

Helfer, Helena

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## Drivers of economic growth: The special case of Sub-Saharan Africa

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**Drivers of Economic Growth – The Special Case of  
Sub-Saharan Africa**

Helena Helfer

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**Drivers of Economic Growth – The Special Case of  
Sub-Saharan Africa**

*Helena Helfer*

**Abstract**

While global studies on the relationship between democratic institutions and economic prosperity are useful to derive general tendencies, a more insightful analysis is possible by investigating smaller entities. In this study, we focus on a panel of African countries located in the Sub-Saharan region between 1995 and 2016, which provides a solid foundation for empirical analysis and allows for multi-faceted interpretation, especially considering that we observe instability of democratic structures in some parts of this country cluster. The study employs a composite index for measuring democratic institutions. This approach is especially insightful since it takes interrelations between political, economic and societal institutions into account that tend to be overlooked in many studies, which estimate effects of single indicators only. As of now, we find that societal institutions are the most conducive to growth in the region.

**JEL-Codes:** H00, O11, O43, P51

**Keywords:** Democracy, Economic Prosperity, Bundled Measurement, MENA, Sub-Sahara Africa, South America

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University of Münster  
CIW – Center for Interdisciplinary Economics  
Scharnhorststrasse 100  
D-48151 Münster

phone: +49-251/83-24303 (Office)  
e-Mail: [magdalena.balmas@uni-muenster.de](mailto:magdalena.balmas@uni-muenster.de)  
Internet: [www.wiwi.uni-muenster.de/ciw/](http://www.wiwi.uni-muenster.de/ciw/)

# Drivers of Economic Growth – The Special Case of Sub-Saharan Africa

November 29, 2022

While global studies on drivers of economic growth are useful to derive global tendencies, a more insightful analysis that leads to explicit policy implications is possible when investigating smaller entities. In this study, we focus on a panel of 40 African countries located in the Sub-Saharan region. The panel covers the times period from 1995 to 2016. We combine data on institutions with data on economic growth in order to determine which institutions are especially conducive to growth. Our analysis is framed by the approach of a hierarchy of institutions in which political institutions provide a framework in which contemporary political, economic and societal institutions develop and foster economic growth. This framework provides a solid foundation for empirical analysis and allows for multi-faceted interpretation. We find that political institutions, and among them political rights and civil liberties, are the most conducive to economic growth in the region.

**JEL classification** : H00; O11; O43; P51

**Keywords** : Economic Growth; Institutions; Sub-Saharan Africa.

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# 1. Introduction

Empirical studies on institutional determinants of economic growth often focus on global samples of heterogeneous countries across continents. While such an approach is indeed useful to identify tendencies on a global scale, it has inherent limitations in that the sample of observed countries is necessarily too heterogeneous to find conclusive evidence that applies to most if not all countries worldwide. In order to generate evidence that is more specific, we resort to the analysis of a smaller country cluster, namely that of Sub-Saharan African countries. This country cluster is of course quite heterogeneous in itself, but the countries therein face some common challenges, for example when it comes to social issues such as limited health care provision, limited education possibilities, poverty or malnourishment. Furthermore, Sub-Saharan African countries are faced with geography-induced problems and the lasting effects of their colonial history, among others, and there is no denying that these challenges are interrelated. These challenges, that in combination are specific to the region of Sub-Saharan Africa, create a regional context that transcends singular countries and which allows for conclusions for the whole region, all while not denying the heterogeneity of the countries within this country cluster.

In such a challenging environment, we aim at analyzing institutional drivers of economic growth in the region that are geared towards long-term economic performance and that might ease the effects of short-term economic distortions. Some stylized facts for the region taken from the World Bank database reveal a very recent distortion of this sort as economic growth in Sub-Saharan Africa is somewhat volatile as of late. In 2020, the GDP growth rate was measured at 2% and rose to 4% in 2021. The economic growth is expected to decelerate again in the year 2022 as the continent is feeling the aftermath of the Coronavirus pandemic as well as global supply chain problems, high inflation rates and a tightening of global financial conditions. What we are interested in analyzing are the institutional determinants of long-term growth beyond such temporary economic downturns. We want to highlight how the institutions that cause long-term growth in Sub-Saharan Africa, differ from determinants of growth in other regions of the world.

The literature on institutional determinants of economic growth patterns in Sub-Saharan Africa is quite diverse and various analytical analyses. The five main angles will be presented in the following. The first angle of analysis is very broad, as it concerns the political regime type of any given country. The overall theme in the literature

dealing with regime types in Sub-Saharan Africa and economic prosperity is that of a positive impact of democratic institutions on the economic performance in the region. Oftentimes, analyses of the economic effect of democracy in Sub-Saharan Africa start out with a consideration of the other end of the political regime spectrum, stating that authoritarian rule is harmful to the economic performance in Sub-Saharan Africa. Krieckhaus (2004) for example explains this negative effect with the triad of clientelism, patrimonialism and corruption, all of which are prevalent throughout the region. He describes this in even more detail by stating that in Africa, the private and public dimensions are not sufficiently separated, leading to politicians treating public resources as private ones. Democratic institutions enable the citizens to oust such politicians and to vote for a regime that pursues societal and not individual prosperity. Therefore democratic institutions are assumed to be conducive to economic prosperity in Africa. The author finds a positive influence of democracy on long-run economic growth during the observation period from 1960 to 2000 (Krieckhaus, 2004). Further empirical evidence for this perspective can be found in Bates et al. (2012). Their panel consists of 105 countries, among those 42 in Sub-Saharan Africa, from 1955 to 2007. They show that a one-unit rise of the Polity IV index as a measure for democratic institutions promotes a rise in the GDP per capita of 1.5% in the region (Bates et al., 2012).

