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1   Introduction

A strong emphasis on capital accumulation has become apparent in the development economics discourse in recent decades, not least when considering the question of foreign aid effectiveness. Yet, countries accumulate capital at different paces and with varying effectiveness (see e.g. de Soto, 2000). The quality of a country's institutions, defined as 'the social, economic, legal, and political organization of a society' (Acemoglu & Johnson, 2005, p. 950), is believed to play a key role in explaining this phenomenon.

At present, there is a growing body of evidence suggestive of the primacy of institutions over other factors in economic development (North, 1981; Rodrik, Subramanian & Trebbi, 2002; Acemoglu, Johnson & Robinson 2001). Studies typically find that other development factors are insignificant once institutions are controlled for or that they only affect growth positively for some minimum level of institutions. Put differently, sound institutions are generally believed to *precede* growth.

The question of foreign aid's impact on economic growth is a reasonably well-researched phenomenon, but the results have been quite disappointing. Different researchers have presented contradicting results, none of which have pertained over extensive peer scrutiny and no clear consensus has materialized. Numerous assessments of the effectiveness of different types of foreign aid as well as aid's interaction with some *specific* institutional variable have been tested, such as economic policies in Burnside and Dollar (2000) and democracy in Svensson (1999). A possible interactive impact of *general* institutional quality and foreign aid on economic growth remains unexplored at this point.

It is important to extend today's debate to dealing with more general definitions of institutions in a first stage, since 'good institutions' proxies such a wide array of desirable qualities, most of which subsequently could be explored in further detail. This thesis adds to the limited available information on institutions and their interaction with foreign aid. The author considers this topic worthy of attention since it represents an unexplored but important niche in development economics.

1.1   Purpose

The purpose of this thesis is to analyze the relationship between Official Development Assistance (ODA), institutional quality and economic growth, by means of panel data and cross-sectional regressions. The study aims to shed some light on the possible interactive forces between the aforementioned factors and to suggest possible paths forward in the foreign aid effectiveness research.

1.2   Outline

The first section gives a short background to the problem. Section two outlines related previous research. The third section presents the theoretical framework utilized to analyze the data. The forth section presents data sources, estimation methods descriptive statistics and an in-depth empirical analysis. Section five concludes and gives some hints for future researchers.

1.3   Definitions

In the introduction, institutions were defined as different types of organization of society. It is, according to this view, important to differentiate between *institutions* and *organizations* active within those institutions. (North 1981)

One might, in this sense distinguish *formal* institutions from *social* institutions, where the latter have been the basis for discussion thus far. In this sense, a functioning democracy does not imply good institutions ipso facto. When addressing institutions as a concept throughout this text, the author will be referring to the definition given above. The question of how to measure institutions will be briefly addressed in the empirical part, where the concept will be somewhat altered to allow testing.

The Organization for Economic co-Operation and Development (OECD) define ODA as any transfers from official sources (i.e. government entities) to developing countries. The transfer must be concessional in nature, conveying a grant element of at least 25 percent. In reality the transfers are virtually always all grants. (Boone, 1996) Throughout this text, the terms *aid* and *foreign aid* will be frequently used. Epistemologically, these can be different from ODA, but will in the strict sense denote the same thing, unless otherwise stated.

1.4   Background

The past decades have seen institutional approaches increase their influence over economic writings. North (1981) distinguishes a *contract* theory from a *predatory* theory of state formation. The former is described as primarily engaged in the core functions of government; to protect its citizens, to facilitate the enforcements of contracts and to secure property rights, whereas the latter functions to transfer resources from one group of people to a privileged class of elites (North, 1981). It has been shown that citizens of the contract state will invest more in productive capital and will use those factors more efficiently, rendering higher levels of income (Acemoglu et al., 2001).

Some authors – like North (1981) – use the term institutions in the very broad sense, to include culture, trust and other intangible traits of society. Others – such as Acemoglu et al. (2003) – have restricted the term to deal more or less exclusively with protection of private property rights. Hence, a dictatorship can according to some measures have excellent 'institutions', should the dictator choose to respect private property, which is to say that a good indicator for institutional quality is not always equivalent to a state of democracy (Glaeser, La Porta, Lopez-de-Silanez & Shleifer, 2004). The author of this paper will reassess this question below, in the section on how to properly measure institutions.

The contract-predatory framework is utilized in Acemoglu et al. (2001), where different formations of contemporary states are traced back to their colonial origins. European settler mortality rates are used to explain how countries with similar conditions could end up with radically different types of institutions. The authors show that in conditions where many settlers perished, extractive institutions where put in place to haul out natural resources, whereas if conditions were better, contract institutions were eventually put in place to ensure property rights. Settler mortality rates have been demonstrated to be negatively associated with economic growth rates and positively correlated with macroeconomic instability and crises. (Acemoglu & Robinson, 2005; Acemoglu, Johnson, Robinson & Thaicharoen, 2003)

Such findings provide guidance in causality matters; the fact that observations made hundreds of years ago are such a good estimators of modern-day economic performance indi-

cates how powerful the effects of institutions are and underlines the importance of a broadened view of their functions. Consequently, Kaufmann, Kraay, Lora and Pritchett (2002) find that the causality is likely to go *from* good institutions *to* economic growth. Such connections can help explaining why rich countries colonized more than five centuries ago are now poor and vice versa, in what has been referred to as *the reversal of fortune* (Acemoglu, Johnson & Robinson, 2003).

