

Natural Resource Rents, Institutional Quality, and Entrepreneurship: Are Highly Endowed African Nations Cursed?

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Abstract

This paper empirically analyzes the impact of natural resource rents and institutional quality on new business density, a critical measure of entrepreneurship. In a panel dataset of 28 African countries covering the period 2002-2014, the paper finds that the direct effect of resource rents on entrepreneurship is positive and significant, whereas the quadratic effect of resource rents is negative and significant. This implies that large amounts of resource rents can be a curse by adversely affecting entrepreneurial activity. The results also demonstrate that new business activity is significantly harmed by a lack of high quality institutions. Furthermore, the paper finds that resource rents enhance entrepreneurship in nations with superior institutional quality.

Keywords: natural resource rents, institutions, entrepreneurship, crowding-in, rent-seeking

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1. Introduction

The empirical literature on the relationship between a country's natural resources and its economic performance highlights what is commonly referred to as the "natural resource curse"-- the notion that countries with abundant mineral deposits such as oil, natural gas, diamonds and other valuable natural resources tend to grow slower on average than countries that are not resource rich. Some commonly cited examples of countries that have experienced a resource curse include oil-rich Nigeria, Sudan, and Venezuela and diamond rich Congo and Sierra Leone. They have not been as successful as Korea, Taiwan, Hong Kong or Singapore who became Asian tigers even though they lack natural resource wealth. To be sure, there are some exceptions like Botswana and Norway-- both have performed well and have not been cursed by possessing large endowments of natural resources. However these exceptions are few and the fact remains that many countries, particularly in the developing world seem to be cursed by their natural resource wealth.

Empirical explanations of the resource curse include a "Dutch disease" effect, whereby a natural resource boom increases the demand and price of non-tradable goods relative to traded goods (other than the booming natural resource), causing the real exchange rate to become overvalued. Related macroeconomic and sectoral empirical evidence has shown that declining competitiveness and deindustrialization resulting from real exchange rate overvaluation are important explanations of the resource curse (Sachs and Warner, 2001; Corden, 1984; Harding and Venables, 2010; Ismail, 2010; and Brahmhatt et. al 2010). In other studies, natural resources are a curse because they crowd-out investment in human capital (education) as well as investment in physical capital (Gylfason, 2001 and Gylfason and Zoega, 2006).

The resource curse could also be explained by the fact that rents generated by a resource boom create opportunities for rent-seeking behavior and this can dampen economic activity due to a potentially adverse effect on entrepreneurship, especially if private rent seekers are able to appropriate the existing income from natural resources through theft, litigation and other forms of transfers. This can crowd-out entrepreneurship if the private rent seeking is more lucrative than production. Similarly, public rent seeking would also crowd-out entrepreneurship by increasing the costs of doing business. For example getting permits, licenses, tax documents, and other government supplied goods is very costly in the presence of corruption. Furthermore, Murphy et al. (1993) point out that rent seeking activity is characterized by increasing returns, which implies that high levels of rent seeking, low output and low entrepreneurship can be self-sustaining in equilibrium. While both private and public rent seeking harm entrepreneurship through their negative effect on production as described above, it is also important to keep in mind that public rent seeking additionally harms the innovative sector which tends to rely more on government supplied goods and other forms of government support as noted by Murphy et al. (1993). Hence natural resources could lead to lower innovation and consequently lower entrepreneurial activity.

Empirical studies on the relationship between natural resources and entrepreneurship are however hard to find. Existing studies on natural resources, rent seeking and entrepreneurship tend to be more theoretical (Baland and Francois, 2000; Torvick, 2002; Mehlum et al. 2006b), while the remaining empirical studies have been primarily pre-occupied with investigating the effect of rent seeking on growth. This paper contributes to empirical explanations of the resource curse by analyzing the effects of natural resource rents and institutional quality on entrepreneurship.

In the literature, entrepreneurship is often measured by the rate of self-employment, by business ownership, and by the rate of new start-ups (see Naudé 2010; Desai 2009). Following Klapper and Love (2011), we use a World Bank measure of entrepreneurship called entry density, which is defined as the number of newly registered limited liability companies (LLCs) per 1,000 working-age population. This measure is appealing because it captures a key aspect of entrepreneurship (new business creation) which, as noted by Klapper et al. (2006) and Djankov et al. (2002) plays a vital role in realizing higher firm productivity and economic growth. Earlier studies by Black and Strahan (2002) and Hause and Du Rietz (1984), among others, have also shown that entrepreneurship has a positive impact on economic growth. In addition, some studies have also shown that start-ups and young businesses contribute more to job creation than more mature firms (Ayyagari, et al., 2011; Haltiwanger et al., 2010).

The empirical evidence has also shown that the institutional environment has an impact on entrepreneurial activity. Mehlum et al. (2006a, 2006b) make a distinction between “grabber-friendly” institutions and “producer-friendly” institutions. As the name suggests, the quality of grabber-friendly institutions is poor, and they facilitate corruption, weak rule of law and other forms of bad governance which on the one hand disadvantages producers, while rewarding rent seeking behavior on the other hand, and thus divert resources away from more productive activities (Gelb, 1988; Auty, 2001; Ross, 2001). Lane and Tornell (1996) and Tornell and Lane (1999) also observe that poor quality institutions can lead to a “voracity effect,” which occurs when a government’s coercive power serves only to transfer wealth from the productive sector to favored interest groups through taxation, theft, bribes, nationalization and other rent-seeking activities, which depresses entrepreneurship by reducing the capital stock. In this study, a comprehensive measure of institutional quality is used in the analysis and it is measured along

six dimensions: voice & accountability, political stability & absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption.

A panel dataset of 28 African countries spanning the period 2002-2014 is used to empirically analyze the effects of natural resource rents and institutional quality on entrepreneurship. Panel fixed effects and dynamic panel regressions were estimated while controlling for other important factors that influence entrepreneurship. The paper finds that the estimated linear effect of resource rents on entrepreneurship is positive and statistically significant. However, the effect of the quadratic resource rents term is negative statistically significant when institutional quality is measured by government effectiveness, regulatory quality, voice & accountability, and by an average of all the six institutional indicators. Taken together these results imply that initially an increase in resource rents significantly promotes entrepreneurship up to a certain point. Thereafter, an increase in resource rents impedes entrepreneurship. Based on the results, the estimated turnaround value of natural resource rents as a percent of GDP is about 45%. The study identifies the countries in the sample where resource rents are likely to have a diminishing effect on entrepreneurship. These results therefore lend support to the hypothesis that the harm to entrepreneurship caused by rent-seeking behavior is an important channel through which the resource curse is transmitted.

Furthermore, the results also demonstrate that entrepreneurship is significantly harmed by a lack of high-quality institutions. Institutional quality is measured comprehensively using the six dimensions of institutional quality (voice and accountability, political stability and the absence of violence, government effectiveness, regulatory quality, rule of law, and the control of corruption). Superior quality institutions reward productive entrepreneurship and reduce

incentives for rent-seeking behavior. They thus divert resources toward more productive activities, thereby crowding-in entrepreneurship.