The second angle of analysis, and probably one of the most analyzed in the literature across disciplines when it comes to Sub-Saharan Africa, is that of the colonial history of the region. Two major analytical frameworks have risen to prominence in this field of research, namely the "legal origins" hypothesis and the concept of "extractive vs. inclusive institutions". The former approach has been championed by researchers such as La Porta et al. (1998), Glaeser and Shleifer (2002) or Djankov et al. (2003). It centers around the idea that the institutions that were established in a given colony are rooted in the legal system of the colonizing country and that the legal origin of the institutions that were established during colonial times continues to have a lasting effect on current institutions. The logic is straightforward: The contemporary institutions are oftentimes based on the institutional settings the colonists left behind when the colonized countries gained their independence and the colonists left. Usually, former French and British colonies are analyzed (and compared) in this context. French colonies were subject to French civil law, which entails a more formalized approach to a judiciary in terms of professional judges and written records, while the British common law, which the British colonies were subject to, relies on lay judges and oral argument (Glaeser/Shleifer, 2002). Overall, the aforementioned authors find that former British colonies nowadays display a

higher institutional quality than former French colonies in terms of government quality, political freedom, property rights and financial development.

The approach of "extractive vs. inclusive institutions" was developed by Acemoglu et al. (2001), who believe that when a country's geographical factors were favorable to the colonial powers, they brought many people to live in the colony and established European institutions, such as property rights or checks and balances on state power, on site. These are referred to as the inclusive (or constructive) institutions. When the geographical factors were unfavorable to European colonists, extractive institutions, which gave an abundance of power to the state and guaranteed colonizers the right to extract natural resources, were created on site. The degree of favorability of the geographic environment is proxied through the rates of settler mortality and the authors concluded that high settler mortality gave rise to the creation of extractive institutions, which in turn resulted in low and volatile growth patterns in the long term.

The third major angle of analysis of determinants of economic development in Sub-Saharan Africa is related to the Acemoglu-argument in that it is linked to the geography of the region. Soil fertility and agricultural production capacities in particular are at the center of many studies. Aspects like the proliferation of certain diseases and uncertain transport capabilities factor into this context as well (Parent, 2018). The following line of reasoning combines these aspects: food production is and always has been difficult in times of drought, which are a frequent occurrence in Sub-Saharan Africa, leading to malnutrition. But when it rains, which is needed especially for agricultural food production, it often brings about diseases that are catastrophic to a malnourished population. In turn, the labor force is reduced which is a major concern for the food production to begin with (Bhattacharyya, 2009). Much of the early work on this topic is related to Sachs and various co-authors, for example J. D. Sachs/A. M. Warner, 1997, Gallup et al., 1999 or Jeffrey D. Sachs/Andrew M. Warner, 2001. More recently, Bolt and Bezemer empirically tested these factors for former French colonies, but did not find any significant evidence that they are related to patterns of economic growth.

The fourth major angle of analysis is that of natural endowments and the potentially ensuing resource curse. This notion describes the anecdotal observation that countries with an abundance of natural assets, such as oil, other fossil fuels or minerals, are adversely affected in economic or developmental outcomes and that such countries do not score well in democracy indices. A number of studies seeks to find evidence of the resource curse phenomenon in Sub-Saharan Africa. Recent studies that analyze the

resource curse phenomenon and provide a good overview on current developments in this field of research include Ross (2015), Havranek et al. (2016), who conduct a meta analysis on the subject, Adams et al. (2019), who analyze institutional patterns in Ghana that help to alleviate the resource curse or Calavcanti et al. (2019), who analyze patterns of economic growth in connection with oil extraction. In empirical studies, comparisons between resource-rich and resource-poor countries are common practice. Recently, Adika (2020) followed such an approach and compared 33 countries in the Sub-Saharan region from 1996 to 2017. The author finds that on average resource-rich countries grow 1.3% more annually than resource-poor countries. He also finds that resource-rich countries in the region profit from a high-quality institutional environment in terms of a stable democracy in order to sustain economic growth, thereby refuting the notion of the resource curse. Our study is not centered around the resource curse, but we do acknowledge the fact that there are context-specific characteristics in terms of good institutions that allow a country to profit economically from its natural resources.

While the aforementioned angles of analysis of economic growth in Sub-Saharan Africa are all somewhat broad, the fifth major angle of analysis refers to (external) economic measures designed to enhance economic growth, for example in the form of foreign aid, mandated structural adjustments or foreign direct investments (FDIs), which are generally considered to be a key component of economic development by political decision makers in the region (Dhahri/Omri, 2020). The literature linking institutions and FDIs in a development context is scarce. One recent example is a study by Agoba et al. (2020) that links foreign direct investments with economic institutions, the later are proxied by central bank independence. They find that the economic institutions per se do not have a significant effect on FDI inflow, but when they account for political institutions, they find that higher levels of political institutions, in terms of respect for the rule of law of a given country, are conducive to the positive influence of economic institutions on FDIs. They also study the reverse relationship and find that high levels of FDIs have a positive impact on economic institutions and that this effect is enhanced when good political institutions are present. Thus, they find a hierarchy of institutions where political institutions moderate the effect of economic institutions.

In order to determine the mechanisms behind economic growth that are specific to Sub-Saharan Africa, we will approach our analysis from a policy-centered perspective in order to produce policy recommendations. We thereby add to the pre-existing angles of analysis. We are aware that policy measures will neither be able to alter the colonial

history in the region nor will they change geographic factors. Therefore, we control for these potential influences on economic growth in the empirical analysis in form of country fixed effects, since these aspects undoubtedly shape any given country, but do not vary over time. In our analysis, we are looking for growth-enhancing mechanisms beyond the abstract regime type, namely for actual institutional channels of transmission that will foster economic growth. Of course, our findings of such institutions will interact strongly with the regime type since only a democratic regime can credibly commit to upholding such institutions, and an autocratic regime cannot.

As a frame of reference for our analysis, we make use of the idea of a hierarchy of institutions. Within this hierarchy, the political institutions create a framework in which contemporary political, economic and social institutions develop. Based on this idea, we then compare the institutions with respect to their growth-fostering influence.