Rodrik, Subramanian and Trebbi (2002) investigate three different economic factors and their impact on income levels and conclude that institutions has primacy over both trade and geography in such a context. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999) asserts the link in between a wide array of indicators of institutional quality and economic performance and finds that societies utilizing French or socialist law or are characterized by hierarchical religion and ethnolinguistic heterogeneity will exhibit worse economic performance.

Easterly and Levine (2002) find no effect of climate and germs on economic development, other than through institutions and also find policy's effect on income levels[1] insignificant once institutions are controlled for. Consequently, Dollar and Kraay (2003) argues for the very long-run effects of good institutions.

Easterly and Pack (2004) make a crucial distinction between capital and capital accumulation by noting that low investment is not the constraint on African development, but that investment on the African continent is simply not productive. Knack and Keefer (1995) investigate the causes of growth and investment and specifically argue for the importance of property rights and protection against expropriation and contract enforceability. De Soto (2000) estimates that the world's poor possess about $9 trillion in *dead capital*; wealth not properly protected under private property law and adds to the puzzle by suggesting that investments are aggravated under such conditions foremost because of inability to use private property as collateral when applying for loans.

There are, however, alternative views on the causal relationship between institutions and development. Glaseser et al. (2004) conclude that this link is very hard to establish and argues that human capital may precede institutions and that institutions may be a product of rising incomes; a clash which could be explained by conceptual problems with some measurements used. Djankov, Glaeser, La Porta, Lopez-de-Silanes and Shleifer (2003) argue that societies have very different possibilities and that any evaluation must consider that, thereby refuting one size fits all measures of institutional quality.

The above provides an interesting platform for empirical evaluation connecting foreign aid disbursements with growth. If institutions precede growth, then out of any exogenous factors to stimulate the aid-growth relationship, institutions should be first in line.

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[1] Naturally, policy does affect short-term growth rates.

2 Previous studies

Since Boone (1996) there has been a vibrant debate over aid effectiveness. It is not the intention of the author to speculate over what has been right and what has been wrong in the work of previous researchers, but related previous studies are outlined below to provide an introduction to the problem. Well-cited studies dealing explicitly with some type of institutional variable in conjunction with aid effectiveness have been included together with the main criticism of those studies.

First of all, as concluded by Alesina and Weder (2002) and Svensson (2000) there is no tendency for countries with sound institutions to receive more foreign aid, but rather, strategic interests and other factors seem to affect donors' decisions.

There is a vast amount of studies conducted on the relationship from foreign aid to democracy and corruption, but as noted this is not true for the explicit connection between generally good institutions and the effectiveness of foreign aid. Notwithstanding, numerous scholars have assessed potential links to some type of specific characteristic or organization within the web of social institutions. Needless to say, many of these are likely to be correlated with a general measurement.

The single most influential case for aid effectiveness is the good policies approach put fort in Burnside and Dollar (2000), where inflation control, openness to trade and sound fiscal policies are identified as key factors in explaining how foreign aid can contribute to economic growth. By interacting foreign aid disbursements with a vector of policy variables, the authors finds the combined effect of policy and foreign aid on growth to be positive and significant. Interestingly, the authors include some control variables for institutional quality, including M2 over GDP, a common proxy for financial depth and assassination attempts, used to measure political instability. The study finds political stability significant and positively associated with growth but does not interact any of the variables with aid[2] (Burnside & Dollar, 2000).

The good policy framework has been extensively criticized. Notably, Roodman (2007a; 2007b); Easterly, Levine and Roodman (2004) and Dalgaard and Hansen (2001) all fail to find any relationships between good policies, aid and growth, when extending the datasets and testing for different time periods.

Svensson (1999) extends on the good policies framework by suggesting that the Burnside and Dollar approach might act as a proxy for a democratic state of affairs. Svensson (1999) finds democratic accountability to be positively associated with growth when interacted with foreign aid disbursements.

Chauvet and Guillaumont (2001) further assert that aid has a potential benefit of dampening economic shocks and is more effective in difficult economic settings, such as situations with volatile terms of trade and political instability. Roodman (2007a) is unable to replicate the results of Chauvet and Guillamont (2001) using extended datasets. Rajan and Subramanian (2008) fail to find any relationships identified in previous research in a cross-sectional panel data study.

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[2] Rajan and Subramanian (2008) uses the M2/GDP measure and finds no effects from aid on growth *after controlling* for institutions.

While most scholars assume that institutions *in general* change very slowly (or not at all) over time, a few have suggested that aid might have detrimental effects on some type of organization active in the institutional environment, normally related to direct governance or democratic accountability.