In addition to estimating the direct effect of natural resource rents on entrepreneurship, the paper also analyzes how country level-differences in institutional quality interact with natural resource rents. The results show that the estimated interaction effect is statistically significant and positively affects entrepreneurship, implying that resource rents enhance entrepreneurship in countries with superior quality of institutions. This finding has policy relevance for many African countries with a combination of weak institutions and high resource rents, including oil-rich countries like Angola, Nigeria, and Sudan; diamond rich countries like Sierra Leone, Liberia, and Congo; and countries rich in other natural resources. In some of these countries, institutions have been destroyed by civil wars over control of natural resources. In other cases where institutions have not been destroyed by conflict over resource rents, resource windfalls have nevertheless increased corruption in non-democratic regimes like Zimbabwe and other countries with badly defined property rights, low transparency, weak rule of law, and other forms of bad governance, leading to rampant rent-seeking behavior in these countries and diversion of resources away from more productive entrepreneurial activities.

The remainder of this paper proceeds as follows. Section 2 provides the empirical framework, beginning with descriptions of the data used to measure entrepreneurship, natural resource rents, institutional quality and other variables. This is followed by a discussion of country selection, descriptive measures, and the empirical specification used in the analysis. The main findings from the empirical analysis are presented and discussed in section 3, and finally, section 4 summarizes the main findings and implications of the paper.

2. Data and Methodology

The following subsections provide a detailed account of how this study is empirically implemented, including variable choice, specification of the empirical model, and data used in the analysis.

2.1. Entrepreneurship- concept and measurement

Bjørnskov and Foss (2008) make a distinction between three main concepts of entrepreneurship that have been discussed in the literature. The first and most commonly used concept, associates entrepreneurship with innovation activities which are the source of Schumpeterian forces of creative destruction such as the introduction of new products, new production processes, and new organizational modes. A second concept associates entrepreneurship with the notion of being alert to profit opportunities that may arise from arbitrage opportunities and from the discovery of new products or superior production processes, and exploiting these profit opportunities before potential competitors seize them. The third concept views an entrepreneur as someone who makes business decisions under conditions of uncertainty.

Most definitions of entrepreneurship are broadly based on at least one of these concepts. Wennekers and Thurik (1999: pg. 46-47) for example define entrepreneurship as “the manifest ability and willingness of individuals” to perceive new economic opportunities and take advantage of them under conditions of market uncertainty. Other studies adopt a similar definition (see for example, Bjørnskov and Foss, 2008, and Dreher and Gassebner, 2013).

Empirically, it is difficult to find a measure of entrepreneurship that covers all of the different dimensions discussed above. Some studies have used self-employment rates to measure entrepreneurship (see for example, Avnimelech *et al.* 2014, Dau and Cuervo-Cazurra, 2014, Bjørnskov and Foss, 2008 and 2013, Bowen and De Clercq, 2008, and Nyström, 2008). While

this measure may capture the role of an entrepreneur as a risk taker, one of its major drawbacks is that it may be correlated with the level of development. Other studies utilize survey-based responses from the Global Entrepreneurship Monitor (GEM) which provide data on respondents having the intention of starting a business, being in the process of starting a new business, or being engaged in early-stage entrepreneurial activity (see for example Dreher and Gassebner, 2013, and Bjørnskov and Foss, 2008). However, as noted by Nyström (2008), GEM data does not measure formal and informal entrepreneurship separately and it can also easily overstate the rate of entrepreneurship if some individuals who claim to be in the process of starting a business ultimately fail to do so.

In this paper, we use the World Bank measure of entrepreneurship called new business density, which is defined as the number of newly registered firms with limited liability per 1,000 working-age population (ages 15-64). This measure is appealing because it captures a key aspect of entrepreneurship discussed above and because panel data on this measure has been collected by the World Bank for a very large sample of countries. Also, it is not static or dependent on the level of development like other measures of entrepreneurship based on self-employment. In addition, it overcomes the potential problem of overstating the rate of entrepreneurship that is associated with GEM measures of entrepreneurship by excluding firms that re-register. Data on new business density is published in the World Bank's Doing Business database (www.doingbusiness.org).

However, it should also be noted that this measure has its own drawbacks. Its coverage is limited to only the formal sector. The informal sector, which is an important component of entrepreneurship in some developing countries, is excluded due to the lack of data on the number of firms operating within that sector. Within the formal sector, the focus is only on firms with

limited liability because other types of formal businesses such as partnerships and sole proprietorships differ with respect to definition and regulation, making cross-country comparisons difficult.

2.2. Natural resource rents and institutional quality

The source of data for natural resource rents is the World Bank's World Development Indicators (WDI) databank. Total natural resource rents are the sum of oil rents, natural gas rents, coal rents, mineral rents, and forest rents. Unit rents are calculated as the difference between the estimated world unit price of a commodity and the estimated average cost of producing the unit. Total rents are then determined by multiplying the physical quantities produced by the unit rents and are expressed as a percentage of GDP.

Data on the quality of institutions comes from the World Bank's Worldwide Governance Indicators (WGI) databank. The methodology used to collect the data is described in Kaufmann et al. (2010), and they define governance as "the traditions and institutions by which authority in a country is exercised" (p. 4). Based on this definition, Kaufmann et al. (2010) measure the quality of governance/institutions along six dimensions. Two of these dimensions-- voice & accountability and political stability & absence of violence--focus on the process by which governments are selected, monitored, and replaced. The next two dimensions--government effectiveness and regulatory quality--correspond to the capacity of the government to effectively formulate and implement sound policies, while the remaining two dimensions-- rule of law and control of corruption--focus on the respect of citizens and the state for the institutions that govern economic and social interactions among them. Each of the institutional indicators is measured on a scale ranging from -2.5 to 2.5, with higher values corresponding to better outcomes.

2.3. Other variables

Previous work relates entrepreneurship, and in particular business formation, to country level measures of business regulations, growth performance, and the overall economic development of a country. In the analysis that follows, these measures are therefore included as control variables. Starting with business regulations, entrepreneurship and business creation studies have been particularly interested in the regulatory environment for business start-ups. Following the previous literature (see for example Djankov et al. (2002) and the World Bank (2004)), the number of start-up procedures to register a business and time (in days) required to start a business are used as measures of business startup regulations. Data on these two measures was collected from the Doing Business website. Klapper et. al. (2006), Klapper and Love (2011), and Djankov et al. (2010) and others have shown that an increase in these measures of entry regulation has a negative and significant effect on new business creation. Some of these studies (including Klapper and Love, 2011; Klapper et.al. 2015) also control for a country's development and performance (measured by real GDP per capita and GDP growth), and find that they have a positive effect on entrepreneurship. In the empirical analysis that follows, business start-up regulations, GDP growth and real GDP per capita (from WDI databank) are therefore used as controlling variables.

2.4. Country selection and descriptive measures

Table 1 shows the total number of African countries with data on new business density in the dataset. Based on data availability, the final dataset used covers the period 2002 to 2014 and has a panel structure which is unbalanced because of missing data in a few cases. Description of variables and summary statistics of the data are shown in Table 2, and Table 3 provides a correlation matrix for the variables.