In our empirical analysis of 40 Sub-Saharan African countries between 1995 and 2016, we find that political institutions are most conducive to growth, even more so than economic and societal institutions. Among the political institutions, political rights and civil liberties have the most pronounced effect on economic growth. Our result deviates from the related literature with respect to education and health care, which we measure as part of the societal institutions, which are insignificant in our sample - both when measured in form of a bundled index as well as when measured as single institutions. The related literature on growth in Sub-Saharan Africa agrees that education and health have a positive impact on the production factor of labor, and thus enhance economic growth. In order to have a labor force that can work productively, healthy and educated people are needed, making an institutional environment that contains health care and education a prerequisite. We also compare our findings for Sub-Saharan Africa to a sample of Latin American countries and a sample of resource-rich countries, and we show nuanced differences in determinants of economic growth across these clusters. We furthermore show that our results, for which we focus on GDP per capita growth, are stable also when we focus on GDP per capita levels.

Following this introduction, the remainder of the paper is structured as follows. The theoretical underpinnings of our analysis are explained in section 2. Section 3 outlines the empirical strategy and the data used in the analysis. The estimation results are analyzed in section 4. Section 5 concludes and provides an outlook on future research on the subject.

## 2. Determinants of Growth in the Sub-Saharan Region

In our empirical analysis, we will map the growth-enhancing institutional environment that exists in the region of Sub-Saharan Africa. In that way, we will contribute to the existing literature. Our mapping will be guided by the idea of a hierarchy of institutions, which will enable us to take the interrelations between the political, economic and societal institutions into account and to find out, which of the three are most conducive to growth. The notion of a hierarchy of institutions was first coined by Acemoglu et al. (2005), who distinguish between institutions that are the fundamental cause of growth and those institutions that are the proximate cause of growth, those that are shaped by the fundamental institutions. They conclude that the political institutions are the fundamental cause of economic growth, thereby taking on an indirect role compared to the economic institutions, which are the proximate cause of economic growth. The work of Acemoglu et al. (2005) remains theoretical when it comes to the hierarchy of institutions, an overview of empirical work on the subject can be found in Helfer (2022). Previous theoretical and empirical work on the subject of institutional hierarchies in the context of economic growth were limited to the analysis of the relationship between political and economic institutions. Helfer (2022) created a framework that also contains societal institutions. In this framework of analysis, the political institutions in  $t - 1$  are the deep cause of growth, as they set up the frame in which the contemporary political, economic and social institutions develop in  $t$ , which in turn influence the growth patterns in  $t + 1$ . We will make use of this framework to map the growth-related institutional environment in Sub-Saharan Africa.

## 3. Data and Empirical Strategy

### 3.1. Data

Our analysis is focused on finding determinants of economic growth, hence making economic growth our main outcome variable. We use GDP per capita growth data from the World Bank Development Indicators based on the GDP measured in 2010 US dollars. As the data is given as per capita-data, we use it to control for population effects. For our institutional categories, we use data from the SMEI database (H. Helfer, 2017), since it contains indices for our three targeted institutional categories, namely for the

political institutional quality (PIQ), the economic institutional quality (EIQ) and the societal institutional quality (SIQ). All three indices run from 1 to 10, with 1 denoting the lowest level of the respective institutional quality and 10 the highest. The three indices are available for a balanced panel of 40 Sub-Saharan African countries between 1995 and 2016.

All three indices of PIQ, EIQ and SIQ are comprehensively built as aggregate indices and contain variables that commonly serve as control variables in other empirical studies related to economic growth. Since we want to avoid including too many variables into our model, we employ a set of control variables that are common in growth literature (Justesen/Kurrild-Klitgaard, 2013, p. 458), but are not contained in any of the three indices. Our choice of control variables is guided by the relevant literature. In light of the identified angles of analysis, we include control variables for the governing regime, for resource wealth and for external economic measures. We include a measure for regime stability built from data obtained from the Database of Political Institutions (Beck et al., 2001). We use this to capture the longevity of a governing regime. We do not explicitly control for the regime type of democracy since many typical features of democratic governance are already contained in our institutional categories. We employ a measure for oil production to account for natural endowments. Also, we use the volume of exports and imports respectively to account for the trade volume and we control for the volume of foreign aid. As it is good practice in growth models, we also control for the initial GDP using the natural log of the GDP per capita from the year 1990.<sup>1</sup> All of the latter variables are again taken from the World Bank Development Indicators. We use a country fixed effects model in order to control for the colonial history and also for geographical factors that do not vary over time but that potentially impact on economic growth. Table 1 presents the descriptive statistics for our variables.

The pairwise correlation matrix of our explanatory variables can be found in table A.1 in the appendix. The correlation coefficients allow for assumptions regarding the separation precision of the variables, with high correlations indicating low separation precision. According to Grogan and Moers (2001), coefficients with a value greater 0.7 are of concern in that regard. The correlation coefficients of the institutional categories are below the threshold, but close to it. High correlations between the institutional bundles are not surprising because institutional factors related to economic growth are difficult to separate. There are also content-related overlaps. While most correlation coefficients

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<sup>1</sup>Note that this control variable only produces a few coefficients since it is mostly dropped for reasons of collinearity.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Growth GDP pc	883	2.317	7.302	-36.557	140.371
PIQ	902	5.328	1.349	1.975	8.378
EIQ	902	5.994	.921	2.2	7.99
SIQ	902	5.765	.675	4.392	7.85
Import	734	8670.273	18277.35	76.682	132000
Export	734	9491.378	21896.42	51.729	124644.3
Regime Stability	880	14.622	14.115	1	86
Foreign Aid	902	694.008	855.879	-18.41	11879.08
Oil Prod	457	10138.17	27179.44	0	125059.6
ln GDPpc (1990)	880	6.821	.914	5.338	9.32

in the table are not remarkable and indicate a good separation precision, the trade variables of import and export are highly correlated. This is hardly surprising, since countries usually trade in both directions if they engage in trading activities at all.

Using the Variance Inflation Factor (VIF) test, we test our explanatory variables for multicollinearity. This test is important to consider since an increase in the degree of multicollinearity potentially leads to instability in the estimates of the coefficients and to inflated standard errors. Generally, a VIF value greater than 10 is considered worrisome. Only our export variable is above this threshold, and our import variable is close to the threshold. Again, it is feasible that these are highly correlated with more than one other variable due to their comprehensive nature - all countries in our panel of 40 countries at least participate in some trade activity. Table 2 displays the VIF scores.