Djankov, Montalvo and Reynal-Querol (2008) go so far as to labeling the phenomenon 'the curse of aid', claiming that the negative impact of rent-seeking behavior resulting from foreign aid inflows is even bigger than that of oil. Yet others have presented evidence that aid postpones reform. Heckelman and Knack (2007) perform tests over the 1980 to 2000 period and concludes that aid has had depressing effects on market-liberalizing reform.

Rajan and Subramanian (2007) and Moss, Pettersson and Van de Walle (2006) raise a similar concern and remarks that big aid inflows might render recipient governments less dependent on tax revenues and further may discourage government officials from investing in effective public institutions. Bräutigam and Knack (2004) reinforce this concern by noting how aid inflows are associated with lowered tax revenues as well as with deteriorations in governance overall. Arguably, most researchers agree that no country will benefit from ever-increasing aid inflows. That is, if foreign aid is effective it is likely subject to diminishing returns.

A critique that will be reassessed in the analysis part is voiced in Roodman (2007b): most studies dealing with interaction variables, such as Burnside and Dollar (2000), have been plagued by estimation problems that may explain the difficulties in replication of the positive results.

3   Theory

The author assumes neoclassical growth with decreasing returns to capital following Solow (1956) in order to reduce the analysis to its bare bones. By imagining a very simplified economy with a benevolent and all-knowing social planner, it is intuitive to see how foreign aid should work in the absence of political considerations. Rajan and Subramanian (2008) and Burnside and Dollar (2000) among others use a similar approach, outlined approximately as follows. Assume that the utility of a random consumer is given by:

$$\sum_{t=0}^{\infty} \beta^t \frac{(C_t - \overline{C})^{1-\gamma} - 1}{1 - \gamma} \tag{1}$$

In (1), C_t denotes consumption at time t, $0 < \beta < 1$ is the discount factor and $\gamma > 0$ is the coefficient of relative risk aversion. Further, $\overline{C}$ represents fixed consumption, easier thought of as subsistence consumption. A subsistence level of expenditure is included to illustrate the positive correlation between income levels and savings rates (Burnside & Dollar, 2000).

The intended function of foreign aid can be easily understood by means of Solow growth accounting, built around a Cobb-Douglas type production function. In the absence of foreign aid GDP at time t is equal to AK_t^θ, where K_t denotes time-t capital $A > 0$, $0 < \theta < 1$ and the savings rate equals I_t / Y_t. To weave in foreign aid, a planner is maximizing subject to a constraint on resources, which then becomes:

$$C_t + I_t \leq AK_t^\theta + F_t \tag{2}$$

Where, in equation 2, K is time-t capital, I_t is time-t investment. Further, F_t represents foreign aid at time t, which then goes right into the budget. Now, assuming depreciation of capital at rate δ, capital one period from now is denoted:

$$K_{t+1} = (1 - \delta)K_t + I_t \tag{3}$$

That is, the savings and investment needed to replace worn down capital can be expanded by inflows of foreign aid and such investment only takes place when the subsistence needs are met.

Now, one of the obvious problems with this reasoning is that planners are not always benevolent and when they are, the red tape might be working against them. However, in a situation where institutions are perfect there is in reality very little corruption and the willingness to save and invest are good, which is to say that *what a perfect situation like this presupposes is generally perfect formal institutions*. Naturally, this is not equivalent to saying that good institutions guarantee aid effectiveness, but taken together with the proposition that institutions precede growth, a good environment from such a viewpoint creates as close to the optimum conditions as an economy can realistically get. This allows (2) to be augmented for institutional quality and can henceforth be rewritten as:

$$C_t + I \leq AK_t^\theta + BF_t \tag{4}$$

Where, $0 < B < 1$ is an institutional measure such that 1 equals perfect institutions. If the institutions variable is 0, the entire inflow of foreign aid will be annihilated, e.g. through ex-

tensive corruption, withered away by inflation or unable to bring about growth since property rights are non-existent in the first place.

According to this view, foreign aid inflows can push a capital deprived recipient country towards its steady-state growth rate. Another commonly voiced case for foreign aid cooperation is the potential of *improved* steady state growth rates through increased technology, through inflows of know-how in production and governance.

The above constitutes a framework for understanding why institutions are likely to be important in the aid effectiveness debate as well as a justification why this type of enquiry is a necessary endeavor.

4 Empirics and data

In most cases where there is conceptual disagreement over an issue one will encounter diverging views on how to measure the phenomenon in question. Institutional approaches to economics are no exceptions. Glaeser et al. (2004) criticize different subjective measures like Polity IV for measuring outcomes of choices (e.g. by a dictator) rather than underlying facts and for being quite volatile.

Following the reasoning put forth in the background section, the author of this thesis has decided to use several alternative measures that tracks the level of corruption, to what extent a country has contract institutions or extractive institutions and to what extent the citizens have confidence in the state to protect their private property and to enforce contracts.

