.176	0.215	0.066	0.087
1SLS	**Corruption (corr_gmv)**							
engfrac	0.894 (0.328)***	1.015 (0.342)***						
eurfrac			0.408 (0.211)*	1.097 (0.294)***				
lat					0.005 (0.004)	0.000 (0.005)		
sm							0.000 (0.000)	0.000 (0.000)
aid_gdp	-1.369 (0.764)*	-0.781 (0,792)	-1.295 (0.800)	-0.496 (0.781)	-1.622 (0.782)**	-0.986 (0.825)	-1.279 (1.496)	-0.984 (1.649)
ca_gdp	0.978 (0,.03)	0.425 (0.593)	0.811 (0.607)	0.287 (0.573)	0.584 (0.602)	0.150 (0.615)	0.860 (1.561)	0.923 (1.796)
dem_dum	-0.017 (0.156)	0.284 (0.169)*	-0.042 (0.164)	0.284 (0.165)*	0.110 (0.166)	0.297 (0.182)	0.327 (0.247)	0.283 (0.268)
afr_dum		0.117 (0.219)		0.495 (0.259)*		-0.140 (0.215)		-0.140 (0.322)
asia_dum		0.262 (0.251)		0.705 (0.296)**		0.010 (0.250)		0.013 (0.383)
eur_dum		-0.006 (0.693)		0.447 (0.698)		-0.277 (0.735)		-
me_dum		1.113 (0.313)***		1.573 (0.350)***		0.872 (0.321)***		-
sa_dum		0.095 (0.257)		-0.141 (0,242)		-0.112 (0.281)		-0.034 (0.340)
Observations	105	105	105	105	105	105	56	56
R-square	0.142	0.268	0.111	0.302	0.090	0.200	0.089	0.095
F-test	10.938	4.810	7.907	3.538	5.350	3.290	0.902	0.710

*** significant at the 1% level

** significant at the 5% level

* significant at the 10% level

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[10] Since the sample has been considerably shortened, the countries from Europe and the Middle East are no longer in the sample and therefore no results for eur_dum and me_dum are reported.

From the 2SLS, it can be confirmed that the ethnolinguistic fractionalization instruments are superior to the other two. More specifically, the F-test of overall significance is used to assess the results. The null hypothesis for the test is that all the coefficients are equal to zero. Only by using model specification (3) can we reject the null hypothesis, since we have an F-test statistic above 10. In model specifications (4)-(10), we fail to reject the null hypothesis and therefore have weak instruments in those cases.

By using English as a primary language as instrument, we still have the same qualitative results as from (1), however the standardized coefficients are now larger. Using the estimators from the 2SLS, we might still have biased estimators but they should be consistent since this is a large sample.

Across the different samples, the regional variables of Asia and the Middle East are significant no matter which instrument is used. Both regions hold less debt as compared to the developing countries of Oceania, Central and North America holding all else constant.

5. Conclusion

The primary issue to examine in this paper was whether corruption can explain movements in the debt stock of developing countries. With the preliminary model, a significant coefficient was indeed obtained for the corruption measure used. To remedy an endogeneity problem with corruption, an instrument of ethnolinguistic fractionalization was found useful. These results were robust to the preliminary model. This paper finds that variability in the debt stock can be partly explained by variability in corruption.

The major source of indeterminacy regarding the validity of English as a primary language instrument is the possible endogeneity problem of the aid variable. However, I have attempted to show potential ways of solving the endogeneity problem and leave it open to further research to suggest good instruments for aid.

A discussion on this matter has only been initiated by this paper. More research to further understand this issue is greatly needed. First, it would be interesting to include a

differentiation between the different creditors. The reasons for giving loans to developing countries are most likely not similar between IFIs, governments and private banks. Furthermore, the variety and terms of the loan also varies between the creditors. After the Asian crisis, more have been critical of short-term loans and its effect on developing countries. This literature strand could prove useful to further the examination of corruption and its influence on debt. From a policy perspective, it would be most interesting to track the advancement of certain developing countries. If it is confirmed that countries that improve their corruption problems over time have better access to loan funds, it could serve as a great motivator for governments to target and combat corruption more effectively in the future.

Nowhere in this paper, has a causal link been established between debt and corruption (or other explanatory variables). What I claim is that the debt holdings of developing countries vary with its corruption level. The IFIs and governments that today stress good governance, do seem more restricted in their lending when it comes to more corrupt countries.

Appendix A: Data sources and descriptions

Name	Variable	Sample size	Source	Description
ln_debt	Debt	128	OECD	Natural log of total gross external debt in $ mill.
corr_gmv	Corruption	128	Government Matters V, Kaufmann et al (2006)	A subjective measure of corruption based on opinion. Ranges from -2.5 to 2,5, where the higher the number the lower the corruption.
aid_gdp	Aid to GDP ratio	128	OECD	Total aid received in US $ mill. as a ratio of income
ca_gdp	Current account to GDP ratio	128	IMF, WEO 2006	Current account in US $ mill. as a ratio of income
gdp	GDP	128	IMF, WEO 2006	GDP in current US $ mill.
dem_dum	Democracy dummy	128	DPI, Beck et al (2005)	Using the variables FINITTRM, MULTPL? and MILITARY, if either indicated non-democratic properties, the variable was coded 0, and 1 otherwise.
afr_dum	Dummy for Africa	128	The World Bank	All regional dummies were classified using the World Banks classification system.
asia_dum	Dummy for Asia	128	The World Bank	
me_dum	Dummy for Middle East	128	The World Bank	Iran has been included in this dummy rather than the Asian dummy.
eur_dum	Dummy for Europe	128	The World Bank	Countries that can be regarded as transcontinental that are included here are: Armenia, Azerbaijan, Georgia, and Turkey.
sa_dum	Dummy for South America	128	World Bank	
engfrac	Ethnolinguistic	105	Hall and Jones	The fraction of the population speaking English as their first language.
eurfrac	Ethnolinguistic	105	Hall and Jones	The fraction of the population speaking another Western European language other than English as their first language.
lat	Latitude	105	Hall and Jones	The distance from equator to the capital of the country.
sm	Settler mortality	56	Acemoglu et al. (2001)	How difficult it was for European settlers when they first arrived to New World countries.

2002 is the latest year all data are available for and hence the year the cross-country analysis is carried out for.

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