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# Governance, Growth, and Aid Effectiveness

*By*

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## **Abstract**

This essay examines the relationship between governance, aid effectiveness and economic growth using a newly developed governance index consisting of a variable for institutional quality from the Fraser Institute and three policy variables. The governance index is an extension to the policy index developed by Burnside & Dollar (2000). As earlier research has predicted, the author finds that aid alone has no significant positive effects on growth. However, aid interacted with governance has a significant positive effect on growth. These results are especially strong in low income countries. More importantly is that the essay reaffirms the importance of good policies and good governance on growth controlling for endogeneity problems in the variable for institutional quality and the governance, and policy indices. Good governance by itself is found to be very important for economic growth.

Keywords: Governance, Institutional quality, Policies, Aid effectiveness, Economic growth

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# 1 Introduction

One of the weapons with which the fight against poverty and inequality in the developing countries has been fought is foreign aid. With the exception of 2006 and 2007, official development assistance (ODA) has been increasing in recent years, albeit from low levels. In 2008 the ODA reached over 121 billion US\$ in current prices<sup>1</sup>. Compared to the several hundreds of billions of US\$ that rich countries set aside the following year, using it to strengthen their financial systems, then 121 billion US\$ in ODA to the developing world seems like a small piece of the cake. Compared to other measures this is a staggering amount. For example, it is equivalent to roughly 10 percent of Africa's GDP<sup>2</sup>.

But using unconditional aid as a weapon for poverty alleviation has lost its edge. In a meta study in 2008 containing about 100 papers from the 1960s and onwards, Doucouliagos and Paldam investigate what the aid effectiveness literature really tells us. Up to the date of writing, the authors have found 68 papers using direct measures on how aid affect growth and 31 papers containing conditional measures such as geography, policies etc. Since the 1970s, there has been research pointing to a zero correlation between aid and growth (ibid). In spite of the fact that many studies find a positive but weak relationship, the meta study supports the zero correlation result. To explain this, the authors coin the 'reluctance hypothesis'. They present empirical results indicating that researchers are reluctant to publish negative results due to strong normative reasons concerning aid policies.

However, this unsatisfying result do has plagued economists, since the results are not supported by theory and observations at a micro level. Because even though not all aid projects are successful, they can hardly harm economic growth can they? Furthermore, aid could be regarded as a capital injection and should therefore raise growth levels in the neoclassical growth model. This difference between theory and evidence has been coined as the micro-macro paradox by Mosley (1986). Rajan and Subramanian (2008) suggests that the zero correlation depends on data noise making it hard to establish a clear relationship in regression analysis, indirectly suggesting that the relationship is very small but still existent. However, the zero correlation has resulted in an academic quest to find the missing variable, essential for aid effectiveness, generating the 31 papers also examined in the meta study. The conclusion from these 31 papers is that the only robust relationship is the interaction between aid and institutions on growth, via its affect on investment. Another finding is a positive endogenous relationship between aid and policy where aid cause an indirect effect on growth via policy variables. Interestingly, the authors also find that aid can crowd out foreign direct investments (FDI) and increase government size. Thus, answering the above question that in the wrong environment aid does have a negative impact on growth.

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<sup>1</sup> The data are obtained from the Organisation for Economic Co-operation and Development (OECD).

<sup>2</sup> The data on Africa's GDP is gathered from the International Monetary Fund, IMF.

One reason for the inconclusiveness in the research results could be problems like lack of good data and debates about empirical and econometrical specifications<sup>3</sup>, where some economists conclude that aid has had no effect on growth (like Boone, 1996) while others argued the opposite (like Hansen & Tarp, 2001). In a very influential paper that sparked a long and refreshing debate on the effectiveness of foreign aid, Burnside & Dollar (2000) found evidence that aid affect growth, but only in a good policy environment; measured in their study by targeting fiscal discipline, inflation and trade openness.

I will in this essay reexamine the Burnside & Dollar link between aid effectiveness and growth. Such a reexamination is motivated in the light of the meta study that stress the importance of institutions. Therefore, instead of using only measures of good policies I will use a combined measure of institutional quality and good policies, which forms the governance variable. It is important to study the combined effects of institutions and policy on growth since institutional quality may be less valuable in a poor policy environment and, most importantly, good policies may be rendered useless if the institutions implementing them are weak. This indicates that there could be a strong relationship between governance and growth. The combination of both the institutional quality variable and the policy variables form a sufficient general model, so that it could capture increases in both the volume and the efficiency of investments (i.e. both the direct and indirect effects described by Aron (2000)). My main research question I attempt to answer is whether or not good governance affects aid effectiveness on economic growth.

The academic significance of the study is that while there have been numerous studies on the impact of institutions on economic development, where institutions affect growth positively via investments, not many studies evaluate the importance of institutions and governance on aid effectiveness. The exception to this gap in the research is Burnside & Dollar (2004) and Balamoune-Lutz and Mavrotas (2009).

I will in the essay use the same data set as Burnside & Dollar (2000) do in their article "Aid, Policies, and Growth" (henceforth APG), with the exception of the institutional quality variable which I get from the Economic Freedom of the World Index (EFW) from the Fraser Institute. I change the variable in order to improve the measurement of institutions over time, since the institutional quality variable in Burnside & Dollar lacks time variation. From my growth regression I create a good governance variable that captures the effect of inflation, budget surplus, trade openness and institutions on growth. To be able to direct compare the results with that of Burnside & Dollar I repeat the same estimation procedures outlined in APG. That is, I then use the governance index as a regressor in the growth equation and let it interact with aid to see if there is any positive, conditional, effect of aid on economic growth.

My main results are that aid alone has no significant effect on growth but that aid in combination with good governance has a highly significant positive effect on growth. This positive effect on growth is checked for possible endogeneity problems in the aid and governance variables and is slightly more significant than the effect that Burnside & Dollar (2000) find when they, in APG, let aid interact with policies.

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<sup>3</sup> These explanations were put forth by Burnside & Dollar in the debate that followed their article in Aid, Policies, and Growth (2000).

The purpose of this first chapter is to give the reader a coherent understanding of the main reference articles and its connection to the theoretical importance of governance when it comes to aid effectiveness. It is therefore by necessity the largest chapter in the essay. In the next part of the chapter I will first go through the basics in the APG-article and review the most important criticism against the article and its results. This part is important to understand the theoretical importance of the remainder of the essay. A brief introduction to “Aid, Policies, and Growth: Revisiting the Evidence” follows. Their results are viewed as a good complement to my essay, in the way that they provide a broader aggregate of governance measures but with a shorter time span. Thereafter a thorough motivation to the research subject is presented, and why I regard it to be more important to examine the effects of institutional quality as well as good policies (i.e. good governance) on aid effectiveness, than only good policies. Here, I argue that good policies are just an estimate of good governance and as such are determined by the quality of the underlying institutions. I follow the definition of ‘good governance’ done by Rothstein and Teorell (2005). In the final part of the chapter I present the outline of the remainder of the essay.

## **1.1 Introducing “Aid, Policies and Growth”**

In a widely used and cited paper, “Aid, Policies and Growth”, Craig Burnside & David Dollar (2000) uses a database on foreign aid to examine the relationship between foreign aid, economic policies and growth of per capita GDP. Their theoretical underpinnings are the neoclassical growth model in which aid is viewed as a lump sum transfer from abroad. Aid has a direct effect which depends on how much of the injection of aid, which raises the capital stock, is transformed to additional investments. It also has an indirect effect due to the fact that when aid raises the capital stock it also affects an economy’s location along its transition path to some long-run steady state.

The articles main contribution to the debate on economic development is that Burnside & Dollar attempt to answer two central questions whose answer could play a central role in formulating aid strategies and policy advice to developing countries. These questions are:

1. Is the effect of aid on growth dependent on economic policies?
2. Do donor governments and agencies allocate more aid to countries with good economic policies?

To answer these questions they formulate one growth equation and one aid equation. Since their main question concerns the interaction effects between aid and policy distortions, they create a policy index from the results of the ordinary least squares (OLS) regressions. They then use this index in their growth and aid equations. They also use the method of two stage least squares (2SLS) to take account of potential endogeneity problems based on feedback effects of growth on aid. The models are estimated using panel data of 56 countries and six four-year time periods from 1970 to 1973 until 1990 to 1993.

The policy index is a weighted index that consists of one variable for trade openness developed by Sachs and Warner (1995), one variable for inflation as a measure of monetary policy (Fischer, 1993) and the third and last variable is a measure of fiscal policy measured by the budget surplus suggested by Easterly and Robelo (1993). The weights with which the policy index is constructed is related to the individual variables affect on growth. This is the key feature of the index that allows a

discussion of the effectiveness of aid in a “good” and “bad” policy environment. Their two main equations are presented below:

$$g_{it} = y_{it}\beta_y + a_{it}\beta_a + p_{it}\theta_p + a_{it}p_{it}\theta_1 + \mathbf{z}'_{it}\beta_z + g_t + \varepsilon_{it}^g \quad (\text{Growth equation}) \quad (1)$$

$$a_{it} = y_{it}\gamma_y + p_{it}\phi_p + \mathbf{z}'_{it}\gamma_z + a_t + \varepsilon_{it}^a \quad (\text{Aid equation}) \quad (2)$$

Here;  $i$  indexes countries,  $t$  indexes time,  $g$  is per capita real GDP growth,  $a$  is aid receipts relative to GDP,  $y$  is the log of initial real per capita GDP,  $p$  is the policy index,  $\mathbf{z}$  is a  $K \times 1$  vector of other exogenous variables that might affect growth and the allocation of aid,  $g$  and  $a$  are fixed time effects, and  $\varepsilon^g$  and  $\varepsilon^a$  are the error terms. The motivation to include time effects is to capture the impact of worldwide business cycles.

Burnside & Dollar conclude in their article that aid has on average had little impact on growth. However, interacted with a good policy environment, a robust finding was that aid then has a positive impact on growth beyond the direct impact that the policies themselves have on growth.

The second major finding in their article is that there is no significant tendency for total or bilateral aid to favor a good policy environment in the recipient countries. Only multilateral aid, which in this sample is about one-third of the total, is allocated in favor of good policies.

One explanation for the ineffectiveness of aid given by Burnside & Dollar is that bilateral aid is strongly positively correlated with government consumption. When tested in the growth equation, following the theory of the neoclassical growth model, government consumption in itself is an insignificant variable.

### 1.1.1 Criticism of the Article

The article has had a great impact on the academic debate and it is not difficult to see why. Since the results implicate that aid should be allocated to countries with sound policies, it sends a clear-cut message to donor countries. However, because of Burnside & Dollars clear message, there have also been a lot of criticisms concerning the article.

A shift in the debate on the effectiveness of aid occurred in 1996 when Peter Boone (1996) in a study covering 96 countries and 20 years used aid data from OECD to test whether aid affects growth via investments and political regime. He concluded that aid does not increase investment, but that it does increase the size of government.