Contract-Intensive Money (CIM) is a concept developed in Clague, Keefer, Knack and Olson (1999) and acts as a proxy for contractual enforcements and private property rights. CIM is the variable used for the base regression below and is a widely available, objective measure defined as the ratio of non-currency money to the total money supply and will approach 1 as confidence in the banking system increases and as the willingness to do business transactions in cash decreases. As stated, this concept is aimed at measuring *formal* institutions. It is however the belief of the author that it will also constitute a reasonably good proxy for *social* institutions such as trust. In any case, as reasoned by Knack and Zak (2001), good formal institutions might offset some of the negative effects from a bad social institutional environment.

European settler mortality is presented in Acemoglu et al. (2001) and documents the living conditions for European settlers arriving to a new colony. Where many settlers perished extractive institutions were put in place and where living conditions were favorable, contract institutions emerged, so that a high settler mortality rate will indicate an extractive institutional system. Settler mortality measures the amount of deaths per thousand arriving settlers, including their replacements, which makes possible the peculiarity that some countries have a rate of well over a thousand.

Alesina, Devleescauwer, Easterly, Kurlat and Wacziarg (2003) compile a comprehensive index of ethnic fractionalization for a wide array of countries. The figure is a good proxy for political disturbances, corruption and other related variables. It will be used here to control the robustness of the findings.

Data have been collected for 82 developing countries from 1960 to 2006, the selection being identical to that of Rajan and Subramanian (2008). The following data sources have been used to compile the dataset:

- M2 and Currency in circulation from IMF (2008)

- Settler mortality rates from Acemoglu et al. (2001)

- Ethnic fractionalization from Alesina et al. (2003)

- Growth rate of GDP per capita, ODA as a percentage of GDP, Nominal GDP, Import and Export shares of GDP, Inflation (GDP deflator), CO_2-emissions, population growth, external debt as a percentage of GDP and military spending as a percentage of GDP from World Bank (2007).

The dataset is cross-sectional in nature and has an added time dimension (panel data). There are drawbacks to this method like any other, but it is clearly superior to cross-

sectional estimations in at least one aspect: it addresses endogeneity issues by correcting for country and year specific effects.

4.1   Descriptive statistics

From 1960 to 2006, the countries in the sample grew at a mean rate of 1,56 percent as compared to 1,02 percent for the period after 1980. On average the countries in the sample received foreign aid amounting to 5,8 percent of domestic GDP. In the period after 1980 the corresponding figure was 6,7 percent.

The mean CIM measure for the recipient countries was 0,54 for the full period as compared to 0,56 for the period after 1980, while approaching 0,60 in recent years, indicating that public confidence in authorities has increased steadily over the reported period.

Hence, growth rates slowed down somewhat, while institutional quality increased quite steadily over time. Do note how this may indicate some support for the neoclassical assumptions outlined in the theoretical part. Poor countries may have grown faster for low levels of capital to labor ratios, that is exhibited some tendencies to diminishing returns to capital.

The development is illustrated in Figure 1, which outlines development in institutional quality and mean growth rates among the countries in the sample over the full reporting period. As can be seen from the picture institutional quality was strengthened over time, but does not appear to have any apparent relationship to elevated growth rates.

Figure 1. Institutions (bars) and economic growth (line), 1960-2006
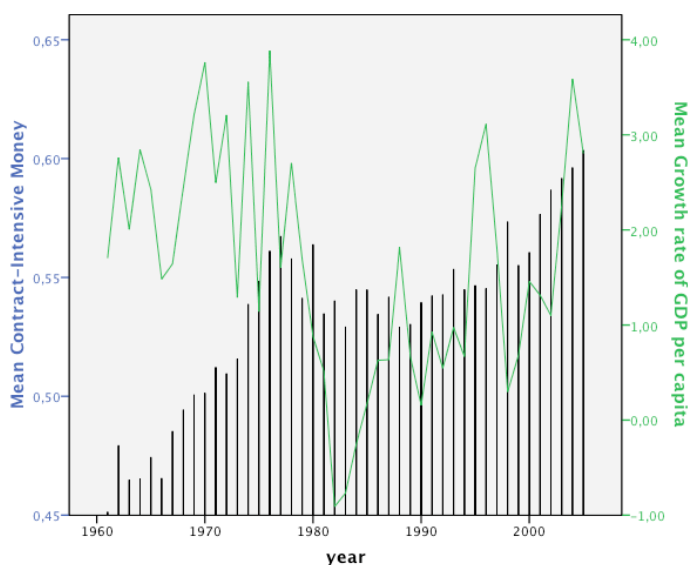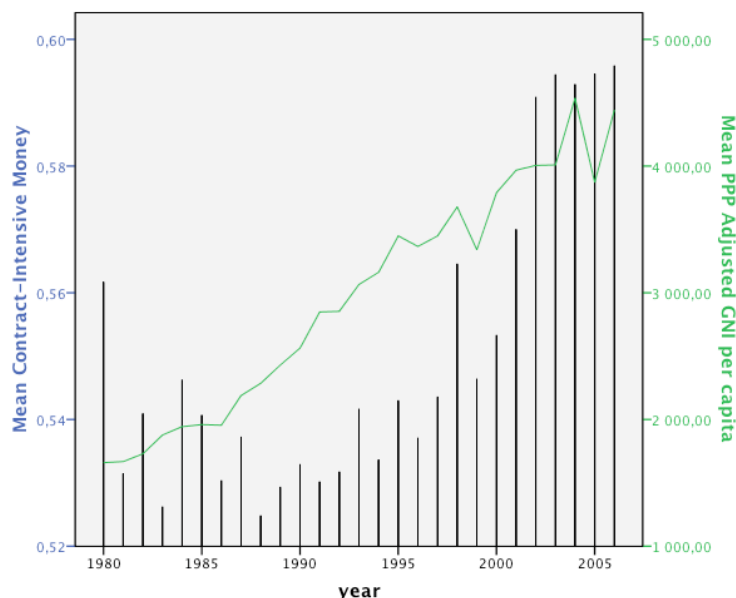