Table 2: Variance Inflation Factor Test

Variable	VIF	1/VIF
Export	11.08	0.090260
Import	9.62	0.103919
Regime Stability	3.85	0.259805
PIQ	3.23	0.309553
SIQ	2.78	0.359603
Oil Prod	2.50	0.400599
EIQ	2.48	0.402983
ln GDPpc (1990)	1.82	0.547973
Foreign Aid	1.49	0.672617
Mean VIF	4.32	



### 3.2. Empirical Strategy

In order to map the institutional environment in Sub-Saharan Africa, we make use of the two step procedure established in Helfer (2022). We start by gathering information on the hierarchical structure of the institutions. To that end, we measure the influence of the lagged political institutions on our contemporary institutional categories. This approach to identifying the hierarchies follows these linear panel models:

$$\begin{aligned}
 PIQ_{i,t} &= \beta_0 + \beta_1 PIQ_{i,t-lag} + C_{i,t-lag}\beta_2 \\
 &\quad + \alpha_i + \delta_t + \epsilon_{i,t} \\
 SIQ_{i,t} &= \beta_0 + \beta_1 PIQ_{i,t-lag} + C_{i,t-lag}\beta_2 \\
 &\quad + \alpha_i + \delta_t + \epsilon_{i,t} \\
 EIQ_{i,t} &= \beta_0 + \beta_1 PIQ_{i,t-lag} + C_{i,t-lag}\beta_2 \\
 &\quad + \alpha_i + \delta_t + \epsilon_{i,t}
 \end{aligned}$$

Then, we measure the influence of the institutional categories on economic growth that we can interpret based on the backdrop of our hierarchy. Our model for estimation using GDP growth as dependent variable follows

$$\begin{aligned}
 gGDP_{i,t} &= \beta_0 + \beta_1 \ln GDP_{i,initial} + X_{i,t-lag}\beta_2 + C_{i,t-lag}\beta_3 \\
 &\quad + X_{i,t-lag} \times \ln GDP_{i,initial}\beta_4 + \alpha_i + \delta_t + \epsilon_{i,t}
 \end{aligned}$$

where the vector  $X_{i,t-lag}$  refers to the institutional categories of PIQ, EIQ and SIQ consecutively, the control variables are denoted as the vector  $C_{i,t-lag}$ ,  $\alpha_i$  and  $\delta_t$  designate the country fixed effects that absorb the influence of time-invariant country-characteristics as outlined above, and time fixed effects respectively. All other possible time-varying unobservable shocks to our outcome variable are included in the  $\epsilon_{i,t}$ . Note that the institutional categories are included in lagged form. This is very useful: on the one hand it is intuitive based on our theoretical considerations, and on the other hand, it is helpful to ease the problem of endogeneity and that of autocorrelation. Data analyses on institutions and economic growth generally need to address endogeneity concerns since the causality may plausibly run in both directions.

We are estimating a GMM model, in which lagged levels of the endogenous explanatory variables are used as internal instruments. Thus, the endogenous variables are pre-determined and therefore not correlated with the error term. We furthermore replace our GMM-style instruments with their principal components. This method has the advantage that the overall instrument count is reduced, which in turn strengthens the explanatory power of our coefficients. Also, we employ standard errors that are clustered at the country level.

In all our estimation tables, we report diagnostic test statistics that are specific to a GMM model environment. We run a Sargan/Hansen-test for joint validity of the instruments. There is an inherent problem with these tests, when it comes to finite datasets such as ours. The GMM estimators can generate moment conditions to such an extent, with the instrument count being quadratic in the time dimension of the panel, that a finite dataset may lack the information to estimate the variance matrix properly. The creator of the GMM estimator we are using reports that this phenomenon does not compromise the consistency of the estimators, but that it can weaken the Sargan/Hansen-test for overidentification in a way that it gives implausibly good p-values. Unfortunately, simply reducing the number of instruments employed does not help because there is no consistent guidance in the literature with respect to how many instruments are too many and how many instruments are too little. Too few instruments could also potentially lead to bias, statistically and also content-related (Roodman, 2009a). In addition to the Sargan/Hansen-test, we execute the Arellano/Bond-test for autocorrelation in the error term, which would render some lags invalid as instruments. Generally, we want the test for AR(1) processes in first differences to be close to zero, and the test for AR(2) processes in levels closer to one, and in any case to be larger in magnitude than the test for AR(1) processes, with the exact p-value thresholds still being debated in the relevant literature (Roodman, 2009b). In consequence of this vagueness, we will report our test diagnostics and be cautious with the interpretation in cases where the results might be inconsistent because the test statistics indicate the latter.

## 4. Results and Discussion

Table 3 describes the results of the hierarchy estimation. It shows that the past political institutions, which represent the framework in which the contemporary growth-fostering institutions take shape, does indeed have a significant influence on our three institu-

tional categories, but only if we include the control variables. For the economic and the societal institutions, we also observe a significant and positive influence without control variables. When we only consider those estimations which include control variables, the coefficients are larger in magnitude than without the controls. We see that the significant positive effect of the past political institutions as deep cause of growth is largest for the present political institutions. This result was expected since it is intuitive that past political institutions shape the present political institutions. The impact of the past political institutions is more pronounced for the economic institutions than for the societal institutions. This result indicates a hierarchy of the sort that past political institutions, as the deep cause of growth, impact mostly on the present political institutions, but also have some influence on economic and societal institutions, though not as pronounced as with the political institutions.