Of course, on the other end of the spectrum there are those that have found statistical evidence that aid in fact do affect growth positively. One of these studies done after Burnside & Dollars study (and partly as a response to it) is “Aid and growth regressions” by Henrik Hansen and Finn Tarp (2001). Based on a standard growth model capturing non-linear effects between aid and growth, they find that aid probably increases the growth rate via investments but that there are decreasing returns to aid. These results are not conditional on good policies but highly sensitive to the choice of estimator and the set of control variables. In later studies by Dalgaard and Hansen (2001) and Dalgaard, Hansen and Tarp (2004) the results in “Aid and growth regressions” are confirmed.

However, in a study by Collier and Dehn (2001) the authors include extreme negative shocks to the Burnside & Dollar regressions as an answer to criticism that rose from the fact that the Burnside & Dollar results are neglecting the importance of shocks. The results become more robust to the

choice of the sample, and more importantly it even becomes robust to the changes in sample made by Hansen and Tarp (2001).

The most interesting study with conflicting results compared to those of Burnside & Dollar is made by Easterly, Levine and Roodman (ELR, 2004). The study will be explained more in detail below but a quick description is that it mimics the Burnside & Dollar study with an extended data set. The results indicates that when adding new data to the study the results no longer supports the theory that aid promotes growth in good policy environments.

Worth noticing here is that the study by Dalgaard, Hansen and Tarp (2004) is using the same data set as used in the ELR study, but different econometric model. Their theoretical motivation behind the study is that poor policies do can render aid ineffective, but that deep determinants of productivity, like institutions and climate related circumstances, matters as well. If strong enough, these latter variables can offset the effects of a bad policy environment. Here, Dalgaard et al conclude that aid overall *“has been effective in spurring growth, but the magnitude of the effect depends on climate-related circumstances”*. They find that aid has been far less effective in tropical areas, and draw the same conclusion as Easterly et al. that the interaction effect between policies and growth is weak (Ibid).

A brief summarization can be done of the studies, before the study by Easterly et al. in 2004, which criticize the results in the APG article. The criticism concerns either the model specification with its theoretical foundation, the econometric method applied with its basic assumptions or the data set used (Burnside & Dollar, 2004,a). As noted earlier, one of the comments to the article that stands out (which also receives special attention by Burnside & Dollar) is that of Easterly, Levine and Roodman (2004). They use the same model specification and econometric method as in the original article but complement and extend the data set with new, previously unavailable, information. Instead of 275 observations in 56 countries they have gathered the same or very similar information with 356 observations in 62 countries, and extend the data through 1997. Thus, this extension of the data provides Easterly et al. with a very simple robustness check of the Burnside & Dollar results. The result from this extended data set is that a good policy environment no longer increases aid effectiveness. These findings are unaffected by excluding or including outliers and holds when changing sample period length.

These results hit a heavy blow to the core of the Burnside & Dollar hypothesis, and it wasn't long until they replied (Burnside & Dollar, 2004). Their main arguments against the results made by ELR are described below. Firstly, when looking at the new data they argue that one can see that it is the additional countries that are responsible for the difference in results. Many of the observations that influence the interaction variable aid\*policy most negatively can be derived to these countries. They argue that a closer analysis of these countries during the corresponding time period is needed. Secondly, assuming the hypothesis presented by Easterly et al. that the interaction term “aid\*policy” is insignificant, they find it interesting to note that the same variable but now squared is significant. According to Burnside & Dollar, this indicates that there is at least a positive but non-linear relationship between aid and growth for countries with good policies. To look at this non-linear relationship between aid, policy and growth they derive the unexplained growth as a function of unexplained aid and policy<sup>4</sup>. The results indicated that a combination of high unexplained policy and

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<sup>4</sup> First, they regress growth, policy and aid on the other right hand side variables to extract the unexplained (residual) components of each variable. Thereafter, in the second stage, they derive the unexplained growth as a function of unexplained aid and policy.

high unexplained aid implies 1.21 percent additional unexplained growth<sup>5</sup>. As a concluding remark, they refer to case studies that in their view support the idea that project money works best when the recipient government have a good set of policies to enhance growth and assist in investments.

Up to this point, I have summarized the main debate concerning the results in “Aid, Policies, and Growth”. Burnside & Dollar have with well formulated arguments managed to empirically defend their hypothesis that policies do affect aid effectiveness. Many of the other influential articles mentioned above draw other conclusions and I do not imply that the other authors by necessity are wrong. Depending on model specification and econometric testing methods aid may very well be a significant factor for economic growth and maybe good policies has a less important role to play for aid effectiveness. As a matter of fact, in the recent study by Rajan and Subramanian (2008) that takes a more comprehensive grasp on the subject of aid effectiveness, by studying longer time periods with many different model specifications, the authors find no correlation between the interaction of aid-policy and aid-geography on growth. But the cost of improved time coverage comes to the price of a more narrow definition of policies to only include the Sach & Warner openness measure (extended to include the 1990s).

This being said, a few points in the debate is worthy of extra attention since it correlates with the subject of this essay. I agree with the intuition that aid effectiveness should be improved when interacted with good policies. But the intuition presented by Dalgaard et al. (2004) is as much appealing, in where the growth effects of strong institutions can offset those of a bad policy environment. Indeed, it can easily be argued that institutions could be one of the drivers of good policy implementation and when combined creating a fertile environment for aid to work on for economic growth. In fact, in a recent study made by Balamoune-Luts and Mavrotas (2009) the authors use the same data set as Easterly et al. and examine the impact of institutional quality and social capital (where ethno-linguistic fractionalization is used as a proxy)<sup>6</sup> on aid effectiveness. They find evidence that social capital and institutional quality enhances aid effectiveness.

Since the focus in the last part of this section has been on institutions, I will in the next short section briefly recapitulate the main findings in Burnside & Dollars article “*Aid, Policies and Growth: Revisiting the evidence*” (2004) since it is one of the few articles that investigate the connection between institutional quality and the effectiveness of aid.

### **1.1.2 Expanded Role for the Quality of Institutions**

In the article “*Aid, Policies and Growth: Revisiting the evidence*”, Burnside & Dollar (2004) revisit the relationship between aid and growth from a different angle using a new data set focusing on the 1990s. The new angle is that, instead of using a policy index, they are now using a data set developed by Kaufmann, Kraay, and Zoido-Lobaton (henceforth, KKZ), also known as the world bank governance indicators, which are an aggregate of various institutional quality variables and good policy variables (Kaufmann et al. 1999). This is a shift from their previous article, APG 2000, where institutional

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<sup>5</sup> This result is significant at the 5% significance level.

<sup>6</sup> Social cohesion is used as indicator of social capital and the fractionalization variable in the Burnside Dollar/ELR data set is used as a proxy variable. Ethno-linguistic fractionalization is measured following the method in Easterly et al (2005:8) in which the probability of two randomly selected individuals not belonging to the same ethno-linguistic group is measured.

quality was only one exogenous control variable among others. Because the authors are focusing on the 1990s, the KKZ measure is ideal since it spans over 124 countries throughout the 1990s.

They find that, after controlling for initial income and the quality of institutions, there is a negative correlation between aid and growth. Furthermore, the interaction of the KKZ variable and aid is strongly positive and significant at the 10 percent level indicating that aid spurs growth conditional on good governance.

## 1.2 The Theoretical Foundations of Governance

This subchapter briefly describes the linkage between policies and institutions, in that both concepts are an integral part of in the quality of governance. I argue that both good policies and high quality institutions are important parts in a well functioning economy and that good policies in many ways are determined by the quality of the underlying institutions.

This essay uses Rothstein and Teorells (2005) definition of good governance as *“the impartiality of government institutions that implement government policies”*. They clarify by saying that *“the definition is based on the idea that a democratic system has two sides that are guided by opposing norms: partisanship for the representational process and impartiality for the process of implementation”*.

Here one can argue that authoritarian states are neither democratic in their representation nor impartial in their process of implementation. But this argument misses the point here, that in those cases they are defined as states with weak institutions. It is wrong to infer that this definition of good governance tells us that only democratic states can house institutions that practice good governance, it only reveal that only democratic systems can. In my view, this is on a sliding scale, hence the possibility of different governance measures. This is in line with, for example, the accepted importance of rule of law and enforceability of contract rights for economic growth. Another argument against this definition is that economic policies such as an inflation target has little to do with an impartial democratic system and more to do with economic factors that governs the macroeconomic space. However, this argument ignores the fact that one of the more widely accepted concepts for achieving price stability is to have an independent central bank thus allowing it to freely practice a sound monetary policy.

In the important publication *“Institutions”*, Douglass North (1991) defines institutions as *“the humanly devised constraints that structure political, economical and social interaction”*. He means that institutions consist of both informal constraints, like taboos, customs, traditions etc., and formal rules (for example constitutions, laws, property rights). In this essay I follow North’s definition of institutions with regards to the formal rules that comprise institutions, with an emphasis on the definition that institutions *“structure political, economical and social interaction”*. The inclusion of the term social interaction is important since it implicitly assumes that there is a relationship between institutions and social capital, or, between formal and informal constraints. This will be an important implication to examine later on in the essay<sup>7</sup>.

This definition may seem very vague, but it is important to note that institutions are not just formal structures and a set of rules but also mechanisms of social order and the interaction therein.

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<sup>7</sup> This relationship is examined closely in chapter 2.2

Following the above definition of good governance I argue that good policies are just an estimate and indication of good governance, since it is the outcome of the government institutions that implement government policies. As such, good policies (as well as good governance) are often determined by the quality of the underlying institutions. Another important note is that, even though good policies can be regarded as an indication of institutional quality in the sense above, good policies are sensitive to external shocks in a way that institutions are not. This issue is explored by Collier and Dehn (2001). Therefore, institutional quality could be a more robust variable when measuring aid effectiveness. Intuitively, is there really any logic behind the argument that the relative effectiveness of aid should decrease if there is a sudden price shock or a sharp decrease in the fiscal balance, conditional that sound institutions are still in place? I argue that this is not the case.

On the other hand since policies are the real outcome of government institutions they provide the researcher with the empirical output from these institutions, rather than subjective measures of the same, and therefore functions as indicators of the institutional decision-making process as well as provide enhancements by their own right.

Rooted in the theoretical argumentation in this section, I find it more important to examine the effects of good governance<sup>8</sup> rather than that of good policies alone, on aid effectiveness. Since this essentially means that I comprise institutional quality and good policies into a good governance index I find it necessary to evaluate some of the research done on institutions impact on aid effectiveness.

### **1.2.1 The Academic Research on the Impact of Institutions on Aid Effectiveness**

An important distinction is made by Janine Aron (2000) between indicators that measure the performance or quality of institutions and those that measure political and social characteristics and political instability. Descriptions on the features of political or economical institutions do not reveal anything about how well such institutions perform. In contrast, measures of quality and performance of formal and informal institutions indicate the effectiveness of existing institutional rules or norms and their implementation.

