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The business environment and economic development

How the ease of doing business in sub-Saharan Africa relates to its economic growth

Jackline Kokujaliwa Muhanika

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Corresponding author: jackiemuhanika@gmail.com

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Abstract: This paper investigates the business environment in sub-Saharan Africa. Previous studies show that the ease of doing business is associated with economic growth as it affects the level of business. This study aims to examine whether the ease of doing business performance is related to economic growth in sub-Saharan Africa and whether certain ease of doing business indicators are particularly important. Using panel data for 44 countries from 2006–16 and fixed effects analysis, I find mixed effects on gross domestic product for the different ease of doing business indicators. However, principal component analysis reveals that the combined ease of doing business index is positively related to a country's gross domestic product. Similar results are obtained when the sample is classified by income and democracy levels. It is therefore important for sub-Saharan African countries to make efforts to create a conducive business environment as this will promote business prosperity and economic development.

Key words: business environment; ease of doing business indicators; economic growth

JEL classification: O1; O2

1 Introduction

The role of businesses, particularly small and medium-sized enterprises (SMEs), has become increasingly important in sub-Saharan Africa (SSA) over the past decade. In a report by the World Economic Forum, it is estimated that small and growing businesses constitute about 80 per cent of the region's employment and significantly promote trade in goods and services (Dos Santos 2015).

Despite the high level of business activities, a large proportion of the businesses are typically small and informal, which limits their income and contribution to the economy. Amongst other factors, this situation is attributed to difficulties in doing business, such as access to finance and electricity in the region (Thompson et al. 2017). Previous studies suggest that there is a positive relationship between the ease of doing business and economic growth (Djakov et al. 2006; Jayasuriya 2011). This paper therefore discusses the ease of doing business in SSA with a focus on how improving the business environment in the region can promote both business and economic development.

My research questions are as follows:

- Is there a correlation between the ease of doing business indicators and economic growth in SSA? This question seeks to get an understanding of whether progress in the business environment is associated with growth.
- Are there specific ease of doing business indicators that are more effective in promoting business and economic growth? This question may assist in identifying the driving factors for ease of doing business which may be of benefit to policy makers.
- Can an aggregate index provide a better explanation of the effects of ease of doing business on economic growth? To the best of my knowledge, there is limited empirical evidence in the reviewed literature which makes use of aggregated ease of doing business.

To answer these questions, I conduct a panel data analysis for 44 SSA countries over a period of 11 years (2006–16). The initial results do not provide a conclusive answer on the correlation with economic growth. However, the results become more conclusive when I aggregate the ease of doing business index using principal component analysis (PCA). The results from the index are positively correlated with economic growth, suggesting that the business indicators are interrelated and need to be considered together to promote growth. An in-depth understanding of the correlation identified in this study would be useful for determining the policies and reforms that should be prioritized for promoting business and economic growth.

This paper consists of six sections. The next section looks at the profile of the SSA region and its ease of doing business performance. This is followed by the literature review. The fourth section is the methodology, which discusses the data and the model used. The fifth section presents the results of the regression and the group analysis of countries. Finally, the paper concludes and provides recommendations based on the results.

2 Profile of ease of doing business in sub-Saharan Africa

The SSA region is one of the fastest-growing regions in the world. In the predictions for the most-growing cities to 2020, nine out of 20 are from SSA (Thompson et al. 2017). The region also has the fastest-growing population, with over 1 billion people currently and expected to increase to

2 billion by 2050. Economically, the region has experienced significant growth rates with several of its economies growing at around 5 per cent in the past decade. Countries such as Rwanda, Côte d'Ivoire, and Ethiopia have had growth rates of over 7 per cent in the last five years. These fairly high growth rates make the region a viable area for both local and international business investment.

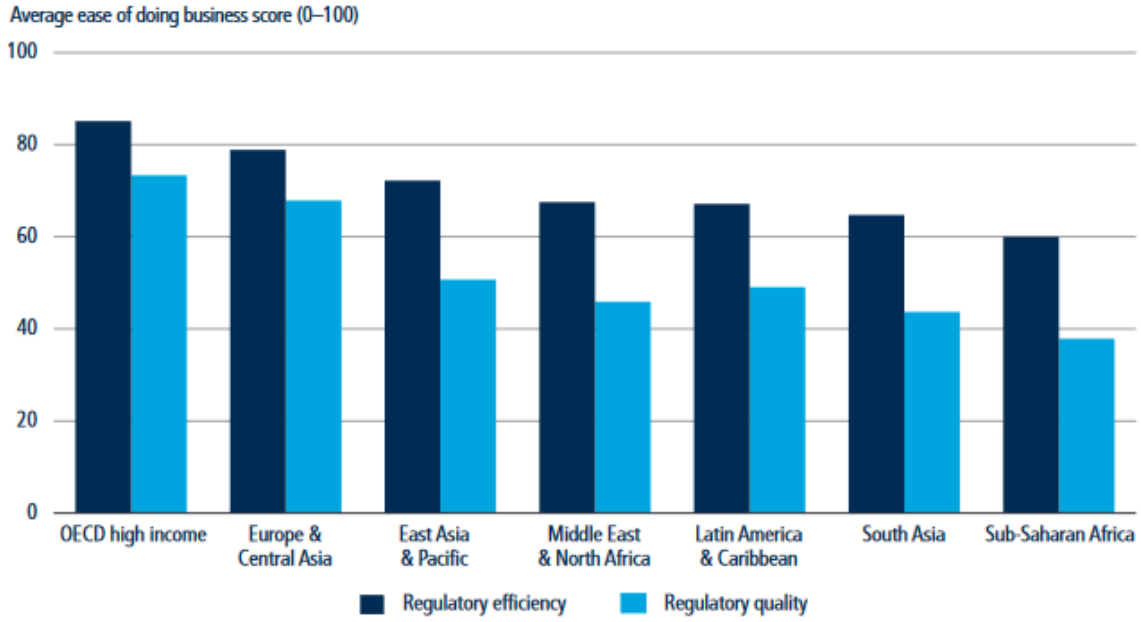
The level of business activity in any country is highly influenced by the business environment. The World Bank assesses the business environment for countries through its ease of doing business indices. The doing business indicators include starting a business, dealing with construction permits, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, getting electricity, and resolving insolvency. These indices determine how easy it is to start and operate a business as they are based on the time and costs involved. Using these indicators, the World Bank measures and ranks countries' performance according to ease of doing business.