Table 3: Hierarchy Estimation

VARIABLES	(1) PIQ	(2) PIQ	(3) EIQ	(4) EIQ	(5) SIQ	(6) SIQ
Lagged PIQ	0.000486 (0.0752)	0.611*** (0.0719)	0.185* (0.0958)	0.359* (0.189)	0.103** (0.0401)	0.216*** (0.0433)
Import		-0.0000443** (0.0000203)		0.000005.17 (0.00000380)		0.00000114 (0.000000937)
Export		0.00000320* (0.00000170)		0.00000477 (0.00000285)		-0.00000279* (0.00000145)
Regime Stability		0.00149 (0.0248)		-0.0578 (0.0341)		0.00780 (0.0135)
Foreign Aid		-0.000000298 (0.0000114)		-0.0000258 (0.0000322)		0.00000301 (0.00000593)
Oil Prod		-0.00000697*** (0.000001.94)		0.00000563 (0.000004.18)		0.00000882** (0.00000343)
Constant	3.107*** (0.257)	1.868** (0.890)	3.784*** (0.347)	4.746*** (0.955)	5.084*** (0.135)	4.386*** (0.422)
AR(1) p-value	0.041	0.001	0.271	0.191	0.002	0.018
AR(2) p-value	0.042	0.806	0.542	0.161	0.677	0.122
Sargan Test p-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen Test p-value	1.000	1.000	1.000	1.000	1.000	1.000
Observations	861	384	861	384	861	384
Number of Countries	41	20	41	20	41	20

Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4 presents the results of the estimation with GDP per capita growth as dependent variable and with the three institutional categories as explanatory variables. In the estimations without controls, we find that only the coefficient for the political institutions is significant at the 10% level and that it carries a negative sign, which is somewhat counter-intuitive, because it would imply that less qualitative political institutions foster economic growth. As soon as we add the control variables however, the coefficient for the political institutions carries a positive sign and is now even significant at the 1% level.

The other coefficients for our institutional categories remain insignificant and therefore do not contribute to explaining the GDP growth. We also see some explanatory value in the trade variables, where the coefficients are very small in size. This is due to the scaling of the variables. The export-coefficients carry a negative sign, the import coefficients carry a positive sign. The coefficients for regime stability are also significant, at the 5% or at the 10% level. They carry a negative sign as well, which implies that changes in the political regime stimulate economic growth, which is intuitive since a new government often provides a stimulus to the economy, especially if a campaign was run based on macroeconomic promises and the newly-elected government wants to deliver what it promised.

Table 4: Institutional categories and GDP per capita growth in Sub-Saharan Africa

	(1)	(2)	(3)	(4)	(5)	(6)
	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc
PIQ	-3.468*	1.348**				
	(1.730)	(0.601)				
EIQ			-8.361	-0.184		
			(7.228)	(0.710)		
SIQ					20.64	-1.241
					(24.88)	(2.320)
Import		0.0000504***		0.0000419*		0.0000419*
		(0.0000166)		(0.0000217)		(0.0000220)
Export		-0.0000607***		-0.0000414*		-0.0000449*
		(0.0000203)		(0.0000227)		(0.0000220e)
Regime Stability		-0.616**		-0.795*		-0.804**
		(0.290)		(0.385)		(0.376)
Foreign Aid		-0.00000127		-0.0000252		0.00000125
		(0.000202)		(0.000219)		(0.000240)
Oil Prod		-0.0000527**		-0.0000341		-0.00000212
		(0.0000197)		(0.0000230)		(0.0000345)
Constant	12.52**	19.77*	37.24	29.31**	-109.1	35.20
	(4.873)	(9.972)	(30.23)	(13.33)	(133.8)	(20.37)
AR(1) p-value	0.002	0.018	0.083	0.002	0.103	0.002
AR(2) p-value	0.677	0.122	0.027	0.643	0.045	0.819
Sargan Test p-value	0.000	0.000	0.000	0.037	0.000	0.038
Hansen Test p-value	1.000	1.000	1.000	1.000	1.000	1.000
Observations	840	384	840	384	840	384
Number of Countries	40	20	40	20	40	20

Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Since not all countries in Sub-Saharan Africa are naturally endowed with oil, and thus do not produce any oil, we loose these countries in our estimation when we include the oil production-control variable. Therefore, we run the same estimation again, but we exclude the control variable for oil production. Table 5 presents the results for this estimation. Most of the variables remain unchanged, the regime stability and the trade variables loose some statistical significance. When we look at our institutional categories, we find that, in the estimation with control variables, the economic institutions

are statistically significant at the 10% level and that they carry the positive sign. The coefficient for the political institutions remains positive and significant, but now only at the 5% level. This result consolidates the finding with regard to the growth-fostering influence of the political institutions, but caution is in order when interpreting the positive coefficient of the economic institutions since we know that the statistical significance will vanish as soon as we add the oil production as explanatory variable. Across specifications, the societal institutions remain insignificant.

Table 5: Institutional categories and GDP per capita growth in Sub-Saharan Africa (no control for oil production)

	(1)	(2)	(3)	(4)	(5)	(6)
	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc
PIQ	-3.468*	1.870**				
	(1.730)	(0.717)				
EIQ			-8.361	0.832*		
			(7.228)	(0.415)		
SIQ					20.64	-0.0498
					(24.88)	(2.056)
Import		0.0000398		0.0000229		0.0000437
		(0.0000239)		(0.0000230)		(0.0000277)
Export		-0.0000885***		-0.0000506**		-0.0000557*
		(0.0000263)		(0.0000208)		(0.0000309)
Regime Stability		0.396		0.123		0.0403
		(0.245)		(0.208)		(0.222)
Foreign Aid		0.000527		0.000377		0.000146
		(0.000488)		(0.000378)		(0.000292)
Constant	12.52**	-15.47**	37.24	-5.106	-109.1	1.217
	(4.873)	(6.532)	(30.23)	(6.306)	(133.8)	(14.24)
AR(1) p-value	0.083	0.001	0.082	0.001	0.103	0.001
AR(2) p-value	0.027	0.329	0.134	0.216	0.045	0.204
Sargan Test p-value	0.000	0.047	0.000	0.014	0.000	0.018
Hansen Test p-value	1.000	1.000	1.000	1.000	1.000	1.000
Observations	840	694	840	694	840	694
Number of Countries	40	38	40	38	40	38

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

So far, the political institutions have the most explanatory value out of our three institutional categories in explaining GDP growth. As a next step, we will unbundle this variable and look at its components to see which of its components is the main driving factor of this result. It is composed of a measure for political rights, a measure for civil liberties, both taken from the Freedom House dataset, a measure for freedom from corruption from Transparency International, and a measure for adequate government spending from the Heritage Foundation dataset. Table 6 presents the results. Out of the three components of the PIQ, only the political rights and the civil liberties have a positive and significant effect on GDP growth, the other components are not statistically significant. The effect is most pronounced for the political rights.