As mentioned above, in the meta study by Doucouliagos & Paldam (2008) the authors found 31 articles that confirmed a robust relationship between institutions and aid effectiveness. However, almost always have geography or language been used as a proxy for institutions. But there are two important articles that examine the relationship between institutions and aid effectiveness without using such proxies. In *"Aid, Policies, and Growth: Revisiting the evidence"* Burnside & Dollar (2004) uses the KKZ measure as a measure of good governance. They conclude that aid increases growth conditional of good governance. But the KKZ-measure is a construction of six indicators<sup>9</sup>, themselves an aggregate of a total of over 300 governance indicators. Without a doubt this is an extremely good measure of good governance, but as a measure of the pure institutional effect on aid effectiveness there is a risk of dilution by the numerous governance measures. Furthermore, because of the huge number of governance variables, no distinction in Burnside & Dollar (2004) is made between variables that measure the performance of institutions and those that measure political and social characteristics and political instability. Therefore it is hard to tell whether or not the KKZ variable

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<sup>8</sup> Good governance is in this essay represented as the combination of institutional quality and the policy index.

<sup>9</sup> These six aggregates are: voice and accountability, political instability no violence, government effectiveness, regulatory burden, rule of law, and control of corruption.

reveals the effectiveness of the underlying components or are just descriptions of their attributes. However, their results are still important and interesting. Unfortunately it fails to provide an analysis over longer periods of time.

The other article of interest in this discussion is written in 2009 by Baliaoune-Lutz and Mavrotas (henceforth BLM). In *“Aid Effectiveness: Looking at the Aid-Social Capital-Growth Nexus”* one of the variables they use are in fact the same variable, Institutional Quality (ICRG), used by Burnside & Dollar (2000). This variable was compiled by Knack and Keefer (1995) and consists of five indicators of institutional quality from the International Country Risk Guide (ICRG) surveys and four surveys from the Business Environmental Risk Intelligence (BERI). Such subjective measures are proxies for the transaction and transformation costs of production that may affect the volume and efficiency of investment and hence growth (Aron, 2000).

What BLM does is that they test whether or not institutions and social capital could enhance the effectiveness of aid independently and in combination with good policies. They use the variables ICRG and ethnic fractionalization as measures of institutional quality and social capital. By using ethnic fractionalization as a proxy for social capital, BLM encounters some important methodological problems. Since ethnic fractionalization is just a measure of a social characteristic it is hard to infer that it is only a proxy for social capital. As Aron (2000) notes, using sociopolitical measures as proxies tends to obscure the different channels through which the targeted variable (in this case social capital) operate. So the proxy for social capital does not say anything about the causal relationship to institutions. This is an important connection that I will explain in detail in chapter 2.1.2.

Using the same data set as Easterly et al., BLM first estimate the importance of institutions and then the importance of social capital and test the specifications in both the 1970-93 and 1970-97 years range including and excluding the countries added by Easterly et al. Their conclusion is that social capital and institutions enhance aid effectiveness. When controlling for social capital or institutions the impact of policies on aid effectiveness disappear.

Using the institutional quality variable from the two sources mentioned above is consistent with the definition of institutions outlined in chapter 1.2. To quote Knack and Keefer (1995:210):

*“These two sources provide detailed ratings for large samples on disaggregated dimensions of property rights that are closely related to those institutions emphasized by North”*

However, since the institutional quality variable wasn't widely available before 1980 Burnside & Dollar (2000), and thus also BLM, uses each countries 1980 figure throughout the whole time series, thus letting the variable for institutional quality to be static throughout their regressions. In the Burnside & Dollars analysis this was a smaller problem since their focus was on good policies, but when the focus of attention is on institutional quality the validity of the variable needs to be reassured. Looking at the easily accessible data set from the Fraser Institute, EFW Area 2<sup>10</sup>, which uses very similar measures as the ICRGE-index one sees that there is a variance in the data. This variance is not just interspatial but also intertemporal.

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<sup>10</sup> “Economic freedom of the World”-data set. Area 2 is “Legal Structures and Security of Property Rights”.

### **1.3 Outline of the Essay**

The remainder of the essay is organized in the following way. In the second chapter I evaluate the reasons to why institutions matters when it comes to economic growth, as to motivate the inclusion of institutional quality in the governance index. I also try to sort out the causal relationship between institutions and social capital to further strengthen the motivation to include institutions and not social capital in the governance index.

I now have my tool to evaluate the conditional effectiveness of aid, so the third chapter explains the growth equation with the identifying assumptions I make and the estimation methods. A description of the data used follows. Thereafter, I test the data in order to find any outliers. The last section of the chapter gives a description of my robustness tests made in the regressions. The fourth chapter presents the regression results made from the variants of the growth equation. I first use the full data set in my regressions and then omit the middle income countries, following the procedures in the APG-article.

Finally the last chapter, chapter five, contains concluding remarks.

## 2 The Importance of Institutions for Growth

The first chapter was designed to give a brief introduction to the subject of this essay and to evaluate the academic debate around the topic of good policies, institutions and aid effectiveness. In this chapter, I dig deeper into the underlying cause to why institutions and good governance matter in the first place. I introduce in this essay the notion of social capital since it is evaluated as a determinant of aid effectiveness by Baliamoune-Lutz & Mavrotas. Social capital is defined as *norms about reciprocity and generalized trust in other people*, following the definition used in Rothstein and Teorell (2005). This definition is user friendly since it encompasses many various measures and instruments used to measure social capital in the literature.

In this chapter I seek to clarify the interconnectedness between institutions and social capital and come to the conclusion that, even though there is a two-way lane, the probable linkage is that it is institutions that affect social capital and not the other way around. The purpose of this chapter is to give an understanding of the importance of institutions by introducing the major articles on the subject, which has shaped the academic debate up to this point. The chapter could also be read as an extended motivation for the inclusion of institutional quality in the governance index.

### 2.1 Institutions and Growth

When it comes to the importance of institutions on economic growth, there has been a lot of research on the topic. From being just one variable in the growth equation, the academic debate on institutions has now shifted the balance of power in favor of regarding institutions as one of the key determinants of sustained economic growth. The overall conclusion from the majority of the research in the field is that institutions matters. There are however many opinions to which extent those institutions matters and many methodological problems exists due to endogeneity problems. It has therefore been necessary to develop instrumental variables to use as proxies for institutions.

In a study by Rodrik et al. (2004), the authors estimate and compare the importance of three variables that has often been figuring the debate concerning economic growth. These are institutions, geography and trade and their samples are 79 and 137 countries. Geography, that is the only exogenous variable in their study, is measured as the distance from the equator. It is a key determinant to climate and the endowments of natural resources and exerts influence on agriculture and mortality. Hence, it is argued, have geography an influence on income levels. Institutions are viewed as endogenous determinants of growth. Therefore they are instrumented in the smaller sample as settler mortality, using the data set provided by Acemoglu et al (2001), and in the larger sample as the fraction of population speaking English or another Western European language (Hall and Jones, 1999). When measuring trade relations, one approach used by Frankel and Romer (1999) is to look at the trade/GDP ratio. Since it is also an endogenous variable, trade is instrumented by a predicted aggregated trade share on the basis of distance between trade partners, country mass etc.

Rodrik et al. find that the quality of institutions trumps both geography and trade as determinant of growth. Once institutions are controlled for, the effect of geography have at best a weak effect and the effect of trade is almost always insignificant and sometimes negative. The results are robust to changes in sample size and geographical dummies. A later study by Levchenko (2004) confirm the

findings of Rodrik et al. in the way that Levchenko finds that a country with low institutional quality may not gain from trade at all, and that factor prices may actually diverge as a result from trade.

There are many other important and famous articles on the subject. To summarize them all is far beyond the scope and subject of this chapter, but the last one worth mentioning in this context is *“Institutions and Economic Performance: Cross Country Tests Using Alternative Institutional Measures”* by Knack & Keefer (1995). This article is important in many ways since it compares many various measures of institutional quality and among those their own measure also used in the Burnside & Dollar article, ICRGE. They find that the impact of property rights on investments and economic growth are found to be greater when using their measure, ICRGE, than any of the other measures. Another finding is that when institutions are controlled for evidence of conditional convergence emerges. In a later article in 1997 the authors confirm the importance of institutions as determinants of convergence between rich and poor countries.

## **2.2 The Cob-Web Phenomenon of Institutions and Social Capital**

In chapter 1 I argued that there is a strong connection between institutions and social capital, something that was evident in the very definition of institutions proposed by North (1991). So far in this chapter I have summed up critical aspects of the debate and academic research about the important effect that institution exercise on growth. Another aspect, that is the focus in this section, concerns the causality between institutions and social capital. It is important to motivate the exclusion or inclusion of social capital into the growth equation.

One such motivation can be found in *“Aid Effectiveness: Looking at the Aid - Social Capital - Growth Nexus”* by Balamoune-Lutz and Mavrotas (2009). They motivate the inclusion of social capital in the growth equation, originally constructed by Burnside & Dollar (2000), by arguing that it is mainly social capital that influences the quality of institutions and not the other way around. They draw support for this view from among other studies, a study by Balamoune-Lutz (2009) in which the author found that improvements in measures of corruption can both strengthen and weaken the effects of institutions in promoting literacy, depending on the initial level of corruption. With low levels of initial corruption, which is an indicator of higher levels of social capital, the effects of institutions are increased. The second proxy for social capital is ethnic tension and that regression gives similar results, namely that lower ethnic tension improves the effectiveness of institutions.

Some rather more inconclusive results that concern the causality between institutions and social capital can be interpreted from articles by Knack & Keefer (2002) and Easterly et al. (2006). Knack & Keefer (2002) argues that social polarization, which can be viewed as a proxy for social capital, reduces the security of property and contract rights which in turn cause reduction in growth. On the other hand, policies and institutional changes that will reduce the social polarization are likely to increase growth. Easterly et al. (2006) initially states that social cohesion, which they measure as income inequality and ethnic fractionalization, endogenously determine institutional quality. They argue that low social cohesion can function as social constraints to pro-growth reforms via its impact on institutions. Hence, social cohesion is essential for generating reformation and change. But at the same time, Easterly et al. say that institutions itself are an important building block in the creation of a strong social cohesion.

Even though there is a clear connection between social capital and formal institutions, when arguing that the relationship mainly runs from social capital to institutions there seems to be a need to safe-guard the theoretical argumentation with a possibility that the relationship may go in the opposite direction. I believe that it is therefore important to investigate the arguments for this type of causal relationship.

Knack & Keefer (1997, a) find in their research that trust and civic cooperation are stronger in countries with strong formal institutions. Another finding is that interpersonal trust seems to be more important in the economic life when formal substitutes, i.e. strong institutions, are unavailable. From this result they draw the conclusion that strong institutions are a source that generates trust and civic norms, and therefore are reforms in the institutional design is more important where the level of trust is low.