As a first pass, it is useful to examine data on entrepreneurship, resource rents and institutional quality using scatter plots. The data does not show a clear relationship between natural resource rents and new business density in Figure 1. There is however a strong positive relationship between entrepreneurship and the average of the six institutional quality indicators in Figure 2 (a). This implies that better quality institutions are associated with greater new business density. The same relationship is also observed when individual measures of institutional quality are considered separately in graphs (b) to (g) of Figure 2.

There is also a strong positive relationship between new business density and real GDP per capita in Figure 3, implying that higher levels of economic development are generally associated with greater new business activity. The relationship between new business density and GDP growth is not clear from Figure 4, and there is also no clear relationship between new business density and measures of business regulations in Figures (5a) and (5b). We should note however that scatter plots do not really tell us much about causality, and they do not take into account the effects of other variables on entrepreneurship. Therefore in order to shed more light on the nature of the relationship between natural resource rents, institutional quality and entrepreneurship, panel data regressions were estimated as explained below.

2.5. The empirical specification

To examine more precisely the impact of natural resource rents and institutional quality on entrepreneurship, fixed effects and dynamic panel data models were estimated for the sample of African countries using annual data between 2002 and 2014. The model specifications are described in the sub-sections below.

2.5.1. Fixed-effects regression

The model with fixed effects is specified as follows:

$$NewFirms_{it} = \beta_1 Rents_{it} + \beta_2 (Rents_{it})^2 + \beta_3 InstitutionalQuality_{it} + \delta' X_{it} + \alpha_i + \lambda_t + \varepsilon_{it}, \quad (1)$$

where subscripts i and t represent country and time respectively. The dependent variable (*NewFirms*) is the natural log of new business density and the focal independent variables are natural log of total natural resource rents (*Rents*) and institutional quality (*InstitutionalQuality*), which is measured by the six indicators of governance (voice & accountability, political stability & absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption) and by overall governance quality (the mean value of these six indicators).¹

In addition to these variables of main interest, the following three control variables which have been identified by the previous literature as good predictors of entrepreneurial activity at the country level are included in the vector X : the level of development (measured by real GDP per capita), business startup regulations (measured by the number of start-up procedures to register a business and days required to start a business), and economic growth as measured by GDP growth. The estimation strategy also takes into account country fixed effects (α_i) and time fixed effects (λ_t). Country fixed effects are included to control for unobserved time-invariant differences between countries that affect new business formation in the country, while time fixed effects control for unobserved time varying factors that might affect new business creation in all countries. The variable ε_{it} is the disturbance term.

¹ To verify that this is an appropriate and informationally efficient way to aggregate these underlying measures, principle component analysis (PCA) was performed to determine the variance maximizing linear combination of the governance measures. The resulting weights are very similar to the uniform weights from the simple average. Indeed, when the overall institutional quality is calculated both ways (i.e. the simple average and the weighted average according to the PCA weights), the correlation coefficient between the two series is 0.99. Therefore, overall governance/institutions is measured by way of the simple average of the underlying six governance measures.

2.5.2. Dynamic panel-data estimation

In addition to estimating equation (1) above, estimations were also performed using generalized method of moments (GMM), which is a consistent estimator for the parameters of a model in the presence of endogenous covariates. The GMM estimator is also designed for panel datasets with a shorter time dimension and a larger country dimension such as the one used in this study.

Only the fourth lag of the endogenous variables is used as instruments. Using a larger number of instruments would weaken the Sargan and Hansen tests of over-identifying restrictions (Roodman, 2009a), and in addition, using deeper lags would further reduce the sample size. It is well known that difference GMM suffers from weak instruments. Therefore the two-step system GMM is performed. However, there is still the problem that application of GMM estimators leads to instrument proliferation, which in the case of system GMM, also weakens the Hansen test of instrument validity. To limit the number of instruments generated in system GMM and avoid bias in the results, the two-step GMM is performed using collapsed instruments, following Roodman (2009b), who describes in detail how this technique can be implemented.

3. Empirical Findings

The following sub-sections present and discuss the results obtained from the fixed effects panel regression and the dynamic panel data estimation.

3.1. Fixed effects model

The results from fixed effects regressions with robust standard errors (shown in parentheses) are summarized in Table 4. In all the seven estimations, resource rents have a positive and significant effect on entrepreneurship after controlling for institutional quality (and other factors) to ensure that resource rents are not a proxy for poor quality institutions. The effect of the

quadratic resource rents term is however negative in all regressions and statistically significant when institutional quality is measured by overall governance in column (1), government effectiveness in column (3), regulatory quality in column (5), and voice & accountability in column (7). Taken together these results imply that initially, an increase in resource rents significantly promotes entrepreneurship up to a certain point. Thereafter, an increase in resource rents impedes entrepreneurship.

Therefore, there exists a range of resource rents over which entrepreneurship is increasing, and another range of resource rents over which entrepreneurship is decreasing. Focusing on the results in column (1) where the overall measure of institutional quality is significant and using equation (1), the estimated turnaround value of natural resource rents (as a percent of GDP) is about 45%. It is instructive to determine the countries in which resource rents will increase entrepreneurship and the countries where entrepreneurship will be harmed by resource rents. From Table 2, resource rents/GDP is about 14% in the average African country in the sample. As shown in Table 5, only four African countries have average resource rents figures at least equal to 45% of GDP-- Angola (45%), Equatorial Guinea (45%), Congo Rep. (50%), and Libya (51%). This therefore means that for the majority of African countries in the sample, an increase in natural resource income can actually increase entrepreneurship.

Clearly some countries benefit more from relatively large resource rent increases, while for some countries, this is not the case. There are four countries with average resource rents ratios much closer to the turnaround point-- Mauritania (32%), South Sudan (35%), Gabon (36%), and Liberia (41%). These countries should therefore be careful about the impact of very large resource rent amounts on entrepreneurship. There are 26 countries that have much lower

average resource income ratios (below 10%), while the remaining 18 countries in Table 5 have average resource rents between 10% and 30%.

The estimated coefficient on the overall measure of institutional quality is positive and statistically significant, implying that the overall quality of institutions plays an important role in facilitating entrepreneurship. All of the estimated coefficients on the various measures of institutional quality are positive as well, but only government effectiveness is statistically significant in column (3). Consistent with Mehlum et al. (2006), this implies that nations possessing strong, producer-friendly institutions attract and foster entrepreneurship. Overall, these results support Baumol (1990), Nyström (2008), and Boettke and Coyne (2009), who point out that the payoffs of entrepreneurial activities are directly related to the quality of existing institutions, and Djankov et al. (2010), who demonstrate that good institutions (measured by an index of security of property rights) have a positive effect on entrepreneurship.

Barriers to entry, as measured by the number of startup steps required of new firms, have a negative and statistically significant impact on new business formation in every model specification with the exception of the specification in column (5). This means that a regulatory environment characterized by excessive or burdensome bureaucratic procedures to register and legally operate a business increase the costs of doing business, and significantly dissuade new firm creation. Economic growth, which is a proxy for new business opportunity and economic health, is positive and statistically significant in four of the model specifications. Likewise, more economically developed nations (as measured by log per capita GDP) produce a much wider array of goods and services, have households with greater disposable income, and are likely to be more entrepreneurial. Our regression results confirm this as well (i.e., the coefficient estimates are positive and statistically significant in all model specifications).