Table 6: Components of PIQ and GDP per capita growth in Sub-Saharan Africa

	(1)	(2)	(3)	(4)
	G GDPpc	G GDPpc	G GDPpc	G GDPpc
Pol Rights	0.903*** (0.243)			
Civil Liberties		0.490* (0.252)		
Free from Corruption			-0.370 (0.384)	
Gov Spending				-0.461 (0.638)
Import	0.0000540** (0.0000206)	0.0000365 (0.0000295)	0.0000333 (0.0000321)	0.0000349 (0.0000340)
Export	-0.0000570** (0.0000211)	-0.0000494** (0.0000195)	-0.0000486** (0.0000177)	-0.0000313 (0.0000228)
rs	-0.157*** (0.0527)	-0.198*** (0.0543)	-0.199*** (0.0556)	-0.175*** (0.0587)
aid	0.000201 (0.000311)	0.000317 (0.000349)	0.000369 (0.000378)	0.000322 (0.000334)
oilprod	-0.0000418** (0.0000156)	-0.0000461** (0.0000177)	-0.0000286* (0.0000158)	-0.0000335* (0.0000181)
Constant	7.690*** (2.336)	9.717*** (2.558)	11.30*** (3.076)	12.31*** (4.198)
AR(1) p-value	0.001	0.001	0.001	0.002
AR(2) p-value	0.653	0.584	0.631	0.768
Sargan Test p-value	0.000	0.047	0.000	0.014
Hansen Test p-value	1.000	1.000	1.000	1.000
Observations	384	384	384	384
Number of Countries	20	20	20	20

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

In the following, we will compare these results to estimations for other country clusters in order to determine if Sub-Saharan Africa is indeed a special case, or if the determinants of economic growth are similar across different country clusters. For consistency reasons, we employ the exact same model specification for all following estimations as we did for the previous one. Table 7 presents the estimation results for a country cluster of 20 Latin American countries, which we chose because Latin America is on an at least somewhat similar level of development compared to Sub-Saharan Africa and the two country clusters face similar challenges when it comes to geography and colonial history. For the Latin American country cluster, we find no significant coefficients for our three institutional categories in our estimations both with or without control variables. Therefore, our variables can not explain the GDP per capita growth in this region. Note that data for regime stability was dropped for collinearity reasons.

Table 7: Institutional categories and GDP per capita growth in Latin America

	(1)	(2)	(3)	(4)	(5)	(6)
	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc
PIQ	1.416 (1.441)	-0.655 (0.734)				
EIQ			-1.679 (1.613)	-1.263 (0.903)		
SIQ					5.390 (3.166)	-0.597 (2.519)
Import		-0.0000184 (0.0000163)		-0.0000177 (0.0000150)		-0.0000100 (0.0000159)
Export		0.0000107 (0.0000160)		0.0000250 (0.0000242)		0.0000516 (0.0000175)
Foreign Aid		-0.000457 (0.00172)		-0.00219 (0.00126)		-0.00200 (0.00128)
Oil Prod		0.0000254 (0.0000368)		0.0000350 (0.0000422)		0.0000272 (0.0000412)
Constant	-5.833 (7.133)	5.037 (3.168)	15.10 (10.65)	16.65** (7.233)	-36.58 (23.32)	6.808 (18.37)
AR(1) p-value	0.010	0.009	0.003	0.012	0.008	0.008
AR(2) p-value	0.087	0.131	0.085	0.086	0.118	0.103
Sargan Test p-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen Test p-value	1.000	1.000	1.000	1.000	1.000	1.000
Observations	418	376	418	376	418	376
Number of Countries	20	18	20	18	20	18

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The results for the estimation with a country cluster of 61 resource-rich countries are presented in table 8. Since resource wealth is frequently discussed in connection with Sub-Saharan Africa, we consider resource-rich countries a valuable source for comparison. In this country cluster, we have a mixture of income poor countries, such as Nigeria, but also of income rich countries, such as Norway or Saudi Arabia, which are both rich in natural resources. The notion of natural resources is not limited to oil but includes other

subsoil assets, such as minerals. Note that the output table contains coefficients for the  $\ln$  GDP pc from 1990, which in this case is not dropped for collinearity reasons. First, we consider our institutional categories. While we find no significant coefficients for the political institutions, we find significant coefficients for the economic institutions. They carry the negative sign in the estimation with and without controls and are significant at the 5% and at the 1% level respectively. This finding implies that economic institutional quality has a negative impact on economic growth in our sample of resource-rich countries. The SMEI dataset, which gives us the institutional categories, describes a social order that resembles a democracy rather than an autocracy. This is not to say that certain institutions included in the institutional categories could not exist in an autocratic system, but all institutions across all three categories taken together describe a democracy rather than an autocracy. Since most of the resource-rich countries in our sample do not score high in democracy indices, it is plausible that economic institutions, commonly found in a democracy, such as central bank independence or a creative business environment, are not correlated with growth in non-democratic countries, and that the coefficients in our table are negative for this reason. We do find another significant coefficient for our institutional categories, and that is for the societal institutions in the estimation without the controls. As soon as the controls are added, the societal institutions lose their explanatory value. It is striking that oil production is not broadly significant across specification. We only see a significant coefficient in the estimation with the SIQ. Other than that, we do not see any statistical significance in the table. The reason might be that the sample is too heterogeneous when it comes to the kind of resources the countries are endowed with.