This view is heavily supported by Bo Rothstein and Jan Teorell who argues that social capital is likely to be determined by the quality of government institutions, rather than the other way around (2005). They argue that it is the public institutions universality and impartiality that is the key for the creation of social capital in a society. Rothstein (2003:189) argues that it is the accumulated experiences people receive from meetings with government officials that help shape their belief of other people in the society. If they can't trust the government that is there to serve the public, then who can they trust? This evolution of distrust is accelerated if corruption is evident in the government. The conclusion might be that it is hard to operate in the society without starting with bribes and a corruptive behavior themselves, even if they find it morally repelling. Thus, further accelerate the distrust of others since they no longer find themselves to be trustworthy. Hence, Rothstein argues, it is imperative with strong and impartial government institutions. Rothsteins argumentation is supported by the conclusion that Clague (1993:248) draws:

*"... efficient bureaucracies provide incentives for rule obedience and that rule-obedient behavior molds attitudes favorable to rule obedience".*

The view that Knack & Keefer and Rothstein & Teorell presents concerning the causal relationship between social capital and institutions is supported from game theory experiments. Without institutions that restrict the possibility of gains from cheating and defection, there is nothing that hinders the players from rational, egoistic behavior with short term gains and long term losses leading to a low-level equilibrium of social capital. Pénard (2005) argues that institutions have a vital role in the interaction between the players in a game-theoretical setting. They function as commitment devices providing means to establish a credible commitment between players; they function as information-enhancing devices reducing uncertainty and transaction costs and therefore institutions can be viewed upon as cooperation-enhancing institutions.

I have in this chapter explained the importance of institutions on economic growth, and on the interconnectedness between institutions and social capital. Even though it is hard to establish the exact causal relationship between social capital and institutions I have presented research that has strong theoretical and empirical arguments to why, primarily, institutions affect social capital and not the other way around. However, no matter what the true causal relationship between institutions and social capital is, it should now be clear that they are closely related to each other.

### 3 Empirical Model and Data Sources

This chapter is designed to define the estimated model and to present the data sources used in this essay. My goals with this essay is to answer whether the effects of aid on growth is conditional on good governance and if that connection is stronger than that of the growth effects of aid conditional on economic policies, which results are presented by Burnside & Dollar (2000). Furthermore, in doing so I also examines whether the results are sensitive to endogeneity in the key explanatory variables.

Therefore, first of all, I will present my growth equation and the exclusion restrictions with which the models achieve identification. Secondly, I describe the data sources used in this essay. Since the data contains outliers which affect the regression results I present a simple method to find these outliers. Finally, there is a short presentation of the robustness test used in this essay.

#### 3.1 The Growth Equation

Since the method used in this essay, with the exception of the changes made in some variables, is exactly the same as the method in Burnside & Dollars (2000) I use roughly the same growth equation. The difference lies in the new governance index, and a replaced variable for institutional quality that I use in the growth regression, which yields the following main growth equation:

$$g_{it} = y_{it}\beta_y + a_{it}\beta_a + g_{it}\theta_p + a_{it}g_{it}\theta_1 + \mathbf{z}'_{it}\beta_z + g_t + \varepsilon_{it}^g \quad (\text{Growth equation}) \quad (3)$$

In the above equation,  $i$  indexes countries,  $t$  indexes time,  $g$  is per capita real GDP growth,  $y$  is the log of initial real per capita GDP,  $a$  is aid receipts relative to GDP,  $g$  is the governance index,  $\mathbf{z}$  is a  $K \times 1$  vector of other exogenous variables that might affect growth,  $g$  are fixed time effects, and  $\varepsilon^g$  are the error term. The motivation to include time effects is to capture the impact of worldwide business cycles.

The way that the aid and governance variables enter the equation can be derived from a neoclassical growth model<sup>11</sup>. This shows that not only can aid affect growth by itself, but if aid effectiveness somehow was affected by the level of good governance in the recipient country then the effects of aid may be enhanced. I am however not only interested in the importance of good governance but also to compare good governance to a modified version of the original policy index constructed by Burnside & Dollar<sup>12</sup> and to that of institutional quality alone. The difference with my policy index and the one that Burnside & Dollar use is that I change the variable for institutional quality. To summarize, variations of equation (3) is used where I first replace the governance index with the modified policy index and in a third regression replace the governance index with the measure of institutional quality. I estimate all my equations with simple ordinary least squares (OLS) and with two stage least squares (2SLS). I use the 2SLS procedure to account for potential endogeneity problems in the aid, institutional quality, policy, and governance variables.

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<sup>11</sup> This is done in the appendix to Burnside & Dollar (2000).

<sup>12</sup> The difference is a change in the variable for institutional quality so it changes over time, and added additional instruments to account for endogeneity problems within the growth equation.

Institutional quality is in the literature mentioned in the previous chapters considered to be endogenous to income and growth and should be tested as such in this data set. Burnside & Dollar treat institutions as exogenous since they only use the figures for the year 1980 in their regressions but since my variable for institutions changes over time it is important to check if the variable should be treated as exogenous or endogenous to growth in the data set. Policies could be considered endogenous since they are affected by the economic climate at time. Therefore, since I search for endogeneity in both my policy and institutional quality variables, I find it motivated to test my governance variable for possible endogeneity problems with the growth equation.

The method used to create exogenous instruments to the governance, policy and institutional quality variables, to account for potential endogeneity problems in the model, is by lagging the three variables. In this way the instruments are determined prior to the current period and the error term are thus unrelated to the instruments. This is a simple way to achieve exogenous instruments to use in the 2SLS regressions but they are not strictly exogenous and there occurs a loss of the first observation in each time series. In this case there is a loss of 56 observations, one for each country represented in the data series. So in the 2SLS regressions there are only 219 and 149 observations for the full and low-income country data set with outliers included, in comparison to 275 and 189 observations in the OLS regressions.

To capture convergence effects I allow growth during period  $t$  to depend on  $y$ , as is standard in the growth literature. Aid is included in the growth equation since it is of primary interest in this essay to assess the importance of foreign aid on growth. The  $K \times 1$  vector of exogenous variables is assumed not to be affected by shocks to growth or the level of aid and consists of variables capturing various institutional and political factors that might affect growth. These variables are described below in 3.3.

The governance index is constructed as a weighted average of the three measures of policies used by Burnside & Dollar (2000)<sup>13</sup> and a measure of institutional quality obtained from the Economic Freedom of the World 2008 data set<sup>14</sup>, using the values of Area 2<sup>15</sup> as a measure of institutional quality. It is weighted as the individual variables affect on growth using equation (3) to find the weights, excluding the aid variables and using the individual governance variables. The equation for the governance index is:

$$\text{Governance} = \beta_1 + \beta_2 \times \text{Budget surplus} + \beta_3 \times \text{Inflation} + \beta_4 \times \text{Openness} + \beta_5 \times \text{Institutional quality}.$$

The constant is scaled so that the index has the same mean as the GDP growth in either the full sample or low-income country sample. This procedure allows for a discussion of aid effectiveness in a good or bad governance environment. The index is measured in percentage points of GDP growth and by adding the constant  $\beta_1$  the index can be interpreted as the countries predicted growth rate, assuming that all other variables in that regression, except the governance measures, are given its mean values.

To assess the effects of the change in the variable for institutional quality (IQ) I have made one growth regression for each measure of institutional quality using the growth equation, excluding the

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<sup>13</sup> Sach's and Warner's trade openness variable (1995), Fischer's monetary policy variable (1993) and Easterly and Robelo's variable for fiscal policy (1993).

<sup>14</sup> The data set can be obtained from the Fraser Institute.

<sup>15</sup> Area 2 consists of various data measuring the Legal Structure and the Security of Property Rights.

aid variables and using the individual governance variables. In Table 1 the full data set is used and in Table 2 the middle income countries are excluded<sup>16</sup>.

	EFW		ICRGE	
	Coefficient	t-Stat	Coefficient	t-Stat
Log of Initial GDP	-0,50	-0,87	-0,65	-1,15
Ethnic fractionalization	-0,69	-0,92	-0,58	-0,77
Assassinations	-0,38	-1,19	-0,44	-1,59
Ethnic * Assas	0,70	1,34	0,81*	1,72
Institutional quality	0,43***	2,88	0,64***	3,62
M2/GDP (lagged)	0,01	0,99	0,01	0,97
Sub-Saharan Africa	-1,39*	-1,76	-1,53**	-2,04
East Asia	0,76	1,19	0,89	1,54
Budget Surplus	6,61*	1,87	6,85*	1,96
Inflation	-1,56***	-3,96	-1,40***	-3,28
Openness	2,27***	4,08	2,16***	4,12
R2 adj.	0,35		0,35	
Observations	275		275	

**Notes:** \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\*Significant at the 1% level, The dependent variable is real per capita GDP growth,

	EFW		ICRGE	
	Coefficient	t-Stat	Coefficient	t-Stat
Log of Initial GDP	-0,46	-0,62	-0,67	-0,90
Ethnic fractionalization	-0,88	-1,01	-0,75	-0,85
Assassinations	-0,98**	-2,02	-0,76	-1,62
Ethnic * Assas	1,37	1,46	0,98	1,06
Institutional quality	0,48***	2,80	0,77***	3,78
M2/GDP (lagged)	0,03**	2,01	0,03	1,64
Sub-Saharan Africa	-1,72**	-2,60	-1,89***	-2,90
East Asia	0,40	0,57	0,72	1,13
Budget Surplus	8,30**	2,38	7,28**	2,10
Inflation	-1,78***	-2,82	-1,66***	-2,61
Openness	2,61***	3,84	2,46***	3,81
R2 adj.	0,39		0,41	
Observations	189		189	

**Notes:** \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\*Significant at the 1% level, The dependent variable is real per capita GDP growth,

One can see that the significance of the different results stays the same. There are very similar parameter estimates in the main variables; institutional quality, budget surplus, inflation and openness. The interesting difference in the regression results between the two measures of institutional quality in the growth regressions are that inflation and openness seems to be more important with the new measure of institutional quality. That is also the case with fiscal balance in the low-income country sample, indicating that the importance of Burnside & Dollars policy index on growth is greater when institutional quality are changing over time. Institutional quality itself has a lower parameter value with the new measure, EFW.

### 3.2 Summary of Estimation and Identification

Table 3 presents a full summary of the variables used in the growth regressions. Economic growth, institutional quality, the policy index, the governance index, and aid are treated as endogenous variables. I estimate variants of equation (1) both without an interaction term and with an additional interaction term between aid squared and the governance index. I use a vector of variables in the growth regression that is considered to be exogenous. To achieve identification in the 2SLS regressions and to attempt to explain the aid interaction terms in the first stage regression I also add five other exogenous variables that is constructed by interact the lagged governance, policy and institutional quality variables with selected exogenous variables.

I refer to Table 3 for a summary of the variables included in the regressions, and the exclusion restriction with which the model achieve identification. Actually, my 2SLS estimator has 14 excluded exogenous variables and is therefore over-identified. Compared to the APG-article by Burnside &

<sup>16</sup> The middle income countries are arbitrarily defined as countries with an initial real GDP/capita above 1900 USD at the beginning of the sample period, 1970. The Appendix includes a full list of countries in the samples.

Dollar (2000), three additional instruments are added to support institutional quality in the 2SLS regressions and the lagged data series of the key explanatory variables are also used as instruments. It is important to note that I use all exogenous variables as instruments in the 2SLS regressions with the exception that I replace the IQ and policy variables with the governance variable and the other way around.