Sources: IMF (2009); World Bank (2007)

It is apparent how growth rates show some signs of a u-shaped development with a trough around the mid 1980's, with peaks in the beginning of the graph in the late 1970's and subsequently in recent years. Naturally, it might be the case that the dataset represents a snapshop of a bigger picture with growth rates are oscillating around the 2 percent level.

Figure 2 graphs the sample mean income in PPP adjusted GNI per capita against developments in institutional quality since 1980. As is obvious from the figure, both values in-

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creased over time. This is important information to keep in mind in empirical analysis of these figures, since problems with endogeneity are likely present and cannot be fully controlled for.

Figure 2. Institutions (bars) and income (line), 1980-2006

Sources: IMF (2009); World Bank (2007)

Hence there is a clear common trend among institutional quality and *income levels* but no apparent relationships between institutions and *growth rates* of incomes. It is apparent how short run growth rates are a product of a much more sophisticated set of variables than just institutions.

4.2 Specification

Including settler mortality in the model does not radically alter the results, but decimates the sample by about 50 percent. The variable has therefore been excluded from the final empirical specification. Year dummies and country dummies are included in the regressions to filter out year specific and country specific effects, where in particular the former have been substantial.

Drawing on (4), the base-line specification is outlined as follows:

$$g_t = \alpha + \beta_1 F_t + \beta_2 B_t + \beta_3 F_t B_t + \beta_4 \rho_t + \beta_5 \lambda_t + \beta_6 \ln \tau_t + \beta_7 g_{t-1} \qquad (5)$$

g = growth rate of per capita GDP

F = Official Development Assistance over GDP

B = Institutions, CIM

ρ = Openness

λ = Inflation, GDP Deflator

τ = Population

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Following the reasoning outlined in (4), that is, provided aid is affected by institutional quality, this makes possible the calculation of the marginal effect of ODA by taking the derivative of the growth equation with respect to aid:

$$\frac{\partial g_t}{\partial F_t} = \beta_1 + \beta_3 C \qquad\qquad (6)$$

The sum of aid's impact on growth is the magnitude of its original impact in addition to the combined impact with institutions.

4.3   Findings and discussion

At this point the expected sign of the ODA / GDP (aid) variable is to be regarded as indeterminate, but recalling that an aid disbursement has been predicted to diminish with deteriorating institutional quality in (4) a positive ODA x Institutions interaction term is a reasonable assumption. Interestingly, it is negative and significant in estimation 1 in the appendix, where the results of (5) are displayed. Estimation 2, displaying the outcome of the 1980-2006 regression, reveals similar results.

Recalling (6), these results are peculiar. At this point, some might recall the finding of Chauvet and Guillamont (2001): aid is more likely to be effective in difficult economic settings. Regardless of that being true to reality or not, it refers to short-term exogenous shocks, natural disasters and volatile terms of trade, not to bad governance and definitely not to long-term corruption or fear of expropriation. Interpreted literally, the results would mean that aid is more effective (if at all) in a state of deteriorating institutional quality.

Inspection of table 1 below can offer some insight into the potential problems with correlations in between some or many of the independent variables, commonly referred to as multicollinearity, and – as will be returned to – can introduce unacceptable levels of uncertainty (or even complete randomness) to regression results.

Table 1. Pairwise correlations among the regressands.

	ODA / GDP	Institutions	ODA x Institutions	Openness	Inflation	Ln Population	Lagged growth
ODA / GDP		-0.109554	0.930778	0.087821	-0.021060	-0.260467	-0.111593
Institutions	-0.109554		0.090811	0.216985	-0.069445	-0.048913	0.029403
ODA x Institutions	0.930778	0.090811		0.124174	-0.031098	-0.263222	-0.115027
Openness	0.087821	0.216985	0.124174		-0.054193	-0.421475	0.064612
Inflation	-0.021060	-0.069445	-0.031098	-0.054193		0.046079	-0.090088
Ln Population	-0.260467	-0.048913	-0.263222	-0.421475	0.046079		0.079221
Lagged growth	-0.111593	0.029403	-0.115027	0.064612	-0.090088	0.079221	

Near collinearity potentially poses a threat to the reliability of the results if *'some or all the X variables are so highly collinear that we cannot isolate their individual influence on Y'* (Gujarati, 2003, p. 349). This is a vital remark, since numerous related studies in the past that have dealt with interaction terms most probably have been plagued by serious multicollinearity, which is a big contributing reason to the fact that many previous findings have proven impossible to replicate (Roodman 2007b).