Ease of doing business is presented in two forms: the doing business score and the doing business ranking. The score shows the regulatory performance level for each doing business indicator in absolute terms, while the rank shows a country's performance relative to other countries (World Bank 2019). A high ease of doing business performance means that it is easy to conduct business in a country.

The scores and rankings are based on the doing business indicators where the performance varies and poor performance in some indicators has a significant effect. For instance, the World Bank (2017) report highlights that SSA still underperforms in the registration of property. According to the report, it takes about 60 days to transfer property in the region compared to 22 days in OECD high-income countries. The long process in the registration of property contributes to longer waiting times before one can start to operate a business, and this limits earnings. Similarly, the availability of credit has been reported to play a crucial role in SSA and the lack of it has been listed as a setback for businesses. In their survey, Thompson et al. (2017) find that access to finance is a common problem mentioned by small and medium enterprises (SMEs).

According to the World Bank (2019) report, the SSA countries' ease of doing business performance is unsatisfactory and low compared to other world regions as observed from both the scores and rankings. The scores are measured on a scale from 1 to 100, i.e. from the lowest to the highest. Most SSA countries score below 50. Figure 1 shows the ease of doing business scores. The OECD high-income countries generally have the highest score, while SSA has the lowest.

Figure 1: Ease of doing business across world regions

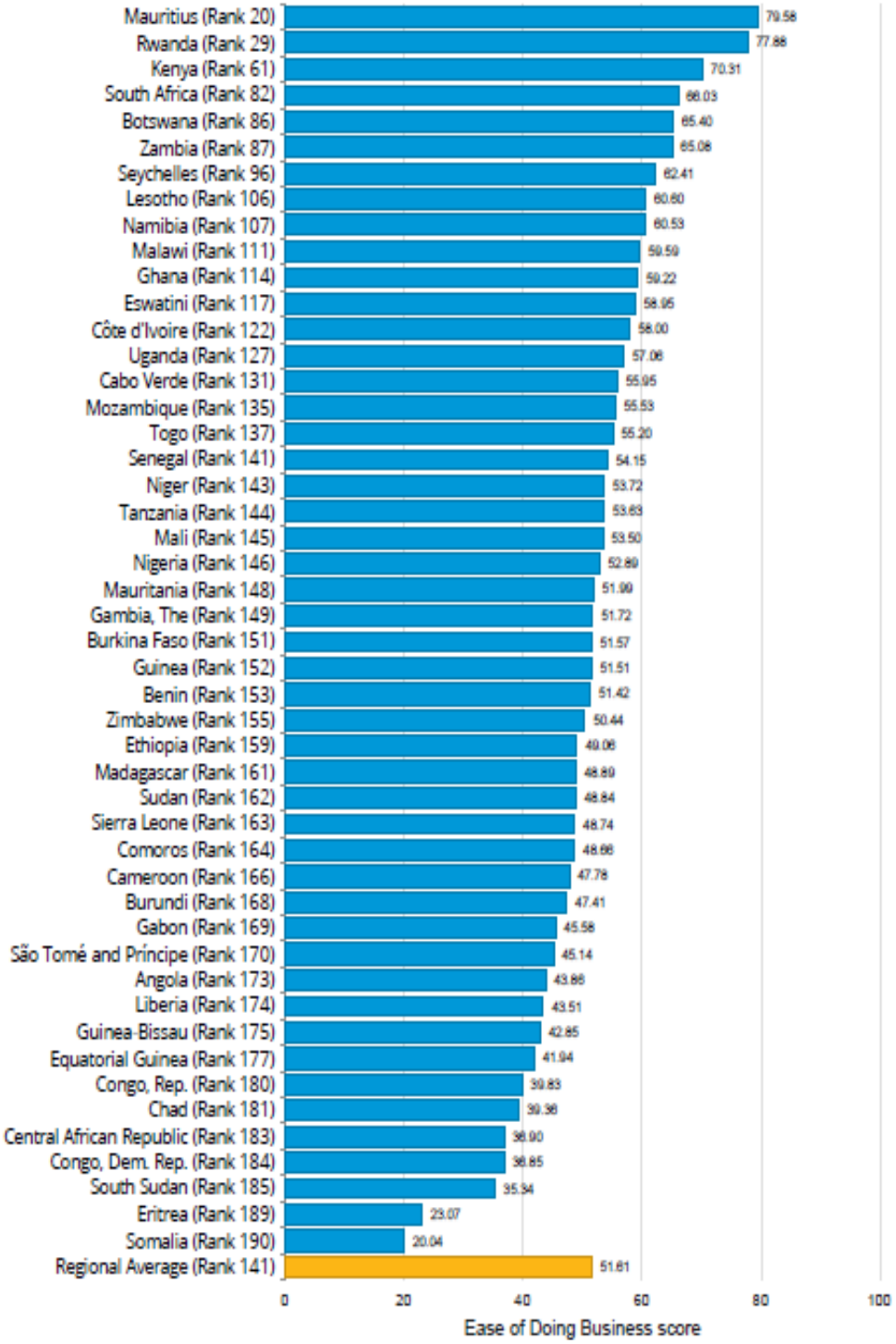


Source: Figure 1.2 in World Bank (2019a: 6). Licensed under Creative Commons 3.0 IGO.

In terms of rankings, the World Bank ranks 190 countries, assigning 1 to the most business-friendly country and 190 to the least business-friendly country. The majority of SSA countries have poor rankings and are placed over the 100th position, with seven of its countries in the bottom 10 and a regional average ranking of 141.

Nevertheless, some countries in the region such as Mauritius, which joined the top 20 countries in 2018, have a good ranking. Other high rankings in SSA include Rwanda (29), Kenya (61), and South Africa (82). The lowest rankings in the region include the Democratic Republic of Congo (184), South Sudan (185), and Eritrea (189). Figure 2 shows the ease of doing business scores and rankings for SSA countries.

Figure 2: Ease of doing business rankings of African countries



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Despite its poor performance in ease of doing business, overall, the region has implemented the highest number of reforms in the past six years. Most notably, there have been more improvements in enforcing contracts, starting a business, and registering property. Of the top ten global improvers, four countries are in SSA—Rwanda, Togo, Côte d'Ivoire, and Kenya. These efforts by SSA countries to reform their business policies provide confidence for the development of a business-friendly environment that will steer business and economic growth.