<b>Table 3 - Summary of regression specifications and identification</b>			
<b>Variable</b>	<b>Variants of the growth equation</b>		
<u>Endogenous variables</u>			
Real growth rate	LHS	LHS	LHS
IQ/Policy index/Governance index	RHS	RHS	RHS
Aid/GDP	RHS	RHS	RHS
(Aid/GDP) * IQ/Policy/Governance		RHS	RHS
(Aid/GDP) <sup>2</sup> * IQ/Policy/Governance			RHS
<u>Exogenous variables</u>			
IQ/Policy index/Governance index. Lagged (_1)			
Log of initial income	Included	Included	Included
Ethnic fractionalization	Included	Included	Included
Assassinations	Included	Included	Included
Ethnic frac*Assas	Included	Included	Included
M2/GDP. Lagged	Included	Included	Included
Log of population			
Arms imports/imports. Lagged			
Sub-Saharan Africa dummy	Included	Included	Included
East Asia dummy	Included	Included	Included
Egypt dummy			
Franc zone dummy			
Central America dummy			
Fraction of population speaking English			
Fraction of population speaking a major European language			
Geography			
Log of initial income*IQ_1/Policy_1/Governance_1			
(Log of initial income) <sup>2</sup> *IQ_1/Policy_1/Governance_1			
Arms imports/imports. lagged*IQ_1/Policy_1/Governance_1			
Log of population*IQ_1/Policy_1/Governance_1			
(Log of population) <sup>2</sup> *IQ_1/Policy_1/Governance_1			
<b>Notes:</b> LHS = Left hand side of the equation; RHS = Right hand side of the equation; All exogenous variables are used as instruments in 2SLS estimation, except in estimations with the lagged governance variable where I exclude the lagged IQ and policy variables and the other way around.			

### 3.3 Data Sources

As mentioned in the introductory chapter, I have used the same data set as Burnside & Dollar (2000), with the exception of the institutional quality variable which I get from the Economic Freedom of the World data set, area 2. The Burnside & Dollar data contains the variables presented in Table 3, with the exception of the language and geography instruments. The data is available for all variables in 56 countries amounting to 275 observations. Most of the countries in the data set are sub-Saharan African or Latin American, with 21 countries each in the full data set. The Appendix presents the full list of countries.

Following the Burnside & Dollar method, I also use a restricted data set including only low income countries since it can be argued that the middle income countries usually have good access to the world capital markets. This is done because there is reason to believe that the easier it is for a country to use the foreign capital markets, the less effective aid becomes. Another way to put it is that the expected marginal return on aid, as an injection of capital, in a capital scarce environment is higher than in an environment with relatively easy access to capital. Using the same definition as Burnside & Dollar (2000), the middle income countries are defined as countries with an initial real GDP/capita above 1900 USD at the beginning of the sample period, 1970. 12 of the 21 Latin American countries are here considered to be middle income countries, leaving the low income country data set consist of mainly sub-Saharan African countries. Eliminating the middle income countries leaves a data set with 40 countries and 189 observations. As mentioned in 3.1, the 2SLS regressions have 219 observations in the full data set and 149 observations in the low-income countries data set. Table 4 provides summary statistics for selected key variables.

<b>Table 4 - Summary statistics</b>					
	GDP/C 1970 in 1985 USD	GDP/C growth (% per year)	Aid (% of GDP)	Governance index	Policy index
<b>Full sample</b>					
Mean	2344	1.2	1.6	1.2	1.2
Median	1824	1.2	0.8	0.9	0.9
Standard deviation	1791	3.6	2.1	1.6	1.3
<b>Low-income countries</b>					
Mean	1469	1.1	2.1	1.1	1.1
Median	1297	1.2	1.3	0.9	0.8
Standard deviation	796	3.6	2.3	1.9	1.6
<b>Notes:</b> The full sample consists of 56 countries and 275 observations while the low-income countries case is based on 40 countries and 189 observations. The indices are scaled to have the same mean as per capita GDP growth in the sample used.					

Two interesting facts can be noted here. First of all, low-income countries have a lower rate of per capita GDP growth than the full sample and receive more aid as a share of their GDP. Secondly, the governance index has a much higher variance than the policy index. The reason for this is the institutional quality variable, which is omitted in the policy index.

In order to be able to treat institutions as endogenous in the 2SLS regressions three instruments are added to the Burnside & Dollar data set. These instruments, language and geography, are

obtained from the data set constructed by Hall & Jones (1999). They are considered to be good instruments since they are positively correlated with social infrastructure such as property rights and legal systems. There are two language instruments. The first is the fraction of the population speaking English as a mother tongue and the second is the fraction of the population speaking a major European language<sup>17</sup> (including English). The extent to which a European language is spoken as a mother tongue is logically correlated to the extent of European influence. The geography instrument is a measure of the distance from the equator. The idea is that European settlers were more likely to migrate to and settle regions of the world that were more sparsely populated and similar in climate to their home countries.

The exogenous variable ethnolinguistic fractionalization originates from old Soviet data and measures the probability that two randomly selected individuals in a country will belong to different ethnolinguistic groups. The variable will increase with the number of ethnolinguistic groups in the selected country and the more equal the size of the groups are. Ethnolinguistic fractionalization is found to correlate with bad policies and low growth, so it is included to try to capture long term effects that social capital and institutions could have on growth.

The assassinations variable is included trying to capture social unrest and the lagged variable of broad money supply over GDP is included as a proxy for the development of the financial system.

The aid variable comes from the World Bank database developed by Chang et al. (1998) but is converted to constant 1985 US dollars, divided by real GDP in constant 1985 prices. The four variables for the governance index (trade openness, inflation, budget surplus and institutional quality) are all available from the Burnside & Dollar data set and the EFW data set, area 2. The trade openness variable was developed by Sachs and Warner (1995). A closed economy is defined as having average tariffs on machinery and materials above 40%, or a black market premium above 20% or pervasive government control over key tradables (Burnside & Dollar, 2000). This essay uses two measures of institutional quality. The first of them is the same as the one used in APG (2000) and the other one are a measure of institutional quality from the EFW data set.

One of the first things to remember regarding institutional quality is that the input data is survey information that capture investors' perceptions rather than the actual reality. These subjective perceptions can be biased depending on the economic climate in the country in question, the so called Halo-effect (Aron, 2000; Burnside & Dollar, 2004). The second thing to note is not to downsize the complexity of institutions to a form of "Rule of Law-reductionism" (Rodrik, 2004). It can be argued that it was this sort of phenomenon that occurred during the era of the so called Washington Consensus (Rodrik, 2006; Williamson, 2002) when the focus was on getting the policies right. The resulting policy advices followed text book examples but was not contextually based which resulted in very different, and sometimes negative, output.

Another critical point worth mentioning is that even though this essay as well as the majority of the institutional economics literature in the subject as a whole highlights the importance of good governance and institutions, the result from the research does not tell us the actual policy- and institutional design that is responsible for high quality institutions.

The first measure of institutional quality was developed by Knack & Keefer (1995). It captures the security of property rights and efficiency of the government bureaucracy. The data comes from two private international investment risk services, International Country Risk Guide (ICRG) and Business Environmental Risk Intelligence (BERI). The measures used from ICRG are "*Expropriation Risk*", "*Rule*

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<sup>17</sup> The included languages are: English, French, German, Portuguese and Spanish.

of Law”, “Repudiation of Contracts by Government”, “Corruption in Government” and “Quality of Bureaucracy”. Most of the observations from the ICRG measure are from 1980 and onwards. The measures from BERI are “Contract Enforcability”, “Infrastructure Quality”, “Nationalization Potential” and “Bureaucratic Delays”. From BERI, the observations are from 1972 and onwards. However, Burnside & Dollar uses each country figure for 1980 throughout, based on the assumption that institutional quality changes slowly over time.

The second measure from the EFW data set from the Fraser Institute uses data of Institutional quality which is also from the ICRG and the BERI indices. From ICRG they use the measures “Expropriation Risk” and “Rule of Law” equally with a 50% weight<sup>18</sup>. From BERI they use various sub-components similar to those of the ICRG measure<sup>19</sup>. As mentioned in the first chapter, both these information services are based on subjective survey information. But they act as proxies for the measurement of the transaction and transformation costs of production that may affect the volume and efficiency of investment and hence growth (Aron, 2000).

Worth mentioning here is the relatively close similarity between the two different measures of institutional quality, but the important difference is that the measure from EFW is changing over time. I choose the EFW measure since institutional quality, especially in developing countries, can change over time. Aron (2000) argues that institutional quality periodically can deteriorate sharply as a result of political, social, economical or even environmental changes or shocks (like terms-of-trade, social/political instability, fiscal austerity programs etc.). This is especially true for developing countries.

Unfortunately, the EFW data set misses 58 observations to be able to fully complement the Burnside & Dollar data in the full data set. Among these missing figures, there are three countries for which data are unavailable in the EFW data set. These are Ethiopia, Gambia and Somalia comprising of a total of 10 missing observations. However, because of the close similarity between the two measures I choose to simply use the Burnside & Dollar value (which is the value of institutional quality in 1980) for these three countries. For the other 48 missing values the missing figures are all in the 1970s. Therefore, my method here has been to use the values of the time period closest to the missing observations. Adding these similar observations to the EFW data set completes the data set giving it 275 observations.

### 3.3.1 Testing for Outliers

Regression results can sometimes be heavily influenced by so-called outliers, which are data points that take extreme values in comparison to other observations in the data set<sup>20</sup>. Burnside & Dollar (2000) find in their data five big outliers (Gambia 1986-89, 90-93; Guyana 90-93 and Nicaragua 86-89, 90-93) that heavily affects the regression results. The method they use to obtain the outliers is very

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<sup>18</sup> Economic Freedom of the World: 2001 annual report.

<sup>19</sup> The information of which sub-components used in the EFW-reports comes from Robert Lawson. Despite investigating which sub-components used from BERI I was unable to retrieve that information.

<sup>20</sup> In such cases the outliers are often worthy of extra attention to figure out if the reasons for the abnormal data falls inside or outside the model specification.

burdened with calculations, so I set out to find the outliers in my data sets with an easier, graphical approach used among others by Evans and Rauch (1999)<sup>21</sup>.

The method is as follows. Regress the growth equation without the variable that is being checked for outliers, save the residuals from that regression and plot them against the variable of importance. The residuals are the unexplained growth in the regression results. Figure 1 reveals that there are five major outliers affecting the interaction between aid and the policy index, three positive and two negative outliers. This result confirms that this method produces very similar output in the given data since the outliers are the same as those found by Burnside & Dollar.

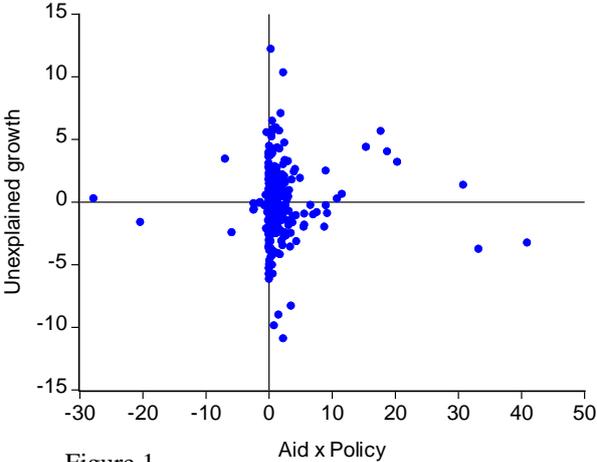


Figure 1

Figure 2 shows the graphical test for outliers when I replace the Aid\*Policy variable with the Aid\*Governance variable. The governance index is calculated using the EFW-area 2 data. This plot only reveals four big outliers, two negative and two positive. With the exception of the observation Guyana (1990-1993), the outliers are the same as in Figure 1.