3.2. System GMM Results

So far, the analysis has not considered whether the relation between resource rents and entrepreneurship is contingent on the quality of institutions. In the GMM estimation, institutional quality is defined as a country-level time invariant characteristic by taking the average of institutional quality indicators over the sample time period (2002-2014). The results of the two-step system GMM estimation with robust standard errors (in parentheses) in Table 6 directly test the hypothesis that resource rents enhance entrepreneurship through the institutional quality channel. Because country fixed effects are included, the time invariant average of institutional quality measures is not included separately in the estimations.

Implementing the collapsing technique reduces the instrument count from 20 to 6, and both the Sargan and Hansen tests support the null hypothesis that the over-identifying restrictions are valid after reducing the instrument count. With collapsed instruments, the linear effect of resource rents is positive as before and it is also statistically significant except in column (6). More importantly, the interaction term is positive and statistically significant in all the estimations. Therefore, higher natural resource income is beneficial to entrepreneurship and new business formation in nations with high quality institutions. This result holds using an average of all six governance indicators in column (1) and an average of each governance indicator separately in the remaining columns.

The result of a negative relationship between business start-up regulations (procedures to register a business) and entrepreneurship can be observed in all the estimations, although it does not pass conventional tests of statistical significance. An increase in GDP growth has a positive effect on entrepreneurship in line with prior expectations, however this result is statistically significant only in the estimations reported in columns (4) and (6).

4. Summary and Conclusions

A panel dataset of 28 African countries spanning the period 2002-2014 is used to empirically analyze the effects of natural resource rents and institutional quality on new business density, a salient feature of the entrepreneurial process. The paper finds that resource rents have a significant diminishing effect on entrepreneurship. Based on the results, the estimated turnaround value of natural resource rents as a percent of GDP is about 45%. The study identifies the countries in the sample where resource rents have a crowding-in effect on entrepreneurship and countries where there is no crowding-in effect. These findings are consistent with the hypothesis that the harm to entrepreneurship caused by rent-seeking behavior is an important channel through which the resource curse is transmitted.

The results also demonstrate that entrepreneurship is significantly harmed by a lack of high-quality institutions which reward productive entrepreneurship and reduce incentives for rent-seeking behavior. Finally, the paper also finds evidence in support of the hypothesis that resource rents enhance entrepreneurship in countries with superior quality of institutions. This finding has policy relevance for many African countries with a combination of weak institutions and high resource rents. The study and its findings contributes to empirical explanations of the resource curse.

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Table 1: List of 28 African Countries in the Sample with Data on New Business Density

Country	Code	Income Group
Algeria	DZA	Upper middle income
Botswana	BWA	Upper middle income
Burkina Faso	BFA	Low income
Congo, Dem. Rep.	ZAR	Low income
Egypt, Arab Rep.	EGY	Lower middle income
Ethiopia	ETH	Low income
Gabon	GAB	Upper middle income
Ghana	GHA	Lower middle income
Guinea	GIN	Low income
Kenya	KEN	Lower middle income
Lesotho	LSO	Lower middle income
Madagascar	MDG	Low income
Malawi	MWI	Low income
Mauritius	MUS	Upper middle income
Morocco	MAR	Lower middle income
Namibia	NAM	Upper middle income
Niger	NER	Low income
Nigeria	NGA	Lower middle income
Rwanda	RWA	Low income
Sao Tome and Principe	STP	Lower middle income
Senegal	SEN	Low income
Sierra Leone	SLE	Low income
South Africa	ZAF	Upper middle income
South Sudan	SSD	Low income
Togo	TGO	Low income
Tunisia	TUN	Lower middle income
Uganda	UGA	Low income
Zambia	ZMB	Lower middle income

Table 2: Definitions and Summary Statistics

Variable	Obs.	Description	Mean	Standard Deviation	Min	Max
New business density	271	New firm registrations per 1,000 people ages 15-64)	1.38	2.33	0.00	13.11
Resource rents	761	Total natural resources rents (% of GDP)	14.07	14.49	0.00	89.17
Governance	769	Average of six governance indicators (control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability)	-0.62	0.58	-2.23	0.87
Control of corruption	770	The extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests	-0.58	0.57	-1.90	1.25
Government effectiveness	769	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies	-0.70	0.60	-2.09	1.04
Political stability	769	Measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism	-0.51	0.89	-2.99	1.19
Regulatory quality	769	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development	-0.65	0.58	-2.41	1.12
Rule of law	769	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence	-0.66	0.61	-2.21	1.06
Voice & accountability	769	Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media	-0.64	0.71	-2.18	1.02
GDP per capita	766	GDP per capita (constant 2010 US\$)	2328.32	3191.70	193.87	20333.94
Start-up procedures	581	Start-up procedures to register a business (number)	9.78	2.98	3.00	18.00
Start-up time	581	Time required to start a business (days)	43.16	40.57	4.50	260.50
GDP growth	764	Annual percentage growth rate of GDP	2.20	5.83	-62.23	56.88

Table 3: Correlation Matrix

	New business density	Resource rents	Governance	Control of corruption	Govt effectiveness	Political stability	Regulatory quality	Rule of law	Voice & accountability	GDP per capita	Startup proced ures	Start- up time	GDP growth
New business density	1.00												
Resource rents	-0.26	1.00											
Governance	0.64	-0.66	1.00										
Control of corruption	0.61	-0.61	0.91	1.00									
Govt effectiveness	0.56	-0.62	0.91	0.88	1.00								
Political stability	0.53	-0.55	0.86	0.74	0.63	1.00							
Regulatory quality	0.60	-0.60	0.92	0.81	0.90	0.68	1.00						
Rule of law	0.63	-0.64	0.95	0.87	0.92	0.78	0.89	1.00					
Voice & accountability	0.53	-0.54	0.81	0.63	0.62	0.68	0.70	0.68	1.00				
GDP per capita	0.68	-0.14	0.63	0.56	0.66	0.46	0.63	0.62	0.47	1.00			
Startup procedures	-0.15	0.22	-0.29	-0.25	-0.16	-0.39	-0.22	-0.22	-0.23	-0.11	1.00		
Startup time	0.12	0.01	0.13	0.13	0.02	0.17	0.04	0.07	0.21	0.17	0.33	1.00	
GDP growth	0.01	0.01	0.09	0.12	0.14	0.01	0.09	0.10	0.07	-0.04	-0.06	-0.01	1.00