So far, we found political institutions, and among those, political rights and civil liberties, to be most conducive to growth in Sub-Saharan Africa. This is also consistent with our hierarchy estimation, where we also found that the deep cause of growth, namely the past political institutions, mainly have a positive effect on the contemporary political institutions, and not so much on the economic or societal institutions. We compared this result to a cluster of Latin American and resource-rich countries, where we did not find similar results, thus making Sub-Saharan Africa a special case. So far, we relied on GDP per capita growth data for our main outcome variable. In order to broaden our perspective, we repeated our analysis with the natural log of the GDP per capita as outcome variable, the respective estimation tables can be found in the appendix. In the relevant literature, we find both GDP growth rates and natural logs of GDP per capita as proxies for the construct of economic prosperity. If we have panel data with a long



Table 8: Institutional categories and GDP per capita growth in resource-rich countries

	(1)	(2)	(3)	(4)	(5)	(6)
	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc	G GDPpc
PIQ	-2.085 (3.926)	-0.0829 (1.109)				
EIQ			-4.786** (2.146)	-2.376*** (0.861)		
SIQ					18.63*** (6.454)	2.275 (2.928)
ln GDPpc (1990)	-1.998 (1.962)		-0.214 (0.333)		1.875* (0.981)	
Import		-0.00000552 (0.0000175)		-0.0000109 (0.0000177)		-0.00000768 (0.0000177)
Export		0.00000544 (0.0000178)		0.0000191 (0.0000197)		0.00000633 (0.0000170)
Regime Stability		0.149 (0.173)		0.119 (0.134)		0.118 (0.156)
Foreign Aid		-0.000287* (0.000157)		-0.000543** (0.000270)		-0.000500** (0.000231)
Oil Prod		0.0000540 (0.0000327)		0.0000417 (0.0000284)		0.0000553* (0.0000297)
Constant	26.40 (33.21)	-5.611 (10.67)	32.90*** (10.75)	9.177 (9.174)	-119.8*** (44.53)	-17.94 (19.21)
AR(1) p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.104	0.091	0.042	0.078	0.041	0.083
Sargan Test p-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen Test p-value	0.727	1.000	0.803	1.000	0.735	1.000
Observations	1,279	984	1,279	984	1,279	984
Number of Countries	61	52	61	52	61	52

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

time dimension, it is useful to focus on the natural log of the GDP per capita as changes in GDP per capita and economic development are easy to see. In our panel, we have 21 years in the time dimension, which is at the lower end of what is commonly referred to as a long panel. We cannot add more years to our panel as we are restricted by the availability of the data for the institutional categories.

Table B.1 presents the findings for our institutional categories in Sub-Saharan Africa. We only find one significant coefficient in our institutional categories, and that is for the political institutions in the estimation with the control variables. This corroborates our previous findings from the estimation with the GDP growth as outcome variable for the Sub-Sahara region. We then once more resort to comparisons with the Latin American and the resource-rich country clusters. In table B.2, we see the coefficients for the Latin American country cluster. Again, we find statistical significance for the coefficient of the political institution in the estimation with the control variables. In the estimation with the GDP growth, this was not the case for this country cluster. Table B.3 presents the results for the resource-rich countries. In this country cluster, we find significance only for the economic institutions, but only in the estimation without controls. As soon as we add controls, the explanatory value vanishes. Also in the estimations with the GDP per capita as outcome variable, we found significance for the economic institutions in the cluster of resource-rich countries, but unlike in the present case, we found it in the estimation with control variables. Overall, the results from the estimations with the natural log of the GDP per capita as outcome variable confirm our previous finding regarding the importance of political institutions for economic development.

Our results do not align with the previous literature on the subject. In development economics literature, it has been common practice for decades to resort to the notion of human capital as a main determinant of growth. Among others, Becker (1993) defined human capital as the skills, abilities, competencies and knowledge an individual possesses. Early work linking human capital to economic growth was done by Romer (1986), Mankiw et al. (1992) and Barro and Sala-i-Martin (2004), more recent examples include Hartwig (2010) or Qadri and Waheed (2014), the latter focusing on the example of Pakistan. A recent paper by Ogundari and Awokuse (2018) combines the classic Solow model and the human capital-focused perspective as they work with an augmented version that includes human capital. Their empirical study of a sample of 35 Sub-Saharan African countries focuses on a specific definition of human capital as both education and health, and they estimate the relative effect sizes on growth. They

find that while both have a positive effect on GDP growth, health has a larger effect than education. They link this finding to the quality of the education in the region, and thereby follow the argument of Glewwe et al. (2014), who study the effect of education on economic growth. Ogundari and Awokuse (2018) added novelty to the discussion as they did a joint study of education and health, which was previously only undertaken by Li and Liang (2010), but in this case for the region of East Asia. Gyimah-Brempong did a similar study, divided in two papers: In 2004, they published a study on the effect of healthcare on growth in Sub-Saharan Africa (Gyimah-Brempong/Wilson, 2004) and in 2006, they published a study on the effect of education on growth in Sub-Saharan Africa (Gyimah-Brempong/Paddison/Mitiku, 2006). Most other studies analyze only one of these two facets of human capital.

Education and health care are two variables that are contained in our measure for societal institutions. Across all our specifications with control variables, we did not find significant coefficients for societal institutions in our sample. When we did not control for foreign aid and oil production, we found coefficients that align perfectly well with the previous literature. As in these estimations, health care and education were the main drivers of growth, but since these estimations are incomplete with regard to the necessary control variables, we do not regard them as valid results.<sup>2</sup> It could be that some of the other studies also did not control for natural resources or foreign aid, or that there are sample-specific distortions that explain the differences in results. However, we find our results to be plausible. The political institutions of the past set up a framework, in which the contemporary political institutions take full effect and set up an institutional environment in which the production factor of labor can thrive particularly well in the case of Sub-Saharan Africa and that is conducive to economic growth in the region.

## 5. Further Research and Conclusion

In our analysis of institutional determinants of growth in the region of Sub-Saharan Africa, we added to the pre-existing literature by mapping the growth-enhancing institutional environment in Sub-Saharan Africa. We found that political institutions, and among those political rights and civil liberties, are the drivers of growth. Therefore, countries in Sub-Saharan Africa are advised to guarantee such rights and liberties, for

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<sup>2</sup>Tables available upon request from the author. We do not report the tables in this paper as they do not include all necessary control variables and thus do not contribute any relevant findings to this work.

example through a guarantee of electoral rights or through the freedom to rally. If the growth-generating properties of the political institutions are put to their best use, they can feed into the region's great potential: the next generation of young people entering the labor force and potentially being capable of being more productive than their predecessors. According to World Bank data, more than one billion people call the region of Sub-Saharan Africa home and by 2050 half of its population will be under the age of 25.