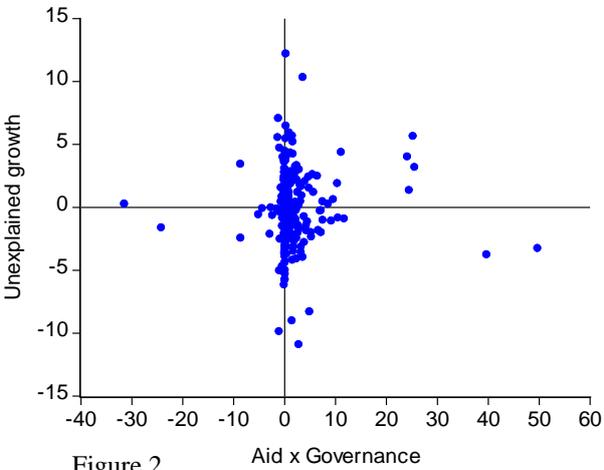


Figure 2

<sup>21</sup> The difference is that Evans and Rauch do not use the method to find outliers but just graphically plot their variables. But the method remains the same and the visual examination to find outliers is still valid.

### 3.4 Robustness Checks

As I in the next chapter present the results from both OLS and 2SLS regressions there is a need to make sure that I examined possible endogeneity problems in my regressions. If endogeneity problems appear to affect parameter estimates, a 2SLS estimation procedure is preferable. However, without such affect on the estimates then the OLS estimation results are preferable since they then retain their BLUE properties<sup>22</sup>.

An easy way of testing for endogeneity was presented by Hausman in 1978. Suppose that we under the null hypothesis have two consistent estimators of  $\beta$ ,  $b_{LS}$  and  $b_{IV}$ , which symbolize the estimates of  $\beta$  from OLS and 2SLS (instrumental variable, IV) regressions. Under the alternative hypothesis only  $b_{IV}$  is consistent. Hausmans suggestion is to examine:  $d = b_{IV} - b_{LS}$ .  $d$  is under the null hypothesis statistically indifferent from zero, or:  $\text{plim } d = 0$ . Thus, the higher probability value calculated from the test the higher probability for the variable to be exogenous (Greene, 2003).

From my list of right hand side variables in Table 3 I identified three variables potentially endogenous. These are institutional quality, policies and aid. As the results below indicate, the data seems to support the view that I can treat the mentioned variables, with the exception of institutional quality in the low-income country case, as exogenous to the sample.

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<sup>22</sup> BLUE stands for Best Linear Unbiased Estimator.

## 4 Growth Regressions

This chapter presents the results from the growth regressions. The outline of the chapter is as follows. First of all, I have tested whether or not aid has an impact on growth, without aid interacting with the governance, or policy index. This is done to compare the results from the data used in this essay with previous research on aid effectiveness described in chapter 1.

Subchapter 4.1 presents the regression results from the full sample data set and in 4.2 I exclude the middle income countries. To increase the transparency of the results in subchapters 4.1 and 4.2, I present the regression results in these sections both when including and excluding outliers so that the reader can draw their own conclusion about the sensitivity of the results and the inferences drawn. The adjusted coefficient of determination,  $adj. R^2$ , is pending around 0.4 in most of the regressions indicating that the econometric growth model has a relatively good explanatory power. In addition to the interaction variable,  $aid * governance/policy/IQ$ , a quadratic interaction variable is also included in the regressions to see if there is any diminishing returns to the interaction variable. However, the favored model specification is the one without the quadratic interaction variable and the outliers excluded. The reason is that the quadratic interaction term depends on the outliers so when the outliers are excluded the quadratic interaction term becomes insignificant. These results are consistent with Burnside & Dollars results (2000).

In table 5, below, I have tested the unconditional effectiveness of aid. The results reveal that aid has no significant effect on the economic growth rate. In both regressions with the governance index and with the policy index, the Hausman test of exogeneity of the aid, policy, IQ and governance variables gives us highly insignificant p-values. We can therefore put some faith into our OLS results. However, in this case this is of little importance since both the OLS and the 2SLS regression results tells us that aid has an insignificant impact on growth. The variables that indeed have a big influence on growth are institutional quality and the policy- and governance indices. I also test further regressions including a variable where aid is squared, to see if there are any diminishing returns to aid. However, in those regressions both aid variables become even more insignificant with lower values of the aid coefficients. These results are presented in Table A2 in the appendix.

	Policy index				Governance index			
	OLS	t-Stat	2SLS	t-Stat	OLS	t-Stat	2SLS	t-Stat
Log of Initial GDP	-0,42	-0,69	-0,80	-1,00	-0,42	-0,76	-0,91	-1,27
Ethnic fractionalization	-0,61	-0,82	-0,43	-0,47	-0,61	-0,83	-0,46	-0,52
Assassinations	-0,41	-1,35	-0,34	-1,01	-0,42	-1,41	-0,32	-1,00
Ethnic * Assas	0,78	1,54	0,64	1,23	0,79	1,59	0,60	1,19
Sub-Saharan Africa	-1,52*	-1,93	-1,63	-1,58	-1,51**	-2,20	-1,60*	-1,86
East Asia	0,73	1,14	0,52	0,66	0,73	1,13	0,52	0,62
M2/GDP (lagged)	0,01	0,89	0,01	0,88	0,01	0,98	0,02	1,20
IQ - EFW	0,44***	2,91	0,47**	2,07				
Policy index	1,00***	6,26	1,19***	5,08				
Governance index					1,00***	6,89	1,14***	4,67
Aid/GDP	0,12	0,75	-0,05	-0,17	0,12	0,91	-0,10	-0,42
Test for exogeneity of the aid variables								
Chi-square, P-value	0,99				0,55			
Test for exogeneity of the IQ-EFW, the policy index and the governance index								
Chi-square, P-value	IQ-EFW		Policy index		Governance index			
	0,57		0,52		0,45			
R2 adj.	0,34		0,33		0,34		0,34	
Observations	270		214		271		215	
<b>Notes:</b> * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level, The dependent variable is real per capita GDP growth.								

## 4.1 Growth Regressions with the Complete Data set

To get at clear understanding of whether or not the governance index generates higher and/or stronger results than the policy index I redo the growth regressions done in Burnside & Dollar (2000), with the new variable for institutional quality, and use these results as a benchmark. I also do another set of regressions which is the same as the ones above but with institutional quality interacting with aid.

	Policy Index				Institutional quality			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Outliers		No Outliers		Outliers		No Outliers	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Log of Initial GDP	-0.45 (-0.73)	-0.76 (-0.98)	-0.49 (-0.79)	-0.93 (-1.13)	-0.37 (-0.60)	-0.84 (-1.01)	-0.43 (-0.70)	-0.81 (-0.97)
Ethnic fractionalization	-0.61 (-0.81)	-0.01 (-0.01)	-0.60 (-0.80)	-0.45 (-0.49)	-0.54 (-0.71)	-0.48 (-0.43)	-0.70 (-0.93)	-0.49 (-0.52)
Assassinations	-0.41 (-1.32)	-0.36 (-1.00)	-0.40 (-1.27)	-0.34 (-0.98)	-0.43 (-1.50)	-0.30 (-0.89)	-0.46 (-1.59)	-0.33 (-0.97)
Ethnic * Assas	0.72 (1.40)	0.64 (1.13)	0.70 (1.36)	0.57 (1.05)	0.78 (1.62)	0.49 (0.94)	0.79 (1.63)	0.58 (1.12)
Sub-Saharan Africa	-1.58** (-2.05)	-2.15** (-2.10)	-1.58** (-2.00)	-1.59 (-1.51)	-1.73** (-2.21)	-1.83 (-1.50)	-1.61** (-2.09)	-1.74* (-1.84)
East Asia	1.10 (1.65)	0.86 (0.98)	1.10 (1.65)	1.00 (1.20)	0.92 (1.46)	1.03 (1.18)	0.97 (1.51)	0.74 (0.82)
M2/GDP (lagged)	0.02 (1.25)	0.04* (1.74)	0.02 (1.12)	0.02 (1.30)	0.01 (0.52)	0.02 (1.06)	0.01 (0.55)	0.01 (0.88)
IQ - EFW	0.44*** (2.90)	0.54** (2.19)	0.44*** (2.93)	0.45** (2.00)	0.40** (2.31)	0.39 (1.20)	0.35** (2.00)	0.42 (1.28)
Policy index	0.78*** (3.92)	0.83** (2.50)	0.74*** (3.81)	0.84*** (2.92)	0.95*** (7.09)	0.90*** (3.74)	0.90*** (6.13)	1.08*** (4.20)
Aid/GDP	0.005 (0.04)	0.01 (0.05)	-0.04 (-0.24)	-0.36 (-1.09)	0.0002 (0.0007)	-0.35 (-0.59)	-0.19 (-0.45)	-0.27 (-0.36)
Aid/GDP*Policy,IQ-EFW	0.18** (1.86)	0.65* (1.86)	0.16** (2.27)	0.30** (2.20)	0.08 (0.81)	0.10 (0.51)	0.07 (0.85)	0.05 (0.35)
(Aid/GDP)2*Policy,IQ-EFW	-0.02** (-1.95)	-0.08* (-1.83)			-0.008 (-1.48)	-0.01 (-0.28)		
Test for exogeneity of the aid variables								
Chi-square. P-value	0.49		0.88		0.46		0.91	
Test for exogeneity of the institutional quality variables and the policy index								
Chi-square. P-value	IQ-EFW	Policy	IQ-EFW	Policy	IQ-EFW	Policy	IQ-EFW	Policy
	0.45	0.78	0.69	0.85	0.54	0.29	0.54	0.26
R2 adj.	0.35	0.21	0.34	0.33	0.34	0.35	0.34	0.34
Observations	275	219	270	214	275	219	270	214

**Notes:** \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level. The dependent variable is real per capita GDP growth. The t-statistic are the figures in paranthesis.

Table 6, above, present the results from these regressions. In the regressions with the policy index, column 1-4, both the policy index and institutional quality are highly significant and so is the interaction between policy and aid in both the OLS and 2SLS regressions, albeit only with a 10% significance level in the 2SLS regression in column 2. These results are an improvement of those of Burnside & Dollar (2000) since now even the 2SLS confirms the importance of the policy index. However, in this case the explanatory power falls to the lowest level of all the regressions at 0.21. The result from the regressions when institutional quality interact with aid, column 5-8, are similar

when it comes to the individual effects from policy and institutional quality but now the interaction effect between institutional quality and aid is small and insignificant. So it seems like the policy index has a greater influence on growth than institutional quality when it interacts with aid.