Gujarati (2003) further suggests that multicorrelation is potentially a serious problem when pairwise correlations are in excess of 0.8. Hence, the correlation of the cross-term with the ODA figure and the institutions variable is unreasonably high. This is, however, not a suf-

ficient criterion for establishing whether multicollinearity is problematic or not (Gujarati, 2003).

To test whether these problems are present the variables denoting ODA over GDP and CIM have been centered: the mean values for each variable have been subtracted from the value of each observation.

Centering the variables lowers correlation to more acceptable levels of 0.67 for ODA and 0.62 for Institutions. This is indeed an important justification for performing this study in the first place. Since collinearity has been an issue in much of the old research, documented lack thereof constitutes an interesting point of departure.

The new results are presented in table 2. These results are surprisingly robust to some modifications in the model and dataset, such as exclusion of potential outliers, different time periods and inclusion of various other control variables where the latter can be seen from the additional estimations 5 and 6 in the appendix. The aid variable is insignificant and the ODA x Institutions variable remains significant and negative.

Table 2. Overview of base-line specification results with centered variables. Dependent variable: growth rate of GDP per capita.

	1960-2006	1980-2006	2000-2006 (CS)
Constant	4.427*	3.084	3.352
ODA / GDP	1.527	1.446	-2.554
Institutions	-0.592	-0.15	-0.539
ODA x Institutions	-0.024*	-0.022*	-0.023
Openness	0.021**	0.025**	0.004
Inflation	-0.000**	-0.000**	0.054
Ln Population	-2.813*	-1.358	0.254
Lagged growth	0.084**	0.073**	0.490**
R-Squared	0.24	0.34	0.22
Observations	1653	2433	261
* = p < 0.05			
** = p < 0.01			

Naturally, it is not the case that states with fewer checks and balances, higher corruption among officials and arbitrary private property legislation are generally better at achieving aid-fueled growth, but more probably, some type of endogeneity problem makes further analysis impossible, more of which will be addressed further down. As can be seen from the appendix the aid variable is more often than not negative and significant when the CIM-ODA interaction term is excluded or replaced. In light of these figures, clearly (6) makes no sense.

As predicted by Roodman (2007b) the results are quite fragile to changes in the key variables. For example, meddling with the interaction-term sometimes produce very different results – as does excluding it altogether. However, keeping the corrected variable stabilizes the regression results and makes replication possible over different time periods, albeit with the unexpected sign.

By having a look at estimation 3 in the appendix it is striking how the expected results are produced when institutions are proxied by ethnic diversity instead of CIM. These results are not replicable to other time periods as is demonstrated in estimation 4. They are also

sensitive to changes in the control variables. Quite possibly the interaction term, in this case is highly correlated with the other key variables and produces random results.

Hence, the results are rather conclusive with the findings in Rajan and Subramanian (2008), Roodman (2007a) and most other general conclusions outlined in the background and previous studies sections. Notably, the testing cannot ascertain whether or not the effects of aid on growth is significantly different from zero. In light of (2), there are no signs that foreign aid efforts have been successful in the process of financing enough investment to bringing about economic growth.

Further, the institutions variable itself is insignificant, which is what most of the literature reviewed in the background part would predict. Institutions have been found to have a positive effect on income levels, but is rather static over time and hence not a realistic explanatory factor for short-run growth rates, which are normally quite volatile.

This is easily grasped by recapitulating the figures in the descriptive statistics part above: even though institutional quality clearly improved over the past decades, the figure appear sluggish in comparison to the very volatile growth rates on a year-to-year basis in figure 1, while their correlation to income levels seem much clearer in figure 2. Also recall that Acemoglu et al. (2001) could explain contemporary income levels and state performances quite well with the help of centuries-old figures over colonial origins.

The control variables openness, past growth rates and inflation rates all exhibit signs of being rather good predictors of short-term growth rates, which is quite well in line with intuition as well as with findings in previous research. Admittedly, it might be the case that panel data regressions are not the best available method to apply on the problem at hand and normal cross-sectional testing is also common in the literature, e.g. in Rajan and Subramanian (2008), wherein it is explicitly argued that cross-sectional tests are best suited for the problem.

Switching to cross-sectional testing over various time periods, such as row 2000-2006 in table 1 or 1995-1999 (estimation 9) in the appendix does not produce drastically different results except for the institutions-aid cross-term being insignificant. Further, openness, inflation and population also fail to predict growth in this setting. Experimenting with time periods results in few changes, apart from the ODA over GDP variable sometimes emerging as negative and significant – a common endogeneity problem often encountered in previous research[3].

This latter result – that the cross-section cannot discern any systematic effects on growth from aid – is comparable to the findings in Rajan and Subramanian (2008) and is quite depressing reading, since changes in the Y variable from the X variables should register itself with such techniques. This undoubtedly strengthens the proposition in much of the previous research that it is indeed hard to establish effects from foreign aid disbursements on growth levels.