3 Literature review

In SSA, SMEs have been regarded as a driver of economic growth due to their contribution to job creation, market expansion, promotion of entrepreneurship, and capital formation. The SMEs in various sectors, such as agriculture, manufacturing, and service industries, feed into the big industries. Additionally, SMEs contribute to the creation and testing of ideas and innovations, as some products are introduced on a small scale before they enter large markets. Overall, SMEs play a significant role in the creation of income and employment (Muriithi 2017).

In their study, Ayyagari et al. (2003) state that the contribution of SMEs appears to be strongly correlated with a country's gross domestic product (GDP). However, the correlation is not as apparent in developing countries as it is in developed countries. In Africa, this is attributed to the large presence of informal sectors. Thompson et al. (2017) give the example of Zambia, where the informal sector employs about 85 per cent of the labour force. This informality impedes businesses from being recognized and contributing effectively to the national income. To increase the level of the formal sector in SSA, there needs to be a deliberate effort to create a business-friendly environment which will encourage formal set-ups.

The literature confirms the importance of ease of doing business for business development and economic growth. Studies by Djakov et al. (2006), Jayasuriya (2011), and Klapper et al. (2004) find that the ease of doing business is related to a country's growth trends. Gillanders and Whelan (2014) state that recent doing business rankings have had explanatory power for economic growth in every decade over the past four decades. According to Djakov et al. (2006), when trying to explain variation in GDP, it is important to consider the ease of doing business factor, as they find that a good ease of doing business score has a positive effect on growth. The business environment is associated with economic growth through its influence on the nature and level of business activity in the country.

Klapper et al. (2004) find that the business environment influences a new firm's entry level and overall productivity. Entry regulations seem to reduce entry even in industries that typically have many firms. Barriers to entry such as high registration costs have negative effects on productivity and business quality. This is caused by a lack of competition for incumbent firms, which can lead to inefficiency. This is also confirmed by Viviano (2008) who finds that barriers to entry harm the efficiency of small firms and employment growth in the Italian retail sector.

Most importantly, the ease of doing business performance signals a country's investment climate. High doing business scores and rankings make a country attractive to investors as they feel reassured that they will be able to run their business there smoothly. Additionally, they enable investors to assess the suitability of certain businesses, which will ultimately determine the nature and size of investment in the country. Intra-regional business development, for instance, will be influenced by the ease of trade across borders.

Green et al. (2010) state that investments in developing countries, either domestic or foreign direct investment (FDI), have a positive effect on a country's growth. Furthermore, it is more useful and profitable to channel resources towards private investments than public ones. However, investment in Africa, especially FDI, is quite low. With about 15 per cent of the world's population, Africa only received about 4.4 per cent of total FDI in 2015 (Thompson et al. 2017). This lag in FDI investment prevents African countries from reaching higher growth levels. To improve investment figures, countries must create a conducive business environment by implementing business-friendly policies and strengthening institutions.

Institutions and governments are an integral part of the proper functioning of any economy. The study by Hall and Jones (1999) attests to the significant role of institutions in fostering wealth creation and long-term growth. Moreover, there is a growing census on the contribution that business regulation and institutions make to a country's prosperity (Haidar 2012). Haidar (2012) gives the examples of Hong Kong, Botswana, and Hungary, whose increased growth has been steered by good business regulations. Djakov et al. (2006) present data on regulations for business entry in 85 countries and find that stronger regulations are associated with high levels of corruption. On the other hand, democratic countries with limited governments tend to have weaker regulations.

A survey conducted by Thompson et al. (2017) on Uganda, Tanzania, Zambia, and Nigeria shows that government policies and politics are a problem for businesses in African countries. They observe that pro-business policies appear to be superficial as the actual politics still pose difficulties (Thompson et al. 2017). Based on the interviews they conducted, businesses tend to avoid contact with the state due to fear of corruption and delays. In addition to this, young entrepreneurs struggle to find a place in the market in the presence of dominant businesses with high capital and political connections. As a result, most end up in the informal sector. The presence of a large informal sector does not contribute significantly to government revenue, which in turn reduces the government's ability to support business, thereby creating a vicious cycle (Thompson et al. 2017).

To create a conducive business environment and achieve higher growth, the government needs to promote good governance which will curb corruption, strengthen institutions, and implement reforms to improve the ease of doing business. Rodrik and Subramanian (2004) assert this using the example of India, whose adoption of pro-business policies contributed to its transition to high growth.

According to Haidar (2012), countries that have more business reforms tend to have higher growth. However, to make their reforms effective, countries need to be aware of the specific and general areas for improvement. While Jayasuriya (2011) advocates that addressing specific doing business indicators is vital, Blanchet (2006) states that the aggregate ranking is more significant than the ranking of individual indicators. In this paper, I consider both the disaggregated and aggregated components of the ease of doing business.

4 Methodology

4.1 Data

The study is a panel dataset of 44 SSA countries, observed over 11 years from 2006 to 2016. The main explanatory variables are ease of doing business indicators. The World Bank has two kinds of indices for ease of doing business: the doing business rankings and scores, the latter of which is also known as the distance to frontier score (DTF). The DTF score is measured on a scale from 0 to 100, showing the regulatory level and performance for each indicator. Scores approaching 0 represent low performance, while scores close to 100 (the frontier) represent high performance. The DTF method enables observation of absolute improvement or the performance trend of an economy, unlike the ranking method, which shows improvement in the position of one economy relative to another (Adepoju 2017). For this reason, this study uses DTF scores to capture the ease of doing business indicator levels.

The World Bank identifies ten ease of doing business indicators based on the DTF scores. These indicators are all included in this study, except for the getting electricity indicator due to insufficient

data. The methodology for obtaining the scores for the indicators involves observation of the procedure, cost, and time spent in formally meeting requirements and operating a business.

The study also includes four control variables. These are capital, population, primary school enrolment, and democracy. The data for these were also obtained from the World Bank, while democracy (polity2) was obtained from the Polity IV project compiled by the Center for Systemic Peace (2019). Polity2 is an institutional variable which measures the level of democracy on a scale from -10 to 10, i.e. from hereditary monarchy to consolidated democracy. Thus, the higher the polity2 score, the more democratic the nation is.

The dependent variable used in the study is GDP per capita (constant 2010 USD) obtained from the World Bank.

The description of the indicators and all the variables used in the study are given in Table 1.