In future research, it might be of use to break the cluster of Sub-Saharan African countries down further in accordance with certain characteristics, for example in accordance with the origin of foreign investments. While we have found that fully developed political institutions are conducive to growth, underdeveloped political institutions might also be a root of economic growth in very specific contexts. It is known that countries like China or India are investing specifically in countries in Sub-Saharan Africa to build infrastructure, among other ventures. This engagement on the part of the Chinese and Indian governments does not necessarily rely on the local labor force in the respective regions as the investors usually import their own labor force. Most likely, the political institutional quality will not be as pronounced in regions where the investors can establish such a diaspora. But since the infrastructure projects do fuel economic growth, limited political institutions might in this case be a contributing factor to achieve economic growth. This is just one example of a detailed analysis that could build on our finding of the political institutions as a major determinant of growth.

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# Appendix

## A. Pairwise Correlations



Table A.1: Pairwise Correlations

Variables	PIQ	EIQ	SIQ	Imp.	Exp.	Reg. Stab.	For. Aid	Oil Prod	ln GDPpc
PIQ	1.000								
EIQ	0.594	1.000							
SIQ	0.656	0.461	1.000						
Imp.	0.180	0.159	0.327	1.000					
Exp.	0.141	0.135	0.262	0.941	1.000				
Reg. Stab.	0.401	0.308	0.568	0.620	0.568	1.000			
For. Aid	0.049	-0.023	0.131	0.275	0.246	0.012	1.000		
Oil Prod	-0.292	-0.173	-0.186	0.415	0.531	-0.089	0.092	1.000	
ln GDPpc	0.191	0.267	0.315	0.367	0.397	0.497	-0.264	0.194	1.000

## B. Estimation Tables of the analysis with the natural log of the GDP per capita

Table B.1: Institutional categories and ln GDP per capita in Sub-Saharan Africa

	(1)	(2)	(3)	(4)	(5)	(6)
	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc
PIQ	0.0358 (0.0228)	0.0558* (0.0288)				
EIQ			-0.0149 (0.0289)	0.0682 (0.0464)		
SIQ					-0.239 (0.188)	0.0915 (0.0654)
Import		0.000000475 (0.000000861)		0.000000210 (0.000000891)		0.000000162 (0.000000995)
Export		0.00000340*** (0.000000925)		0.00000348*** (0.000000980)		0.00000401*** (0.000000891)
Regime Stability		0.00360 (0.00853)		-0.00325 (0.00820)		-0.000362 (0.00892)
Foreign Aid		-0.000000297 (0.00000451)		-0.000000551 (0.00000670)		-0.00000281 (0.00000411)
Oil Prod		0.00000276*** (0.000000743)		0.00000226** (0.000000903)		0.00000244*** (0.000000784)
Constant	7.713*** (0.0870)	7.372*** (0.256)	7.887*** (0.122)	7.496*** (0.295)	9.108*** (0.995)	7.172*** (0.419)
AR(1) p-value	0.087	0.384	0.072	0.351	0.044	0.451
AR(2) p-value	0.147	0.114	0.136	0.175	0.127	0.030
Sargan Test p-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen Test p-value	1.000	1.000	1.000	1.000	1.000	1.000
Observations	840	384	840	384	840	384
Number of Countries	40	20	40	20	40	20

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table B.2: Institutional Categories and ln GDP per capita in Latin America

	(1)	(2)	(3)	(4)	(5)	(6)
	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc
PIQ	0.0243 (0.0142)	0.0520** (0.0245)				
EIQ			-0.0446 (0.0575)	-0.00413 (0.0197)		
SIQ					0.0253 (0.0677)	0.0715 (0.0600)
Import		0.000000129 (0.000000424)		-0.000000220 (0.000000499)		-0.000000496 (0.000000479)
Export		-0.000000504 (0.000000369)		-0.000000812 (0.000000513)		-0.000000316 (0.000000395)
Foreign Aid		-0.000107** (0.0000371)		-0.0000915*** (0.0000237)		-0.0000818** (0.0000285)
Oil Prod		0.00000153* (0.000000792)		0.00000203** (0.000000951)		0.00000208*** (0.000000693)
Constant	6.512*** (0.0744)	6.255*** (0.122)	9.602*** (0.373)	8.877*** (0.159)	8.788*** (0.504)	8.404*** (0.438)
AR(1) p-value	0.000	0.106	0.000	0.002	0.000	0.002
AR(2) p-value	0.413	0.299	0.212	0.767	0.160	0.800
Sargan Test p-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen Test p-value	1.000	1.000	1.000	1.000	1.000	1.000
Observations	418	376	418	376	418	376
Number of Countries	20	18	20	18	20	18

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table B.3: Institutional Categories and ln GDP per capita in resource-rich countries

	(1)	(2)	(3)	(4)	(5)	(6)
	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc	ln GDPpc
PIQ	0.0107 (0.0196)	-0.00887 (0.0311)				
EIQ			0.0883** (0.0429)	0.00163 (0.0364)		
SIQ					-0.0184 (0.0661)	-0.00848 (0.103)
ln GDPpc (1990)	0.886*** (0.00978)		0.867*** (0.00666)		0.878*** (0.0100)	
Import		-0.000000545 (0.000000386)		-0.0000006300 (0.000000465)		-0.000000536 (0.000000443)
Export		0.000000913** (0.000000451)		0.000000999** (0.000000422)		0.000000930* (0.000000514)
Regime Stability		0.00291 (0.00208)		0.00296 (0.00227)		0.00401* (0.00219)
Foreign Aid		-0.000000540 (0.0000104)		-0.000000609 (0.0000107)		-0.000000790 (0.0000123)
Oil Prod		0.000000642 (0.000000978)		0.000000626 (0.000000901)		0.000000688 (0.000000914)
Constant	0.946*** (0.166)	6.669*** (0.234)	0.592*** (0.221)	6.602*** (0.287)	1.164** (0.454)	6.600*** (0.636)
AR(1) p-value	0.000	0.005	0.001	0.004	0.000	0.005
AR(2) p-value	0.002	0.014	0.162	0.017	0.002	0.019
Sargan Test p-value	0.000	0.000	0.000	0.000	0.000	0.000
Hansen Test p-value	0.618	1.000	0.039	1.000	0.000	1.000
Observations	1,279	984	1,279	984	1,279	984
Number of Countries	61	52	61	52	61	52

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

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