In summation: at this point the author, not least supported by the results of the cross-sections, is in agreement with much of the previous research insomuch as any robust effects on growth from aid are concerned. The obvious question for further investigation is why this is. The author proposes that the various reasons suggested in the previous re-

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[3] I.e. that aid can tend be disbursed to countries that are behaving badly for various reasons.

search may be the divided in two sub-categories: reasons exogenous to the foreign aid issue, and reasons embedded in the system, henceforth referred to as endogenous factors.

4.3.1 Exogenous factors

A natural reason for this might be the difficulty involved in modeling growth over large sample sizes. Having a look at the goodness of fit (R-squared) values on any similar regression offers some support for this hypothesis in that they are virtually always quite low, normally in the range from 0.25 to 0.40. It can of course be the case that some ingredient is missing before enough information on the effects of foreign aid are fully known.

Further, the assumption made in the theoretical framework may have been a bit rash. Since institutions do proxy related topics, notably corruption, they are not likely to be totally irrelevant, but may on the other hand not be ideal either. As mentioned, 'perfect institutions' in the sense that CIM approaches 1 does not per se equal 'perfect democracy' or even 'absence of corruption', it merely indicates confidence in the system, though some degree of totalitarianism or corruption may still be present. Perhaps institutions could be measured by checks and balances or malapportionment. This remedy would require a significant leap of faith though and would most probably bring similar problems with it – also bear in mind that two further concepts aimed at measuring related issues – settler mortality and ethnic diversity – failed to produce different results.

As argued above, multicollinearity has been a persistent problem in the previous research and has rather likely driven the results in many previous studies. After correcting the sample this is probably not the case here, although the results are essentially the same as would have been obtained with uncentered variable as can be seen from estimations 1 and 2 in the appendix. It is nonetheless interesting to observe the wildly fluctuating signs of estimations 3 and 4 in the appendix, where institutions are measured by ethnic diversity.

A fact that does not strengthen the proposition that institutions are good for aid is the stability of the results in their refusal to deliver positive and consistent results. Since the variable acts rather robust so long as the non-collinear setting is used it certainly casts a shadow of doubt on the theoretical background to the problem, although not refuting it altogether. As noted, it is still probable that some sample problems are present in table 2 and taken together with the various results in the appendix, they are a pretty good illustration of the warnings in Roodman (2007b) referred to above.

In short, the problems with multicollinearity have likely been remedied, but some other forces persist in producing erroneous and sometimes absurd results.

4.3.2 Endogenous factors

The problem with this approach is obvious: since aid efforts have been well-documented for 50 years, then after trillions of dollars it should have been possible to see some results under a certain set of circumstances. Hence, another reason for the absence of results may be that aid in the broad sense is simply not effective.

Aid to extremely corrupt regimes is not likely to be effective in boosting growth since fights over resources and rent-seeking behaviors is likely to emerge – a phenomenon explored e.g. in Djankov et al. (2008). But a growing body of evidence also suggest that aid in practice might not have the prerequisites to be effective in the first place due to crowding out effects and other problems intrinsic to the system (Roodman 2007; Rajan & Subramanian, 2005). Indeed, about a hundred peer-reviewed papers have been published on the aid

effectiveness issue and if there is a consensus, it is that aid has not been effective (Doucouliagos & Paldam, 2005).

Borrowing a term from Mosley (1987), this may be characterized as the *micro-macro paradox* standpoint; that regardless of successful execution of specific development projects, economy-wide progress has not materialized. That is, regardless of institutions being perfect or not, aid may simply not be effective when considering its net effects – which is really the only sensible position.

A commonly voiced potential reason for this is supported by the conclusions in Rajan and Subramanian (2005) and is described as the tendency for aid inflows to trigger a real exchange rate overvaluation that is not observed in the case of private remittances. This reduces the competitiveness of the export sector and may thereby hamper growth, in despite of proper implementation in a country with a sound structure of formal and informal institutions. This phenomenon is commonly referred to as the Dutch disease of foreign aid, but has unfortunately been largely ignored in the aid effectiveness literature up to this point (Doucouliagos & Paldam, 2005).

The endogenous type of critique is of course more fatal than exogenous explanations, simply because it quite explicitly claims that the problems with foreign aid effectiveness may be beyond repair – no matter how benevolent recipient governments get or how well monitored disbursements are. Such insights have led to a situation where an increasing number of scholars make pledges to denounce foreign aid efforts altogether – the most famous of which is expressed in Subramanian (2007).

One might also suspect that poor people are more prone to holding a large share of their wealth in money. Bjørnskov (2009) identifies a related problem: foreign aid is likely to breed inflation through a Dutch disease effect, which will skew the income distribution and hence make the poor relatively worse off. By thinking about inflation as a tax on holding money, this means local elites will be relatively better off than the poor, even in the absence of corruption.

4.3.3 Extended analysis

Pondering the existence of such endogenous problems might offer some insight into the lack of significant results presented in this section and in the pile of previous research. Whether high quality institutions make aid allocation more efficient or not, the net effects might still be offset by the triggering of an exchange rate overvaluation and a subsequent weakening of the domestic manufacturing sector.