Table 1: Description of the variables

Variable name	Indicator	Description
Start business	Starting business	Procedure, time, cost and paid-in minimum capital limited liability company
Permit	Dealing with construction permits	Procedure, time and cost to complete all formalities for construction permitting system
Register property	Registering property	Procedure, time and cost to transfer a property and the quality of the land administration system
Get credit	Getting credit	Movable collateral laws and credit information systems
Protect investors	Protecting minority investors	Minority shareholders' rights in related-party transactions and in corporate governance
Pay tax	Paying taxes	Payment, time and total tax rate for a firm to comply with all tax regulations and post-filing processes
Border trade	Trading across borders	Time and cost to export the product of comparative advantage and import auto parts
Enforce contract	Enforcing contracts	Time and cost to resolve a commercial dispute and the quality of judicial processes
Resolve insolvency	Resolving insolvency	Time, cost, outcome and recovery rate for commercial insolvency and the strength of the legal framework for insolvency
GDP per capita	Gross domestic product per capita	Total market value of all final goods and services produced by a country in a certain period of time per each individual in the country at constant 2010 USD prices
Capital	Gross capital formation	Gross capital formation measured at constant 2010 USD prices
Prim enrolment	Primary school enrolment	The ratio of total primary enrolment to the population group
Population	Population	Total number of people in a country
Polity2	Polity 2	Institutional variable that measures the level of democracy

Source: author's elaboration partially based on Table 2.1 in World Bank (2018: 12), which is licensed under Creative Commons 3.0 IGO.

4.2 Expectations

In this study, I expect to see positive coefficients, indicating a positive correlation between the doing business indicators and GDP per capita. This would mean that a higher score for business indicators and progress towards a business-friendly environment is associated with increased

income. This makes economic sense as easy procedures and lower costs for doing business would encourage business and ultimately boost a county's level of production. A high score for doing business indicators would create confidence amongst investors, thereby encouraging investment and income.

A negative coefficient, on the other hand, would be inconsistent with economic expectations. However, this outcome is also possible in cases of inefficiencies related to procedures, lobbying, and corruption or for other reasons which could adversely affect efforts to develop business.

Similarly, for the control variables, the a priori expectations are positive coefficients. Capital and primary school enrolment are forms of investment which improve the ability to produce and earn income. Strong institutions create a better working environment and ensure the proper functioning of the systems in place, thereby encouraging production. Lastly, population can be expected to be positive in accordance with Solow's 1956 growth model, as it is an important resource for production (Schiliro 2017). However, this may depend on the type of labour, as demonstrated by Romer's 1986 model, which shows that it is an educated population that contributes to growth (Fedderke 2002). The presence of a large number of uneducated and unemployed people will result in a lower GDP per capita.

4.3 Empirical specification

Given the structure of the dataset (cross-country and time series), this study uses panel data analysis, namely pooled ordinary least squares (OLS) and fixed effects.

The theoretical framework for this model is based on the Solow (1956) growth model (Schiliro 2017). The growth function consists of several components, with ease of doing business as the main component and other additional variables. Like the Solow model, this model accounts for capital and population in explaining countries' economic growth.

The econometric model used in this study is:

$$ln\, y_{\,it} = \alpha_i + \beta_i lnX_{i,t-1} + \delta_i lnC_{i,t-1} + \mu_i lny_{i,t-1} + \varepsilon_{it}$$

where y represents the dependent variable (GDP per capita), X represents the independent variables (ease of doing business indicators), C represents the control variables, and i and t are indices for country and time effects. The parameter α represents the constant and ε represents the error term. β and δ are coefficients of variables and μ is the coefficient for the lagged log GDP. All variables are logged except for polity2, whose scores range from negative to positive.

This study uses a dynamic model as it includes lagged GDP per capita to account for persistence in GDP per capita. The other variables are also lagged to allow for delays in per capita income to changes in the determinants, and to help to minimize endogeneity issues such as reverse causality.

A Hausman test is conducted to determine the appropriate panel technique. The p-value is 0.461, which means we reject the null hypothesis that random effects are preferred. In this case, fixed effects are preferred. For comparison purposes, robust OLS analysis is included, but interpretation is based on the fixed effects model. The fixed effects model removes individual effects and ensures that the correlation between effects and error terms does not result in slope bias. It is also the most suitable model for this study as it keeps the values of the independent variables constant and enables observation of only the changes in the dependent variable.

The overall analysis in this paper involves estimations for the whole SSA region as well as for countries grouped by income and democracy level.

4.4 Descriptive statistics

Table 2 shows pairwise correlations between the explanatory variables and GDP per capita. The doing business indicators are all positively correlated with GDP per capita. This is in line with economic expectations as improvement in the process of starting and operating a business contributes to an increase in the number of businesses and income. Summary statistics can be found in the Appendix (Table A2).