Table 4: Fixed Effects Panel Regression Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Institutional quality measure:	Governance	Control of corruption	Government effectiveness	Political stability	Regulatory quality	Rule of law	Voice & accountability
Resource rents	0.199** (0.072)	0.175** (0.069)	0.192** (0.072)	0.146* (0.075)	0.169** (0.065)	0.178** (0.070)	0.144* (0.072)
Resource rents squared	-0.026* (0.014)	-0.021 (0.014)	-0.031** (0.015)	-0.027 (0.016)	-0.030* (0.017)	-0.022 (0.015)	-0.030* (0.015)
Institutional quality	1.369** (0.646)	0.578 (0.388)	0.840* (0.434)	0.250 (0.213)	0.394 (0.381)	0.825 (0.539)	0.499 (0.319)
Log GDP per capita lagged	1.629*** (0.554)	1.859*** (0.526)	1.971*** (0.613)	2.147*** (0.664)	2.002*** (0.558)	1.820*** (0.563)	2.150*** (0.771)
Start-up procedures	-0.106* (0.055)	-0.106* (0.058)	-0.104* (0.054)	-0.104* (0.059)	-0.098 (0.060)	-0.109* (0.058)	-0.107* (0.057)
GDP growth	0.010 (0.006)	0.010* (0.006)	0.011 (0.007)	0.015* (0.008)	0.012* (0.007)	0.012* (0.006)	0.014 (0.009)
Constant	-11.317** (4.395)	-13.269*** (4.114)	-13.935*** (4.654)	-15.416*** (4.961)	-14.385*** (4.203)	-12.855*** (4.366)	-15.283** (5.747)
R-squared	0.508	0.483	0.493	0.462	0.462	0.481	0.470
Number of countries	28	28	28	28	28	28	28
Observations	243	243	243	243	243	243	243

Robust standard errors in parentheses

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

Table 5: Average Resource Rents (% GDP) for African Countries

Country	Average Resource Rents (% GDP)	Country	Average Resource Rents (% GDP)
Libya	51	Mozambique	9
Congo, Rep.	50	Mali	9
Equatorial Guinea	45	Cameroon	9
Angola	45	Malawi	8
Liberia	41	Rwanda	7
Gabon	36	Madagascar	7
South Sudan	35	Tanzania	7
Mauritania	32	South Africa	6
Congo, Dem. Rep.	29	Cote d'Ivoire	6
Chad	25	Tunisia	5
Burundi	25	Eritrea	5
Nigeria	23	Gambia, The	5
Guinea	22	Benin	5
Algeria	20	Botswana	4
Ethiopia	20	Lesotho	4
Guinea-Bissau	15	Senegal	4
Zambia	15	Kenya	4
Sierra Leone	14	Sao Tome and Principe	3
Togo	14	Swaziland	3
Uganda	14	Comoros	3
Ghana	13	Morocco	2
Sudan	13	Namibia	2
Burkina Faso	11	Djibouti	1
Niger	11	Cabo Verde	1
Central African Republic	10	Seychelles	0
Egypt, Arab Rep.	10	Mauritius	0

Table 6: Dynamic Panel Data Estimation, Two-Step GMM

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Governance	Control of corruption	Government effectiveness	Political stability	Regulatory quality	Voice & accountability	Rule of law
New business density lagged	1.035*** (0.052)	1.034*** (0.051)	1.038*** (0.050)	1.034*** (0.052)	1.037*** (0.051)	1.035*** (0.051)	1.036*** (0.051)
Resource rents	0.015** (0.007)	0.017* (0.009)	0.014* (0.007)	0.009** (0.004)	0.014** (0.006)	0.013 (0.008)	0.013** (0.006)
Resource rents*Institutional quality (mean)	0.011* (0.006)	0.014* (0.007)	0.009* (0.005)	0.005* (0.003)	0.011* (0.006)	0.009* (0.005)	0.010* (0.005)
Start-up procedures	-0.007 (0.007)	-0.008 (0.008)	-0.008 (0.008)	-0.004 (0.007)	-0.007 (0.007)	-0.006 (0.007)	-0.007 (0.007)
GDP growth lagged	0.009 (0.006)	0.009 (0.005)	0.009 (0.006)	0.010* (0.006)	0.009 (0.006)	0.009* (0.005)	0.010 (0.006)
Number of instruments	6	6	6	6	6	6	6
Arellano-Bond test for AR (2) in first differences	-1.060	-1.050	-1.060	-1.060	-1.060	-1.060	-1.060
<i>P value</i>	0.291	0.293	0.289	0.290	0.290	0.290	0.290
Sargan test of overid. restrictions	1.160	1.150	1.090	1.170	1.150	1.080	1.130
<i>P value</i>	0.281	0.283	0.296	0.280	0.284	0.299	0.288
Hansen test of overid. restrictions	0.280	0.280	0.270	0.280	0.280	0.270	0.280
<i>P value</i>	0.595	0.600	0.600	0.594	0.595	0.605	0.598
Observations	231	231	231	231	231	231	231
Number of countries	28	28	28	28	28	28	28