Bearing in mind that changes in the interaction term could produce substantially different results, it is not difficult to understand why David Roodman (2007a; 2007b) choose to title his critiques of the contemporary foreign aid research *The Anarchy of Numbers* and *A Guide for the Perplexed*. The main point made is that just about any desired result can be supported by regression results if the performer does not mind tweaking the estimation with uses of collinear cross-terms, triple cross-terms, squared cross terms, aid squared terms or a combination of these[4].

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[4] For example, the Chauvet and Guillamont (2001) study referred to above contained pariwise correlations of about 0.985 (Roodman, 2007b).

This analysis has put effort into fairness and consistency in the choice of interaction term and has ensured it free from collinearity to the furthest extent possible. Still, the variables have not shown any signs of acting according to theory.

As has been covered thus far, foreign aid disbursements can have detrimental effects on completely different areas of society than the one targeted by the effort, which is likely a contributing reason to the micro-macro paradox defined earlier. Failure to pay attention to the macroeconomic *net effects* of a disbursement can have unfortunate effects for the recipient country's export sector and can misallocate a chunk of the skilled labor force from their productive work to something less desirable. Therefore, any study that does not deal with the big picture must be considered with caution.

5   Conclusions

The purpose of this article is to analyze the relationship between ODA, institutional quality and economic growth. After panel data regressions and cross-sectional regressions over the past 50 years, such a relationship has not been established – a finding conclusive with much previous research on related areas. Taken together, the author has not found that good institutions interact with foreign aid to boost growth rates in the way predicted by the model outlined in the theoretical framework.

Even though the author does not claim to have punctured the valid arguments for providing aid to a strong institutional environment, the lack of significantly positive results adds to an already voluminous literature unable to prove the effectiveness of foreign aid – in despite of good theoretical reasons. Is the choice of specification the reason for this? Perhaps, but the author has attempted to avoid the pitfalls to the furthest degree possible, without results.

The reason for this has often been sought after in exogenous problems, such as corruption or lack of monitoring of results, but the author maintains that part of the problem may well be endogenous to foreign aid as a phenomenon, or some set of circumstances over the past 50 years would most probably have rendered positive and quantifiable results.

Hence, there is reason to suspect that the problem is intrinsic to the system. This issue has been summed up rather well in the micro-macro paradox of foreign aid: in despite of accurate implementation of case studies, economy-wide progress has remained hard to pin down. Some potential reasons are the Dutch disease of foreign aid and a skewing of the income distribution, tending to make the poor relatively worse of.

The Dutch disease of foreign aid refers to a situation where aid inflows triggers an exchange rate overvaluation, making the export sector relatively worse off and potentially pushing skilled labor out of productive work. The income distribution argument can be understood as the tendency for aid to increase inflation, making the relatively poor worse off since they are more likely to hold their assets in money.

5.1   Suggestions

As noted, problems intrinsic to the foreign aid phenomenon ought to be analyzed in further detail and after proper documentation, carefully implemented into policy. Dutch disease related issues and the notion of skewed income distributions resulting from disbursements are obvious examples of problems deserving an uplifted position in the research.

Suggesting extensive policy implications is beyond the scope of this analysis, but other scholars presenting similar results, such as Easterly (2003) and Roodman (2007b) have suggested a proceed with caution approach where aid is used to alleviate the symptoms of poverty, combat infectious disease and generally contribute on a here-and-there basis. This view emphasizes that no size fits all; microcredit might have been part of the solution for Bangladesh, land reform worked in some parts of Latin America and so on, but however important knowledge can be obtained from past endeavors, they cannot be utilized to deduce panaceas for poverty eradication.

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Appendix: supporting regressions

The table outlines signs of the coefficients in alternative estimations referred to in the text. Dependent variable in all estimations is growth rate of GDP per capita.

	ODA / GDP	Institutions	ODA * In-stitutions
1	(+)**	(+)	(-)*
2	(+)**	(+)	(-)*
3	(-)*	(+)	(+)**
4	(-)*	(-)	(-)
5	(+)*	(-)	(-)*
6	(+)**	(+)	(-)**
7	(+)	(-)	(-)*
8	(+)	(+)	(-)*
9	(-)	(+)	(-)

1. Base-line estimation (1960-2006) with uncentered variables

2. 1980-2006 with uncentered variables.

3. Base-line estimation (1960-2006). Institutions proxied by ethnic fractionalization (uncentered variables).

4. 1980-2006 with institutions proxied by ethnic fractionalization (uncentered variables).

5. Base-line estimation (1960-2006) with additional control variables: CO2 emissions and nominal ODA.

6. Base-line estimation (1960-2006) with additional control variables: military spending to GDP and external debt to GDP.

7. Base-line estimation without lagged independent variable as regressand.

8. 1980.2006 with lagged independent variable replaced by income levels (PPP adjusted GNI per capita)

9. Cross-section (1993-1999).

* = $p < 0.05$

** = $p < 0.01$