Table 2: Pairwise correlations

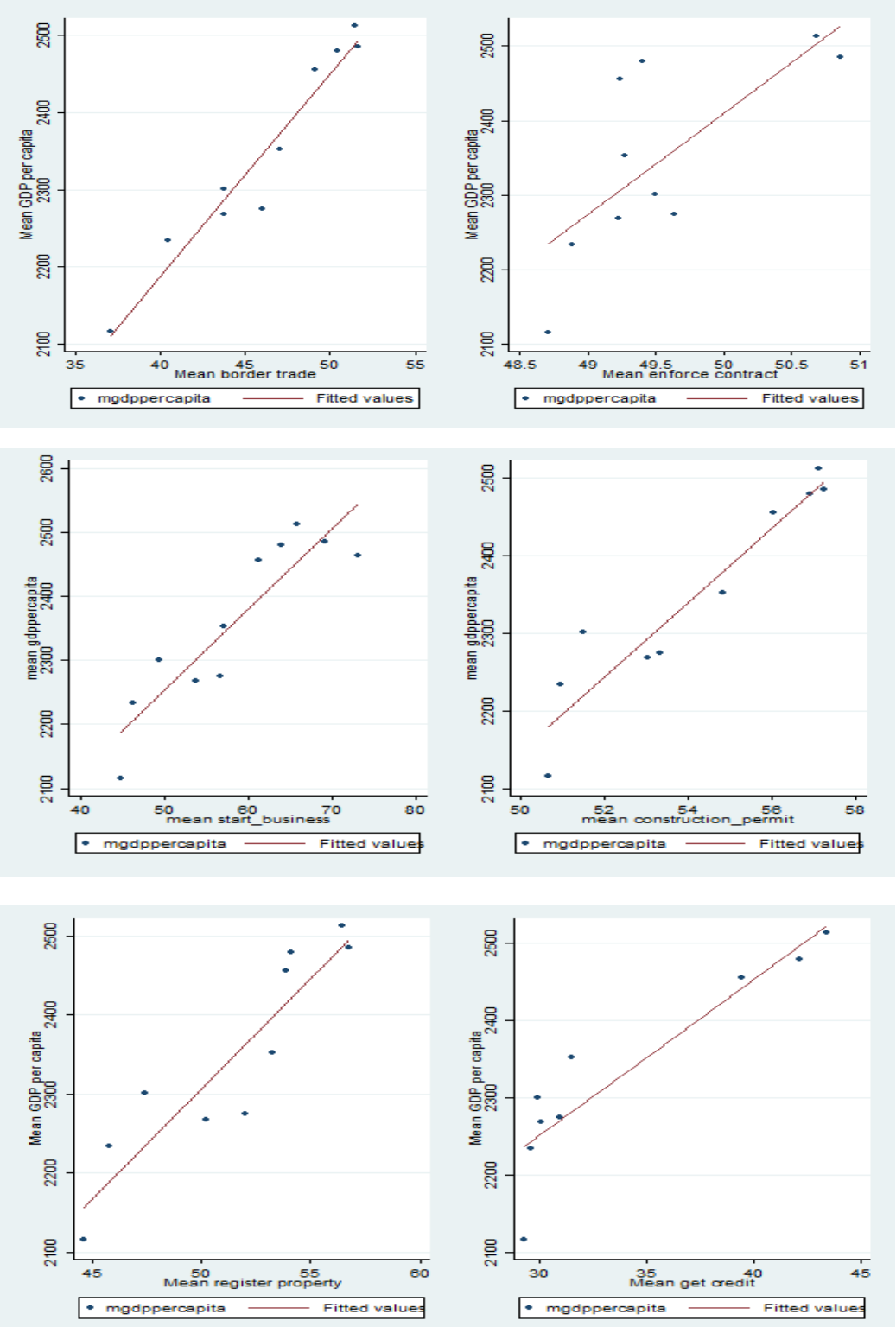
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) GDP per capita	1.000									
(2) Start business	0.162*	1.000								
(3) Permit	0.355*	0.195*	1.000							
(4) Register property	0.208*	0.348*	0.362*	1.000						
(5) Get credit	0.189*	0.524*	0.199*	0.313*	1.000					
(6) Protect investors	0.294*	0.589*	0.127*	0.204*	0.608*	1.000				
(7) Pay tax	0.243*	0.556*	0.027	0.334*	0.437*	0.594*	1.000			
(8) Border trade	0.357*	0.385*	0.326*	0.092	0.142*	0.309*	0.250*	1.000		
(9) Enforce contract	0.322*	0.300*	0.031	0.428*	0.369*	0.253*	0.334*	0.224*	1.000	
(10) Resolve insolvency	0.220*	0.476*	0.099	0.226*	0.485*	0.438*	0.493*	0.327*	0.414*	1.000

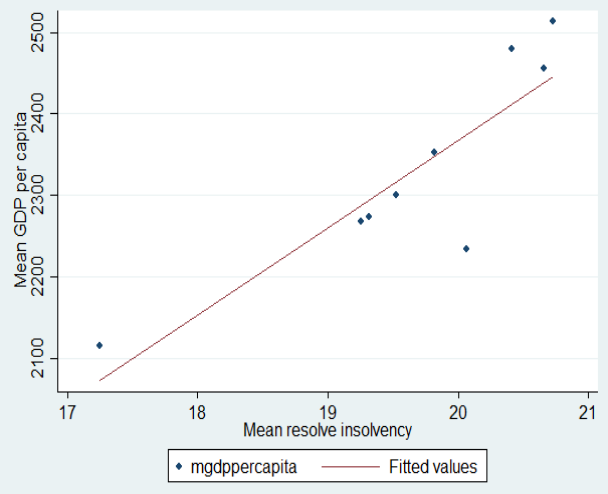
Note: * shows significance at the .05 level.

Source: author's calculations.

Similar results are observed in the following correlation graphs. The graphs demonstrate the correlation between the ease of doing business indicators and GDP per capita. All graphs have a positively sloped line, indicating that a higher doing business score is associated with higher GDP per capita.

Figure 3: Correlation graphs





Source: author's calculations

5 Results

5.1 Baseline results

Table 3 shows the results of the regressions for the OLS and fixed effects models. The results are in four columns where only columns (1) and (3) involve ease of doing business indicators and columns (2) and (4) include control variables.

Table 3: OLS and fixed effects results

GDP per capita	(1) OLS	(2) OLS	(3) Fixed effects	(4) Fixed Effects
Start business	-0.00195	0.00371	0.020	-0.017
	(0.00807)	(0.00757)	(0.014)	(0.013)
Permit	-0.00255	-0.0145	-0.014	-0.014
	(0.00998)	(0.00908)	(0.023)	(0.011)
Register property	-0.00770	-0.0135*	0.024	0.018**
	(0.00792)	(0.00763)	(0.015)	(0.007)
Get credit	0.0111**	0.0132**	0.020**	0.014*
	(0.00553)	(0.00598)	(0.008)	(0.007)
Protect investors	-0.0111	0.0215	0.028	0.008
	(0.00870)	(0.0165)	(0.029)	(0.020)
Pay tax	0.0143*	-0.00541	-0.072*	0.001
	(0.00736)	(0.0110)	(0.039)	(0.021)
Border trade	-0.00822*	-0.00650	-0.016	-0.009
	(0.00419)	(0.00400)	(0.012)	(0.008)
Enforce contract	0.0115	0.00390	-0.127	0.026
	(0.0140)	(0.0138)	(0.089)	(0.039)
Resolve insolvency	0.00101	0.00286	-0.010*	0.005
	(0.00658)	(0.00283)	(0.006)	(0.003)
Capital		0.00868		0.021**
		(0.00909)		(0.010)