Robust standard errors in parentheses

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

Figure 1: New Business Density vs. Natural Resource Rents

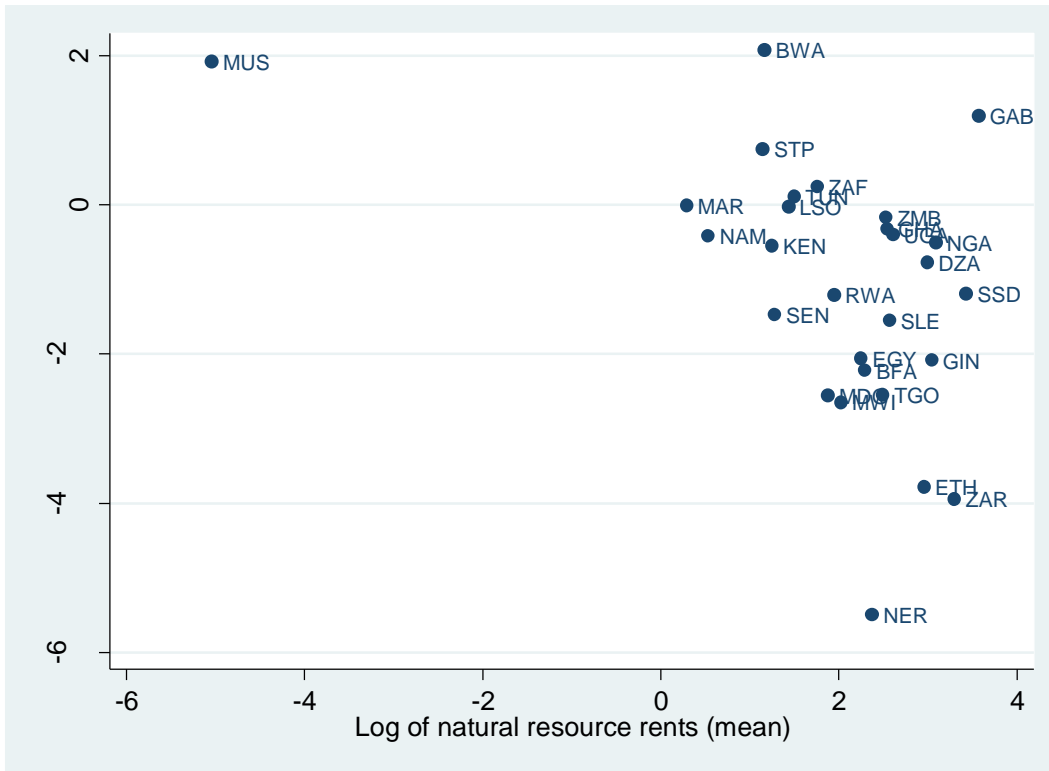