When the outliers are excluded the aid\*policy interaction variable becomes more significant in the 2SLS regressions. This indicates that the outliers affect the regression results even though the OLS regressions are robust to sample changes. The exogeneity test shows that all the suspected endogenous variables can be treated as exogenous to the sample, with the lowest p-value at 0.26. In the regressions in columns 1-8, the policy index has a higher affect on growth both by itself and when it interacts with aid, compared to institutional quality. A final remark on the results from Table 6 is that the geographical variable for sub-Saharan Africa show strongly negative significant results. This result from the geographical dummy is repeated in the regressions below indicating that it has a strongly negative impact on growth if the country in question is located in sub-Saharan Africa.

Table 7, below, presents the regression results when the governance index is used instead of the policy index and institutional quality variable. With a chi-square probability value of 0.32, and 0.56 when excluding outliers, the aid variable can be viewed upon as exogenous to the sample. The governance variable can also be regarded as exogenous with the lowest p-value at 0.58. The results in Table 7 show the importance of good governance interacted with aid in all columns except column 12. This indicates that it is only the OLS regression results that are robust to outliers. Since the p-values are very high, in three out of four cases above 0.5, we can put a high degree of trust in the OLS results in both column 9 and 11.

These results reveal that a unit change in governance interacted with aid result in a 0.18, or 0.13 without outliers, percentage point's increase in GDP growth. In the regression without outliers the results are a bit lower, but they are on the other hand stronger with higher test statistics. This may say little at a first glance, but considering that the mean growth rate in the full data set was only 1.2 this means that the impact of aid allocated to countries with better governance could be quite high. A quick comparison between columns 1 and 3 to 9 and 11 show us a very high degree of similarity in the results, as should be since the two indices are very similar. This could mean that using institutional quality as a component of the index does little to affect its influence on growth in the full sample, or even reduce the impact of the policy index on growth. If this means that the middle income countries in the full sample reduces the importance of institutions when it comes to aid effectiveness, or if institutions does not strengthen the overall results remains to be seen in subchapter 4.2. Apart from these results, the only other significant variable is the dummy for sub-Saharan Africa.

<b>Table 7 - Growth Regressions: Using all countries and the Governance Index</b>								
	(9)		(10)		(11)		(12)	
	Outliers				No Outliers			
	OLS	t-Stat	2SLS	t-Stat	OLS	t-Stat	2SLS	t-Stat
Log of Initial GDP	-0,40	-0,74	-0,76	-1,10	-0,47	-0,85	-0,96	-1,31
Ethnic fractionalization	-0,64	-0,85	-0,13	-0,14	-0,73	-0,98	-0,59	-0,67
Assassinations	-0,42	-1,41	-0,35	-1,06	-0,44	-1,47	-0,32	-0,98
Ethnic * Assas	0,71	1,40	0,58	1,08	0,72	1,43	0,52	1,00
Sub-Saharan Africa	-1,62**	-2,35	-2,32***	-2,62	-1,50**	-2,19	-1,62*	-1,89
East Asia	1,13*	1,69	0,90	0,97	1,17*	1,74	0,94	1,06
M2/GDP (lagged)	0,02	1,22	0,03	1,55	0,01	1,05	0,02	1,30
Governance index	0,80***	4,71	0,86***	2,69	0,76***	4,86	0,91***	3,12
Aid/GDP	0,02	0,19	0,04	0,19	-0,06	-0,34	-0,29	-0,96
Aid/GDP*Gov, index	0,18**	2,15	0,55**	2,09	0,13**	2,27	0,15	1,22
(Aid/GDP)2*Gov, Index	-0,02**	-2,48	-0,07**	-2,15				
Test for exogeneity of the aid variables								
Chi-square, P-value	0,32				0,56			
Test for exogeneity of the governance index								
Chi-square, P-value	0,71				0,58			
R2 adj.	0,35		0,24		0,35		0,35	
Observations	275		219		271		215	
<b>Notes:</b> * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level, The dependent variable is real per capita GDP growth.								

## 4.2 Growth Regressions when Excluding Middle Income Countries

Under the premise that aid works better in a capital scarce environment, as mentioned in chapter 3.3.1, the method of testing my growth equation (1) in a low income country sample follows a sound logic. Furthermore, if the regression result indicates that aid interacted with governance is a highly significant factor for economic growth then this has bigger implications for low-income countries. As Table 4 shows, low income countries have a lower mean per capita GDP growth and a lower mean value of the governance index but receive a higher share of aid relative to their GDP than the full sample summary statistics. Following the same procedure as in 4.1, I first test whether or not the policy index or institutional quality interacted with aid has a significant impact on growth. This is done in Table 8 below. The reason for this is to facilitate comparisons between the governance and the policy indices. I then continue to present the results from regressions with the governance index and its interaction with aid in Table 9.

	Policy Index				Institutional quality			
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	Outliers		No Outliers		Outliers		No Outliers	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Log of Initial GDP	-0.47 (-0.54)	-1.28 (-1.59)	-0.65 (-0.73)	-1.76** (-2.33)	-0.54 (-0.61)	-1.49** (-2.04)	-0.69 (-0.78)	-1.72** (-2.11)
Ethnic fractionalization	-0.79 (-0.92)	-0.17 (-0.15)	-0.88 (-1.04)	-0.75 (-0.76)	-0.86 (-0.98)	-0.81 (-0.68)	-1.09 (-1.26)	-0.82 (-0.73)
Assassinations	-1.05** (-2.21)	-1.36*** (-2.87)	-1.04** (-2.17)	-1.05** (-2.27)	-1.00** (-2.03)	-0.84* (-1.56)	-0.96* (-1.82)	-0.93* (-1.87)
Ethnic * Assas	1.26 (1.29)	1.72 (1.61)	1.20 (1.23)	1.02 (1.00)	1.38 (1.41)	0.93 (0.91)	1.38 (1.38)	1.35 (1.45)
Sub-Saharan Africa	-1.89*** (-2.76)	-2.79*** (-2.93)	-1.93** (-2.81)	-2.54*** (-2.98)	-1.86*** (-2.68)	-2.55** (-2.29)	-1.79*** (-2.72)	-2.46*** (-2.99)
East Asia	0.93 (1.11)	0.72 (0.47)	1.05 (1.31)	1.25 (1.07)	0.53 (0.77)	0.69 (0.77)	0.44 (0.63)	-0.23 (-0.22)
M2/GDP (lagged)	0.04** (2.14)	0.06** (2.30)	0.03** (2.00)	0.04** (2.21)	0.03* (1.94)	0.04* (1.87)	0.03* (1.91)	0.04* (1.90)
IQ - EFW	0.49*** (2.77)	0.53* (1.83)	0.52*** (2.90)	0.66*** (2.73)	0.38 (1.61)	0.51 (1.29)	0.29 (1.22)	0.47 (0.98)
Policy index	0.69** (2.12)	1.03 (1.31)	0.56** (2.18)	0.60 (1.20)	1.01*** (6.15)	0.93*** (3.40)	0.96*** (5.60)	1.44*** (3.96)
Aid/GDP	-0.03 (-0.25)	0.17 (0.75)	-0.13 (-0.79)	-0.36 (-1.36)	-0.17 (-0.49)	-0.49 (-0.70)	-0.52 (-1.10)	-0.51 (-0.55)
Aid/GDP*Policy,IQ-EFW	0.21* (1.76)	0.58 (1.43)	0.19** (2.49)	0.32** (2.06)	0.09 (0.92)	0.11 (0.44)	0.12 (1.35)	0.10 (0.55)
(Aid/GDP)2*Policy,IQ-EFW	-0.02** (-2.22)	-0.07* (-1.75)			-0.01 (-1.18)	-0.004 (-0.17)		
Test for exogeneity of the aid variables								
Chi-square. P-value	0.89		0.69		0.90		0.61	
Test for exogeneity of the institutional quality variables and the policy index								
Chi-square. P-value	IQ-EFW	Policy	IQ-EFW	Policy	IQ-EFW	Policy	IQ-EFW	Policy
	0.77	0.44	0.94	0.45	0.02	0.57	0.03	0.82
R2 adj.	0.40	0.24	0.40	0.41	0.40	0.43	0.39	0.40
Observations	189	149	184	144	189	149	184	144

**Notes:** \* Significant at the 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level. The dependent variable is real per capita GDP growth. The t-statistic are the figures in paranthesis.

Looking first at the exogenous variables, some interesting results emerge that are very different from the full sample regressions. Now, in both Table 8 and Table 9, not only the geographical dummy for sub-Saharan Africa is highly significant in all growth regressions but so are the proxy variables for social unrest and financial development. The indicated importance of these variables to economic growth is very interesting, but maybe not so surprising since this smaller sample mainly consists of countries with poor political, social and economical institutions.

In the growth regressions with the policy index, columns 13-16, the results are quite robust to the exclusion of outliers, with almost the same results. The important difference is that in the 2SLS regression in column 16 when the outliers are excluded, the aid\*policy variable is now still significant. Otherwise the results show a clear support for the policy index and its interaction with aid in the OLS regressions, but not in the 2SLS regressions. The OLS regression results are supported by the p-values from the Hausman tests of exogeneity which indicates that all the variables tested for

exogeneity in columns 13-16 indeed can be viewed upon as such in this sample. So, without support from the 2SLS regressions, the importance of the policy index on growth and aid effectiveness has been confirmed. Interestingly the variable for institutional quality has a bit lower coefficients (except in column 16) but has a much higher significance, even in the 2SLS regressions. So among all the significant variables in the OLS regressions, it is only the policy index that is dependent on the correctness of the Hausman test for its legitimacy of results.

In the regressions with institutional quality interacted with aid, columns 17-20, interesting results emerges. Now, the variable for institutional quality aren't significant neither alone nor when it is interacting with aid. Furthermore the policy index is now highly significant in both the OLS and the 2SLS regressions with higher coefficients than in columns 13-16. For the proxy variables for social unrest, financial development and the geography dummy the significant results remains the same as before. What these surprising results from the policy index and institutional quality depend on is hard to say and further examinations of the regression results are warranted, but not necessary for the purpose of this essay since my focus here is on the governance index. But it seems that institutional quality itself cannot improve aid effectiveness, and that its individual effect on growth in low-income countries are dubious. Furthermore, the Hausman test of exogeneity reveals that the variable for institutional quality is highly endogenous at a 5% significance level, and as such renders the OLS regression results flawed with endogeneity problems.

In Table 9, below, I present the results from regressions with the governance index and its interaction with aid in the low-income country sample.