Prim enrolment		0.00530		-0.034
		(0.0129)		(0.033)
Population		-0.0120		0.124**
		(0.00902)		(0.048)
Polity2		-0.00400		0.072**
		(0.0120)		(0.035)
GDP per capita	0.999***	0.985***	0.896***	0.767***
	(0.00309)	(0.00976)	(0.040)	(0.063)
Observations	296	221	296	221
R-squared	0.999	0.999	0.850	0.911
Number of i			33	31
Country FE			YES	YES
F statistic	33055***	30984***	594.4***	292.2***

Note: coefficients reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

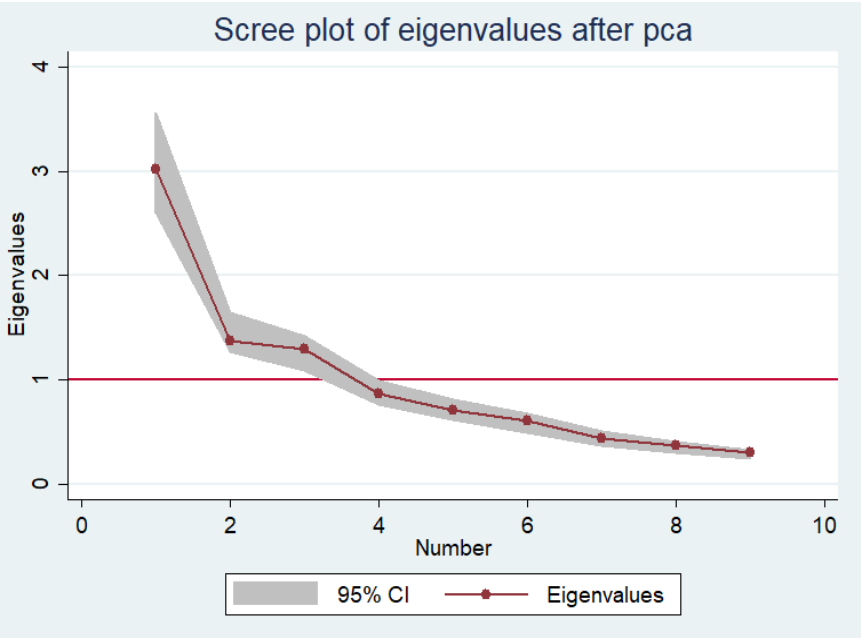
Source: author's calculations

The results show that the coefficient for getting credit is the only one that is positive and significantly correlated with income per capita. Looking at the signs of the other coefficients of the doing business indicators, I observe inconsistency across the columns. Some variables change signs across the estimations, making it difficult to interpret the results. For instance, enforcing contracts and paying taxes are observed to have a negative relationship with income in column (3) but are positively related to income per capita when more variables are considered. This inconsistency makes it difficult to conclude the nature of the association between the doing business indicators and GDP per capita in SSA.

I therefore aggregate the indicators using principal component analysis (PCA). This analysis is a dimension reduction technique that reduces a large set of variables data into a small set which contains most of the information. The PCA compresses interrelated variables while retaining much of the variation in the data set. The new, smaller variables, called the principal components, are uncorrelated and form a proportion of the whole information. The component(s) with a high proportion is (are) used in the data analysis.

Based on the PCA results obtained, I use the first component, named EODB (ease of doing business), which contains a significantly higher proportion than the others. This is observed from the PCA table in the Appendix (Table A1) and the eigenvalue scree plot in Figure 4.

Figure 4: PCA scree plot



Source: author's calculations

Using the same econometric models specified earlier, I regress the model with the EODB component as the doing business indicator index (key explanatory variable). Table 4 shows the results.

Table 4: PCA results

GDP per capita	(1) OLS	(2) OLS	(3) Fixed effects	(4) Fixed effects
EODB	0.339***	0.00232	0.063***	0.003
	(0.0284)	(0.00163)	(0.009)	(0.004)
Capital		0.00620		0.017*
		(0.00853)		(0.009)
Prim enrolment		0.00262		-0.018
		(0.0133)		(0.031)
Population		-0.00643		0.079*
		(0.00817)		(0.039)
Polity2		-0.00257		0.073*
		(0.0128)		(0.037)
GDP per capita		0.992***		0.795***
		(0.00870)		(0.057)
Observations	296	221	296	221
R-squared	0.306	0.999	0.313	0.907
Number of i			33	31
Country FE			YES	YES
F statistic	141.8***	34618***	51.8***	452.3***

Note: coefficients reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: author's calculations

The results show that the aggregated doing business index, the EODB, is consistently positive across the estimators. Furthermore, when considered alone, the index is observed to be statistically

significant, as seen in columns (1) and (3). Based on the PCA, increases in the overall ease of doing business performance are associated with increases in GDP per capita. This confirms the importance of the overall ranking by the World Bank, which combines all indicators to get a clear picture of the ease of doing business.

The PCA results suggest that the different indicators for business should be considered together to effectively develop the business climate. For countries to benefit through business and investment, reforms should aim to increase overall ranking and attracting investors. The United Nations Conference on Trade and Development also elaborates on this in its World Investment report (UNCTAD 2019). South Africa and Kenya are examples of SSA countries whose good rankings and constant reforms have given them an edge in investment. In 2018, Kenya's FDI flows increased by 27 per cent and this is attributed to its efforts to facilitate the private sector and investment as well as to improvement in its ease of doing business ranking (UNCTAD 2019).

5.2 Group regressions

For further analysis, I group the countries by income and democracy levels to understand how the correlation differs across different groups of countries. The literature shows that richer countries and countries with good governance tend to fare better in ease of doing business. Through its reports, the World Bank consistently reveals higher doing business performance amongst developed countries than developing countries, as seen in Figure 1. Regarding governance, Price et al. (2011) state that studies have found a positive relationship between the quality of governance and effective resource allocation, which ultimately leads to a competitive business environment and increased economic growth.

As highlighted in the previous section, the EODB index provides a clear and better understanding of the investigated correlation between ease of doing business and income. For this reason, I report both the PCA and individual results on the ease of doing business.

By income

The income groups are based on the World Bank's classification of countries for 2018/2019. Categorization is based on gross national income (GNI) per capita, where countries with an income of US$12,056 or more are regarded as high-income, US$3,896 to US$12,055 as upper middle-income, US$996 to US$3,895 as lower middle-income, and US$995 or below as low-income countries.