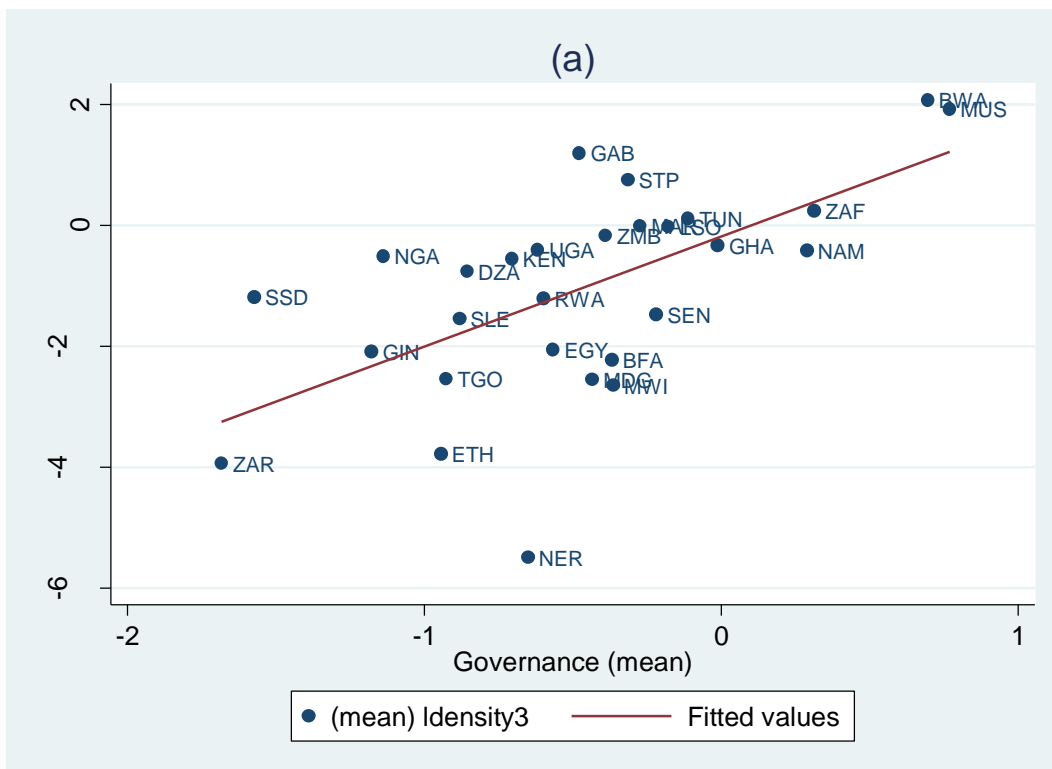
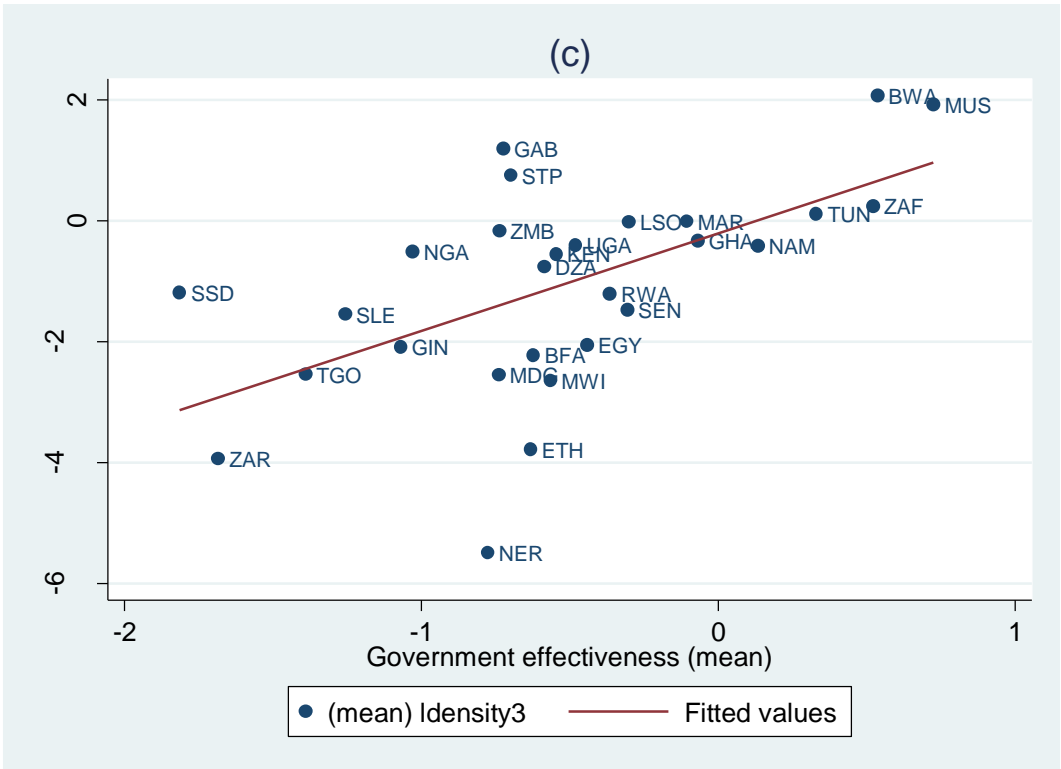
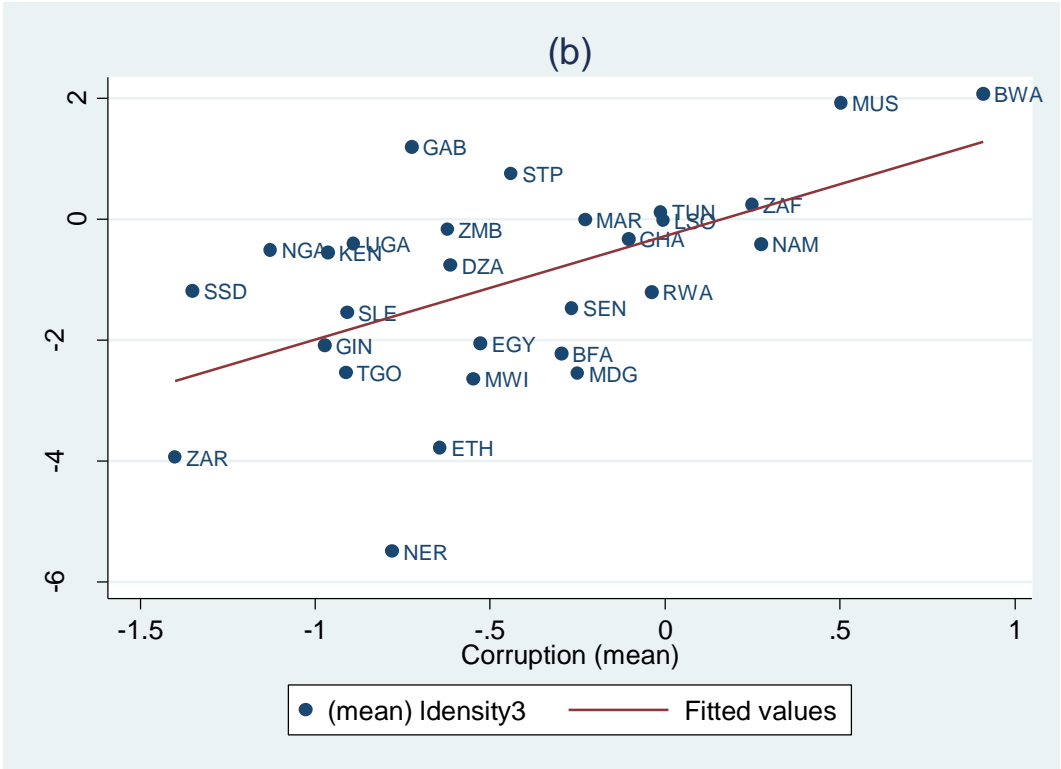
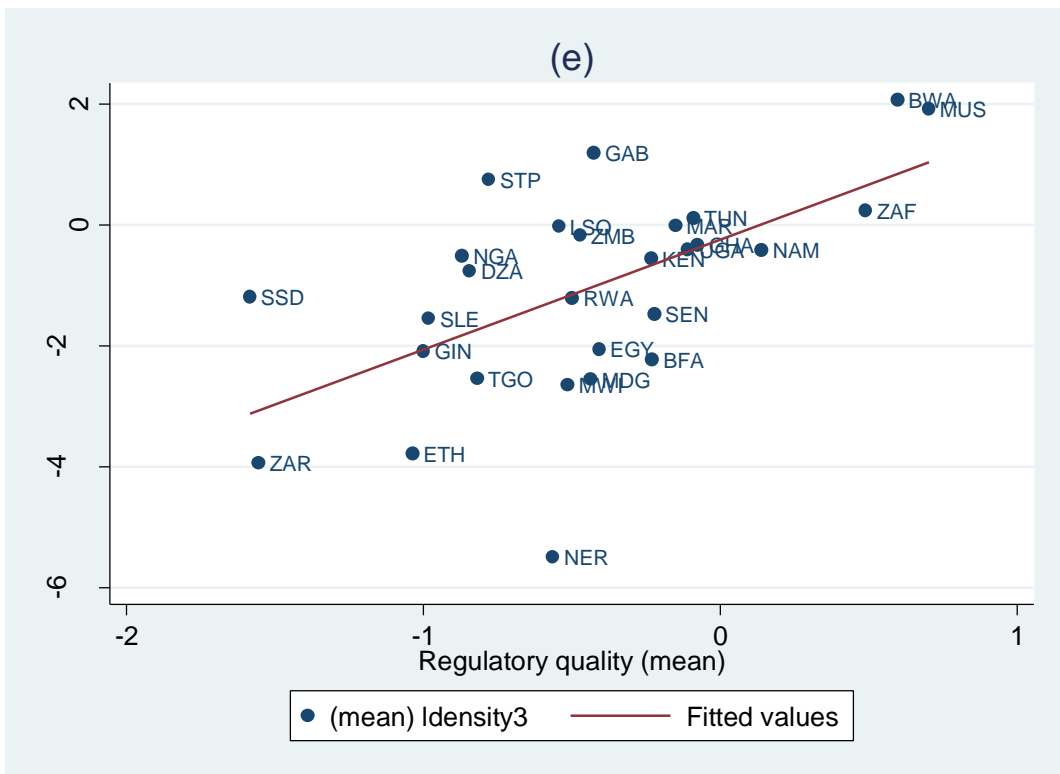
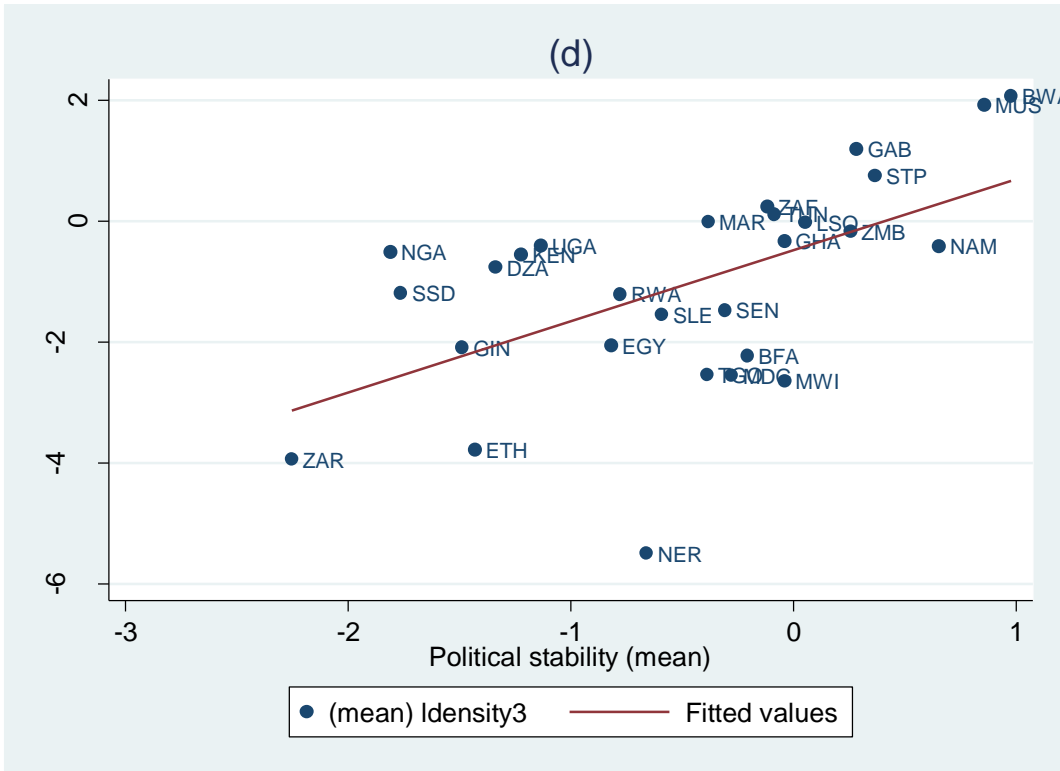