	(21)		(22)		(23)		(24)	
	Outliers				No Outliers			
	OLS	t-Stat	2SLS	t-Stat	OLS	t-Stat	2SLS	t-Stat
Log of Initial GDP	-0,46	-0,55	-1,33*	-1,70	-0,71	-0,81	-1,81**	-2,36
Ethnic fractionalization	-0,82	-0,97	-0,34	-0,32	-1,04	-1,24	-1,02	-1,05
Assassinations	-1,04**	-2,18	-1,20***	-2,70	-0,99**	-2,03	-0,95*	-1,95
Ethnic * Assas	1,24	1,28	1,35	1,44	1,18	1,21	0,95	1,00
Sub-Saharan Africa	-1,94**	-3,19	-3,21***	-3,71	-1,79***	-3,00	-2,31***	-3,18
East Asia	1,06	1,25	1,26	0,97	1,05	1,31	1,17	1,04
M2/GDP (lagged)	0,04**	2,19	0,05**	2,25	0,03**	2,11	0,03**	2,06
Governance index	0,70***	2,69	0,75	1,61	0,65***	3,09	0,73**	2,02
Aid/GDP	-0,02	-0,16	0,13	0,60	-0,19	-1,14	-0,48*	-1,80
Aid/GDP*Gov, index	0,22**	2,39	0,57*	1,84	0,16***	2,75	0,26**	2,20
(Aid/GDP)2*Gov, Index	-0,02***	-3,13	-0,07**	-2,02				
Test for exogeneity of the aid variables								
Chi-square, P-value			0,78				0,83	
Test for exogeneity of the governance index								
Chi-square, P-value			0,07				0,04	
R2 adj.	0,41		0,30		0,41		0,43	
Observations	189		149		185		145	
<b>Notes:</b> * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level, The dependent variable is real per capita GDP growth.								

The regression results when using the governance index is presented in Table 9 above. As in Table 7, the results show a strong support for the importance of governance when it comes to aid

effectiveness and growth. But the endogeneity problem in the institutional quality variable is carried over to the governance variable with a p-value of 0.07 and 0.04, leaving us with only the 2SLS regressions as reliable results to work with.

These results mirrors, and to some degree even strengthens the results from the full sample regressions in Table 7, and the governance index and its interaction variables seems to be quite sensitive to outliers. The same proxy and geography variables are still highly significant, now joined by the level in initial income which is also significant in the 2SLS regressions in both Table 8 and 9. One difference is that the governance variable is now significant first at the 11% level, when including outliers, but becomes significant at the 5% level once the outliers are dropped. Aid interacted with the governance index is highly significant with varied coefficients, but once the outliers are dropped the coefficient of 0.26 is still above the OLS regression results. This regression, column 24, also sees a significant negative impact of aid alone and its explanatory power is the highest of all the regressions at 0.43.

## 5 Conclusion

I have in this essay attempted to answer whether or not good governance affect the effectiveness of aid on economic growth. This is done by letting a variable for institutional quality combined with three policy variables interact with aid and then use this governance index in growth regressions. Consistent with Burnside & Dollar (2000), as well as other research, I find no significant positive relationship between aid and economic growth when using my governance variable instead of the policy variable that Burnside & Dollar uses. In one case, in Table 9 column 24, the relationship is in fact significantly negative.

Something equally interesting is that I also find a significant positive relationship between aid interacted with the governance index and growth, as well as aid interacted with the policy index in the modified regressions with the new variable for institutional quality. This relationship is basically the same as the results Burnside & Dollar (2000) obtained, in general with slightly more significant results. But more importantly is that the key variables; the governance index, the policy index and institutional quality, is now treated as endogenous to growth in the data set used and the variable for institutional quality is now, well justified, changing over time. This change in institutional quality variable, as well as the treatment of IQ and the policy index as endogenous yields different results from that of Burnside & Dollar (2000). The interaction between aid and the policy index is now significant in the full sample, but significant first at a 16% level in the low-income country sample, even when the outliers are included. This is a striking difference to the Burnside & Dollar (2000) results.

When testing for potential endogeneity problems in the above variables, it is only the policy index that cannot be rejected as exogenous in any regression. As expected from theory, institutional quality should be regarded as endogenous to the sample. Since institutional quality is a part of the governance index, the effect is that the governance index itself is now endogenous to the sample. Surprisingly, institutional quality and the governance index are only endogenous in the low-income country case. These results are somewhat surprising. Is there any logic that institutional quality is only endogenous to growth in low income countries, or is this just an expression of unstable data yielding unstable results?

If we are willing to trust the data, one explanation to why IQ is only endogenous to growth in low-income countries could be due to its most volatile nature in poorer countries. Maybe can this answer also help to explain another interesting result, namely that institutional quality has no significant effect on growth by itself in the low income country case, column 17-20. Most middle income countries usually has a certain level of IQ already in place, so the impact that institutional quality has on growth is more easily visible than in the case of a very poor country. Poor countries tend to have more volatile quality of its institutions that does not necessarily follow standard business cycles and the local economic climate. This is indicated by the higher standard deviation in the governance index in the low income country sample case in Table 4.

The puzzling result of the impact of institutional quality on aid effectiveness is in sharp contrast to the other research in the subject mentioned in chapter 1.2.1, as well as the meta study mentioned in the introduction. This difference in results could have many different explanations.

First of all, although the variable for IQ used in this essay is very similar to the one that Balamoune-Lutz and Mavrotas uses, it is not the same variable. But since the two different variables comes from the same sources, the only big difference lies in the intertemporal aspect of the former variable. Furthermore, BLM uses an extended data set with more observations than the original data set used in this essay. Finally, the variable for institutional quality in this essay is lagged, and found to be endogenous to growth. The fact that institutional quality is endogenous to growth is highly likely and supported by theory, as outlined in chapter 2.1.

Another interesting comparison is that the results in Table 6 and 8 are actually supported by BLM when they use the original data set, developed by Burnside & Dollar (Table 2a in BLMs article). It is first when they use the extended data set developed by Easterly et al. (2004) (Table 2b in BLMs article) that they find a significant positive effect that institutions exert on aid effectiveness. The task for further research is to find out whether or not those results hold when using a lagged variable for institutional quality, which changes over time.

The interesting results from the governance variable warrants further analysis. A direct comparison between the results from the full sample regressions and the regressions from the low income country sample is difficult to do. This is because the OLS regression results in the reduced sample cannot be accounted for due to endogeneity problems in the governance variable. But a comparison between the different 2SLS regression results indicates that the importance of governance\*aid is increased in low income countries. This result is the same as with the interaction variable policy\*aid.

Furthermore, in regressions with both the policy index and the governance index, the outliers seem to have a great impact on the results. When outliers are included the coefficients tend to be higher, but some variables lose its significance. An explanation for the higher coefficients could be that an inclusion of the outliers may lead to an overestimation of the regression results in the range where most observations are observed. If the logic outlined above is sound then all my governance-outliers should simultaneously have relatively good or bad values for both the policy- and the institutional quality variable which is in fact also the case<sup>23</sup>. This is the reason for the focus on the regression results when the outliers are excluded.

A comparison between the governance index and the policy index is interesting for several reasons. First of all, due to the mixed results from the regressions with institutional quality\*aid, could it even be justified to include institutional quality in a governance index on pure empirical grounds? Secondly, since we now know of the weak performance of the institutional quality variable, will the governance index underperform or outperform the policy index?

Apart from the strong theoretical arguments, presented in chapter 2, we can see that institutional quality do exerts a positive individual effect on growth. It is only when IQ interacts with aid that this effect is greatly diminished at expense of the policy index whose effect is greatly increased. This puzzling behavior is briefly discussed above. If we now compare the governance index to the policy index, we can see that it in one way underperform the policy index and delivers lower coefficients. This behavior is systematic in both the full sample and when the middle income countries are excluded. But in another way it outperforms the policy index and yields coefficients with higher

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<sup>23</sup> The positive outliers are well above both median and average in the sample and the negative outliers are well below both median and average in the sample. All positive and negative outliers, except for the institutional quality variable in Nicaragua 1990-93, can be found in the first and fourth quartile.

significance level. If we only compare the results in the regressions of interests, this is apparent in columns 11 and 24 compared to columns 3 and 16.

This raises the question as to why the governance index yields slightly lower coefficients but at least as significant results as the policy index when it comes to improving aid effectiveness. The correlation between the policy index and the variable for institutional quality is 0.26, which is a relatively low correlation. It could be the case that the policy index and the variable for institutional quality sometimes complement each other and the combination of these two measurements effect on growth, the governance variable, are therefore producing somewhat lower but at least equally significant results. This could indicate that aid works best in an environment with both sound policies and high quality institutions but that institutions and policies can offset each other. Following this logic, where high quality institutions can compensate for bad policies and vice versa, then the governance index constitutes the preferred index.

## 6 Appendix

**Table A1 - List of countries included in the data set**

sub-Saharan Africa	Latin America	Middle East and North Africa	East Asia	South Asia
Botswana (3)	Bolivia (6)	Algeria (2)	Indonesia (6)	India (6)
Cameroon (5)	Dominican Rep.(6)	Egypt (5)	Korea (6)	Pakistan(6)
Côte d'Ivoire (1)	Ecuador (6)	Morocco (6)	Philippines (6)	SriLanka(6)
Ethiopia (2)	El Salvador (6)	Tunisia (3)	Thailand (6)	
Gambia (6)	Guyana (6)			
Ghana(6)	Haiti (5)	Syria (5)	Malaysia (6)	
Kenya(6)	Honduras (6)	Turkey (1)		
Madagascar (4)	Nicaragua (6)			
Malawi (4)	Paraguay (6)			
Mali (1)				
Niger (2)	Argentina (6)			
Nigeria (6)	Brazil (6)			
Senegal (4)	Chile (6)			
Sierra Leone (6)	Colombia (6)			
Somalia (2)	Costa Rica (6)			
Tanzania (2)	Guatemala (6)			
Togo (4)	Jamaica (3)			
Zaire (5)	Mexico (6)			
Zambia (6)	Peru (6)			
Zimbabwe (3)	Trinidad and Tobago (5)			
	Uruguay (6)			
Gabon (6)	Venezuela (6)			

**Notes:** Middle income countries are in the shaded area. They are defined as, in 1970, having a per capita real GDP greater than 1900 US dollar in constant prices (1985). Nicaragua was excluded from the middle income group since its income level shrank below 1900 US dollars in 1982. The numbers in parenthesis indicates the number of four-year periods for which there is sufficient data for all our variables, where the maximum number of time periods are 6.

<b>Table A2 - Growth Regressions: Using all countries and no outliers</b>				
	Policy index		Governance index	
	<b>OLS</b>	<b>t-Stat</b>	<b>OLS</b>	<b>t-Stat</b>
Log of Initial GDP	-0,45	-0,70	-0,45	-0,76
Ethnic fractionalization	-0,65	-0,85	-0,65	-0,86
Assassinations	-0,41	-1,35	-0,41	-1,39
Ethnic * Assas	0,77	1,53	0,78	1,56
Sub-Saharan Africa	-1,46*	-1,83	-1,46**	-2,05
East Asia	0,71	1,09	0,71	1,11
M2/GDP (lagged)	0,01	0,92	0,01	0,97
IQ - EFW	0,43***	2,82		
Policy index	1,00***	6,15		
Governance index			0,99***	6,90
Aid/GDP	0,02	0,04	0,04	0,13
(Aid/GDP)2	0,01	0,32	0,01	0,33
R2 adj.	0,34		0,34	
Observations	270		271	
<b>Notes:</b> The dependent variable is real per capita GDP growth.				
* Significant at the 10% level; ** Significant at the 5% level;				
*** Significant at the 1% level.				

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