In SSA, the upper middle-income countries include Botswana, Gabon, Equatorial Guinea, Mauritius, Namibia, and South Africa. Seychelles is the only SSA country recognized as a high-income country; however, for inclusion in the regression, it is analysed as upper middle-income. The lower middle-income countries include Angola, Cape Verde, Cameroon, Republic of Congo, Côte d'Ivoire, Djibouti, Ghana, Kenya, Lesotho, Mauritania, Nigeria, Sao Tome and Principe, and Zambia. Finally, the low-income group, which is the largest group, consists of Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, Tanzania, Uganda, and Zimbabwe.

With regard to the individual ease of doing business indicator analysis, getting credit and resolving insolvency increase GDP per capita in low-income countries, as seen in Table 5. As previously mentioned, getting credit in SSA has been identified as an important factor for business. For instance, in the surveys for Tanzania and Zambia, many businesspeople affirm the lack of credit as being one of the biggest constraints to starting and expanding their business. In resolving

insolvency, while the upper middle-income countries in the region like Mauritius and Botswana have a recovery rate of about 65.9 and 67.4 cents per dollar, most low-income countries recover less than 30 cents.

The results for lower middle-income countries show that registering property significantly increases GDP per capita. An easier process for property registration typically encourages an early start of businesses and hence income. On the other hand, the protection of minor investors is observed to decrease GDP per capita. Protecting minority investors can be expected to promote small businesses, which is generally associated with higher income. However, as with other forms of protectionism, the overall effect may be debatable based on efficiency. The negative correlation requires an explanation; there may be several reasons for this outcome such as protection of inefficient firms, lack of fair competition, lobbying activities, and others. An investigation would be useful to find out why the protection of minority investors has an inverse correlation with income in these countries.

Four indicators are found to be significant for the upper middle-income countries. These are registering property, getting credit, enforcing contracts, and trade across borders. The first three are positive and in line with economic expectations. Enforcing contracts ensures a harmonious business environment, which encourages business. Conversely, we observe a negative coefficient for trading across borders. Trading across borders portrays openness which we would expect to improve business and increase economic growth. This unexpected outcome poses questions that open room for further studies on the openness policies of some countries and their effectiveness.

Table 5: Fixed effects results by country income

	(1)	(2)	(3)
GDP per capita	Low	Middle	Upper middle
Start business	-0.028	-0.017	0.349
	(0.016)	(0.028)	(0.234)
Permit	0.007	0.045	-0.014
	(0.013)	(0.038)	(0.216)
Register property	0.003	0.077**	0.048**
	(0.013)	(0.035)	(0.036)
Get credit	0.021**	0.001	0.097**
	(0.009)	(0.014)	(0.114)
Protect investors	0.004	-0.043*	-0.202
	(0.017)	(0.061)	(0.165)
Pay tax	-0.000	0.031	-0.018
	(0.033)	(0.076)	(0.235)
Border trade	-0.006	0.014	-0.274*
	(0.009)	(0.015)	(0.159)
Enforce contract	-0.012	-0.006	0.403**
	(0.046)	(0.053)	(0.288)
Resolve insolvency	0.012**	0.002	0.282
	(0.005)	(0.008)	(0.193)
Capital	0.032***	0.019	0.007
	(0.009)	(0.017)	(0.127)
Prim enrolment	-0.058	-0.031	0.904
	(0.035)	(0.098)	(0.676)
Population	0.116*	0.179**	0.617
	(0.059)	(0.086)	(0.867)
Polity2	0.054**	0.260**	
	(0.023)	(0.112)	

GDP per capita	0.683***	0.747***	0.139
	(0.052)	(0.078)	(0.338)
Observations	123	65	33
R-squared	0.919	0.960	0.940
Number of i	16	10	5
Country FE	YES	YES	YES
F statistic	1074***	69.60***	18.18***

Note: coefficients reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.[1]

Source: author's calculations

Using PCA analysis reveals more conclusive results, as shown in Table 6.

Table 6: PCA results by country income

	(1)	(2)	(3)
GDP per capita	Low	Middle	Upper middle
EODB	0.004	0.007	0.062**
	(0.004)	(0.006)	(0.021)
Capital	0.029***	0.006	0.006
	(0.007)	(0.009)	(0.080)
Prim enrolment	-0.037	-0.013	0.864***
	(0.035)	(0.065)	(0.187)
Population	0.044	0.138*	0.261
	(0.051)	(0.062)	(0.305)
Polity2	0.061**	0.242***	
	(0.024)	(0.045)	
GDP per capita	0.722***	0.819***	0.467*
	(0.050)	(0.049)	(0.196)
Observations	123	65	33
R-squared	0.908	0.953	0.888
Number of i	16	10	5
Country FE	YES	YES	YES
F statistic	345.8***	3767***	36.4***.

Note: coefficients reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.[2]

Source: author's calculations

The EODB results are observed to be positive and consistent across income groups, as expected. The doing business indicators collectively promote GDP per capita, regardless of the income levels of a country. The results are significant for the upper middle-income countries. This is expected as these countries are wealthier and are therefore likely to have the financial capacity, incentive, and infrastructure in place to promote SMEs. For instance, as part of their SME strategy, the European Union, through the European Commission, has about 600 organizations that assist SMEs in member countries (European Commission 2020).

[1] Polity2 results do not appear for the upper middle-income group, which has few countries and therefore too few observations for the variable, resulting in the variable being dropped.

[2] Polity2 results do not appear for the upper middle-income group, which has few countries and therefore too few observations for the variable, resulting in the variable being dropped.

By democracy

The second group analysis is based on democracy. Countries are split according to polity2 scores obtained from the Polity IV Project (Center for Systematic Peace 2019). The Polity IV Project assigns scores from -10 to 10 to categorize three democratic statuses. Countries which score between -10 and -6 are referred to as autocracies, between -5 and 5 as anocracies, and between +6 and +10 as democracies.

In this analysis, for easy interpretation, I classify countries as either democratic or non-democratic. Countries with negative scores are considered non-democratic, while those with a score of at least 0 are considered democratic.

The individual indicators in Table 7 show that for non-democratic countries, registration of property and resolving insolvency are statistically significant in the model. In democratic countries, only registration of property is observed to be significant. Both cases have a positive coefficient and thus progress in the procedures for registering property and resolving insolvency are associated with an increase in GDP per capita.