Figure 2: New Business Density vs. Governance/Institutions







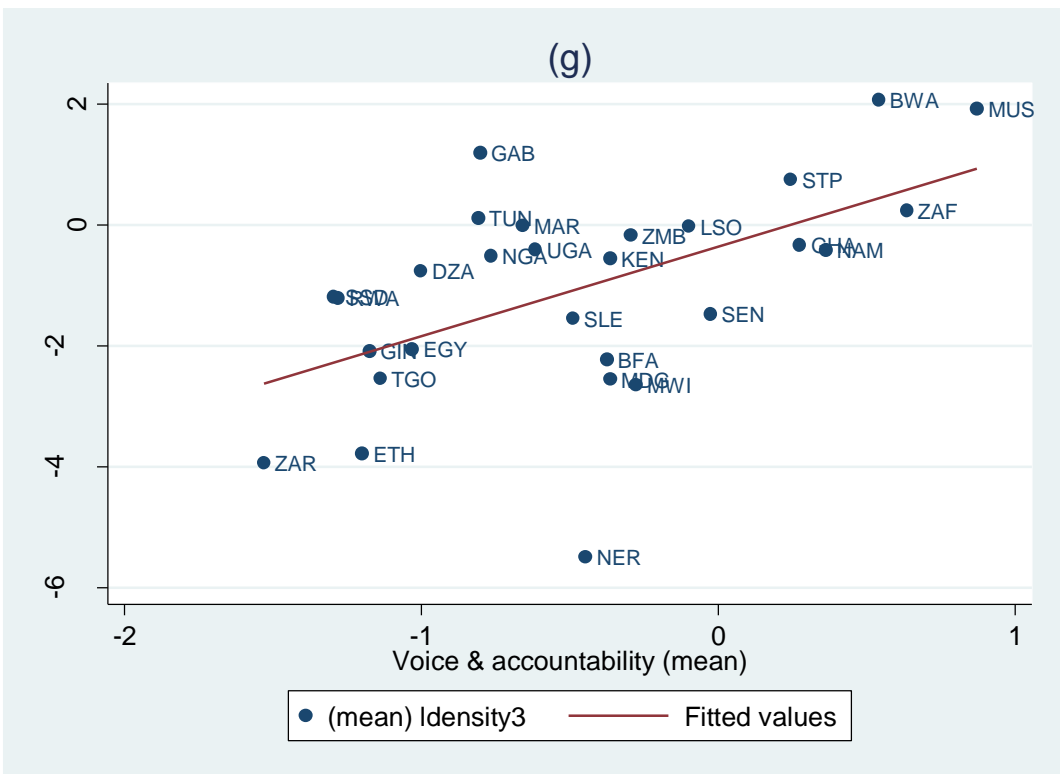


Figure 3: New Business Density vs. Real GDP per Capita

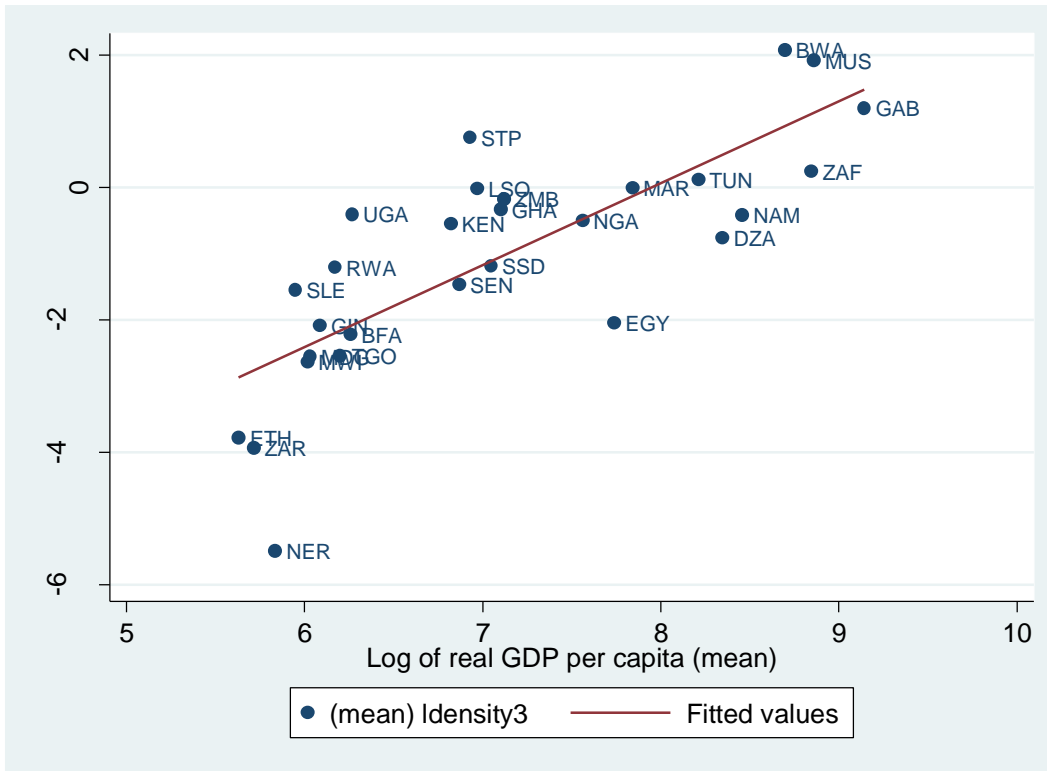


Figure 4: New Business Density vs. GDP Growth

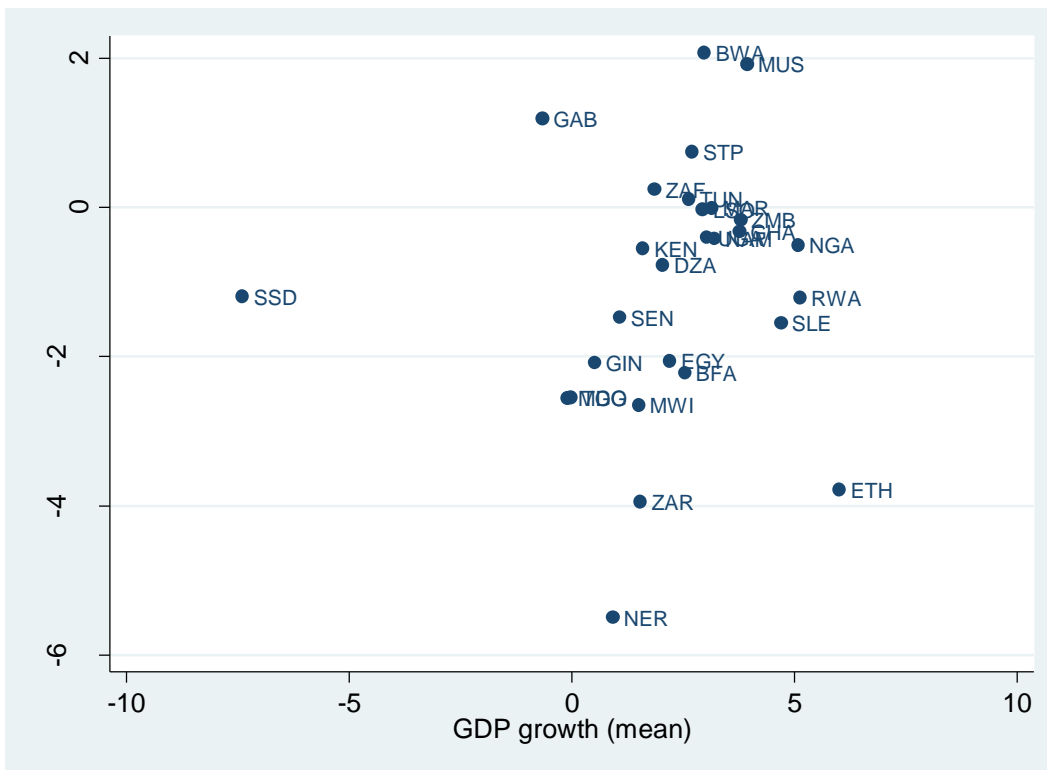


Figure 5: New Business Density vs. Business Startup Regulation