Table 7: Fixed effects results by country democracy status

	(1)	(2)
GDP per capita	Democratic	Non-democratic
Start business	-0.013	0.012
	(0.014)	(0.011)
Permit	-0.000	-0.045
	(0.018)	(0.026)
Register property	0.018**	0.064***
	(0.008)	(0.018)
Get credit	0.002	0.009
	(0.011)	(0.012)
Protect investors	0.026	0.011
	(0.026)	(0.028)
Pay tax	0.016	0.098
	(0.017)	(0.148)
Border trade	-0.017	0.007
	(0.015)	(0.009)
Enforce contract	0.020	-0.218
	(0.044)	(0.470)
Resolve insolvency	0.004	0.014*
	(0.004)	(0.007)
Capital	0.017*	0.038
	(0.010)	(0.029)
Prim enrolment	-0.019	-0.135*
	(0.049)	(0.064)
Population	0.093	0.292**
	(0.066)	(0.134)
Polity2	0.068**	0.078
	(0.027)	(0.083)
GDP per capita	0.801***	0.423*
	(0.070)	(0.226)
Observations	153	68
R-squared	0.913	0.965
Number of i	25	14

Country FE	YES	YES
F statistic	1627***	79.9***.

Note: coefficients reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: author's calculations

The EODB index is observed to be positive in both cases in Table 8. Regardless of their political status, all countries may observe an increase in income per capita with improvement in their business climate. This can be attributed to the role of institutions. Institutions give investors confidence that they will be able to operate their business in a fair and safe environment which upholds the law and good governance.

Ease of doing business is found to be particularly statistically significant in non-democratic countries. Non-democratic countries do not give investors confidence about institutions, law, and governance. This is detrimental to the level of business activity, as the investors will regard the country to be risky. Thus any efforts to create law and order around starting and operating a business will restore and develop the confidence of investors and consequently boost business activity and income.

Table 8: PCA results by country democracy status

	(1)	(2)
GDP per capita	Democratic	Non-democratic
EODB	0.032	0.025***
	(0.025)	(0.002)
Capital	0.060	0.088***
	(0.038)	(0.023)
Prim enrolment	-0.166	-0.229***
	(0.122)	(0.049)
Population	0.402	0.389***
	(0.321)	(0.099)
Polity2	0.276**	0.112
	(0.113)	(0.075)
Observations	153	68
R-squared	0.552	0.945
Number of i	25	14
Country FE	YES	YES
F statistic	15.2***	222.7***

Note: coefficients reported. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: author's calculations

6 Conclusion and recommendations

Based on the results discussed above, it can be seen that ease of doing business is positively correlated with a country's income. Initial results were not conclusive enough to make accurate inferences about the impact of the ease of doing business and income per capita. However, the aggregated business index showed consistently positive results with income per capita, even across income and democracy groupings.

The SSA region can benefit from reforms to improve the business environment as it still lags in several aspects of doing business, which impede business prosperity. A good example is resolving

insolvency, where there is a big gap in ranking in comparison to OECD countries. The average recovery rate for OECD countries is 70.2 cents in a dollar while that of SSA is only about 20.5 cents. Such a low recovery rate shows that countries are still unable to remedy struggling businesses, which ultimately contributes to the high number of failing businesses and huge losses.

For the past six years, SSA has been leading with the highest number of business regulatory reforms. The reforms have generally resulted in improved rankings for some countries. To continue this trend, countries need to introduce business-friendly policies and adopt innovative methods/technology to make business processes easier.

The establishment of business-friendly policies is important. These policies should aim to reduce the number of procedures and the costs involved in the legalities of starting and running a business. This goes hand in hand with reducing the minimum capital requirement in order to encourage small businesses.

Furthermore, in establishing and implementing these policies, the role of institutions and democratic governance should be considered. The correlation between ease of doing business and income is positive in both democratic and non-democratic countries. This suggests that ease of doing business is beneficial for all countries, even in the presence of poor institutions. However, reforms have a higher chance of being effective when there are strong institutions.

In addition to policies and institutions, there should be an emphasis on the use of technology. With increased use of the internet, such as websites and phone applications, technology has made many processes easier. Applications, inquiries, documentation, and payments are some of the processes that are now carried out online. For instance, South Africa has made it easier to start a business by introducing an online portal to search for a company name, thereby making company name inquiries easier. In 2016, Tanzania established an online system for downloading and processing customs documents, which has given it an edge in international trade.

The adoption of technology is necessary in this modern age. As well as being less costly for the government, it reduces inconvenience for businesses related, for example, to transport, time spent in office queues, and possible delays. This enables businesses to operate more efficiently and maximize income.

In conclusion, because of their currently low ease of doing business performance, sub-Saharan African countries have room for improvement. The resources, population, and high growth rates in the region make it a viable place for business and therefore a focus on creating a conducive environment would make it attractive for both local and foreign investment. With continuous efforts to make it easier to do business, countries can potentially transform their economies and attain sustainable economic development.

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Appendix

Table A1: PCA results

Component	Eigenvalue	Difference	Proportion	Cumulative
EODB	3.0143	1.64008	0.3349	0.3349
Comp2	1.3742	.0756683	0.1527	0.4876
Comp3	1.29855	.433394	0.1443	0.6319
Comp4	0.86526	.151011	0.0961	0.7280
Comp5	0.714149	.099487	0.0793	0.8074
Comp6	0 614662	.17278	0.0683	0.8757
Comp7	0.441882	.071568	0.0491	0.9248
Comp8	0.370314	.0635567	0.0411	0.9659
Comp9	0.306757		0.0341	1.0000

Source: author's calculations

Table A2: Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
GDP per capita	479	2357.244	3500.175	219.2066	20333.94
Start business	481	58.41509	20.09542	2.21	94.51
Permit	437	54.19176	17.8977	0	86.52
Register property	437	51.50449	14.23245	14.11	89.2
Get credit	393	34.1126	18.60477	12.5	87.5
Protect investors	393	42.90033	14.33546	16.67	83.33
Pay tax	481	54.5005	19.41213	11.98	91.92
Border trade	437	46.13968	20.50589	1.87	87.74
Enforce contracts	437	49.54686	12.01015	25.22	67.61
Resolve insolvency	393	19.68135	16.60607	0	72.32
Capital	406	6.68e+09	1.56e+10	5.73e+07	8.74e+10
Prim enrolment	399	101.8783	20.19329	48.96966	149.3073
Population	479	1.92e+07	2.92e+07	84600	1.86e+08
Polity2	462	.6102865	.2374784	.1428571	.952381

Source: author's calculations.