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The effects of foreign direct investment on start-ups in sub-Saharan Africa: A dynamic panel model approach

R. Ochen
School of Economics, Makerere University, Uganda
Email: ochenronald@gmail.com

B.M. Mirembe
Makerere University Business School, Department of Applied Economics, Uganda

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Abstract

Start-ups play a crucial role in developing and emerging economies' growth and development, and foreign direct investment is key to their success. In this study, using data from 2006 to 2018, we employed a system GMM model to examine the impact of foreign direct investment on business start-ups in Sub- Saharan Africa. The findings of this study clearly show that foreign direct investment has a significant and positive effect on business start-ups in the region. Additionally, this study shows that domestic credit to the private sector positively affects business start-ups while high lending interest rates impede business start-ups. Also, business regulations positively impact business start-ups. Based on these compelling findings, we recommend increasing foreign direct investment flows targeting the private sector to encourage more start-up businesses. We also suggest that governments should further reduce the cost of new business procedures to create a favourable environment for start-ups to enter the markets and compete equitably. Furthermore, we assert that Central Banks should stabilize monetary policy to encourage banks to reduce lending interest rates, making it easier for the populace to access low-cost credit for starting new businesses.

1. Introduction

Start-ups drive innovation and growth in various industries and are crucial for economic growth and development in developing and emerging economies. Sub-Saharan Africa (SSA) is witnessing a proliferation of innovative startups brimming with immense potential (Stevanovic and Ochieng, 2023). However, these start-ups often struggle to secure financing due to the high risks of investing in developing countries. To tackle this issue, new financing approaches such as crowdfunding, impact investing, and government grants have emerged. These financing sources largely form the base of foreign direct investment flows to developing countries. Empirical evidence on the relationship between foreign direct investment and start-ups is inconclusive. There is a debate on the effects of foreign direct investment on start-ups in both developing and developed economies. Several studies (Munemo, 2015; Arif and Khan, 2019; Malik et al., 2012; Danakol et al., 2013; Nxazonke and van Wyk, 2019; Boly et al., 2015) done in developing countries found a positive relationship. However, Slesman et al. (2020), Sari et al. (2016), Gerschewski (2013), Danakol et al. (2013), and Aitken and Harrison (1999) found a negative relationship. Furthermore, while some of these studies were conducted in Africa, we cannot generalize their findings to SSA because they do not provide a holistic picture of SSA countries due to the lack of homogeneity across African countries. For instance, Lotto (2022) found that many households in SSA save for medical care rather than business purposes. Moreover, SSA is characterized by underdeveloped capital markets, low labour force development, and generally low domestic investment and productivity (Morrissey, 2012). These observed gaps, therefore, motivate further investigation to build on the existing body of knowledge with an SSA context. Another important aspect that influences the development of start-ups is the level of financial development in the economy. Most

scholars (Arif and Khan, 2019; Munemo, 2017; Munemo, 2015) who attempted this found a positive relationship between the level of financial development (domestic private sector credit) and start-ups.

To the best of our knowledge, empirical literature exploring lending interest rates as a proxy of financial development in determining new business start-ups is still deficient. Hence, our study also intends to bridge this knowledge gap. Furthermore, business regulation is another vital factor that influences new start-ups in developing countries. The cost of doing business and the procedures required could stifle or boost the level of entrepreneurial spirit in a particular country. The available literature, however, shows mixed results. Munemo (2015) found a negative relationship between business regulation and new business start- ups. Whereas Arif and Khan (2019) found a positive relationship between business regulation and start-ups. As such, the study therefore examines the effects of foreign direct investments on new business start-ups in SSA, while controlling for other important factors such as economic growth, financial development, and business regulation. To achieve this, we employ an unbalanced panel of 27 SSA countries and data from 2006 to 2018 and a system Generalized Methods of Moments (GMM) method to establish the interactional effects of foreign direct investments, economic growth, financial development (domestic private sector credit and lending interest rates), and business regulation on start-ups in SSA. In the follow-up sections, we discuss the literature review in section 2, methodology in section 3, empirical results in section 5, and we conclude and provide policy implications in section 5.

2. Literature review

2.1 Theoretical literature

These dependency theorists (Landsburg, 1979; Heijdra & van der Ploeg, 2002) posit that foreign direct investment is exploitative by nature. They argued that emerging economies are the worse off because of exporting raw materials. They further argue that foreign firms crowd out domestic firms by controlling and increasing barriers to entry in key parts of an economy. On the contrary, free-market theorists (Matzner, 1995; Ugochokwe et al., 2013) argued that emerging economies benefit from foreign direct investment through the transfer of efficient production methods, human capital, western knowledge of business ethics and management traits.

The neoclassical through the Solow's growth model suggests decomposing the contribution to output growth of the growth rates of inputs such as technology, capital, labour, and foreign direct investment inflows. Scholars (Blomström & Wolf, 1994; Barrell and Pain, 1997; Ramirez, 2000; Fedderke, 2001) suggest that foreign direct investment in economic growth is strongly tied to the presence of MNCs in the domestic economy, stemming from the technological spillovers from developed economies, thus resulting in efficiency and growth. Mehic et al. (2013) posit that foreign direct investment has a positive influence on the performance of an economy through capital formation and further augments domestic savings and other domestic investments. However, certain scholars have a different perspective. Carkovic & Levine (2002) and Mencinger (2003) found that foreign direct investment has no significant influence on the performance of the host country. Mehic et al. (2013) further substantiated that the influence of foreign direct investment on growth is dependent on how it performs concerning domestic capital.

2.2 Empirical literature

2.2.1 Spillover effects of FDIs on domestic firms

In the past, several studies (Sari et al., 2016; Gerschewski, 2013; Danakil et al., 2013; Malik et al., 2012) focused on the spillover effects and crowding in(out) effects of foreign direct investments on domestic local firms in various countries. Gerschewski (2013) found negative intra-industry productivity spillover effects between Multinational Enterprises (MNEs) and local firms in the same industry and positive inter-industry spillovers through linkages between MNE affiliates and suppliers in different industry sectors. Malik et al. (2012) found that the positive spillover effects of MNEs on developing economies and local firms can be predicted by the competitive advantages that the MNEs hold.

Similarly, Danakol et al. (2013) found the relationship between foreign direct investments and domestic entrepreneurship in aggregate and intra-industry to be negative because of crowding out but there were positive spillovers via the dissemination of technology. Sari et al. (2016) revealed that foreign firms achieve higher productivity but are less efficient than domestic firms. Slesman et al. (2020) found that foreign direct investment has a negative (crowding-out) effect on domestic entrepreneurship at below-threshold levels of institutional capacity and a positive (crowding-in) effect at above-threshold levels of institutional capacity. On the other hand, Ha et al. (2021) found that Greenfield investment negatively affected the level of entrepreneurial activity in the host countries in their study on the effect of Greenfield investment on domestic entrepreneurship using panel data of 110 countries during the period 2001-2018.

Doeringer and Terkla (2009) found that the new U.S. manufacturing plants owned by Japanese multinationals generated jobs at a far higher rate than counterpart branch plants of U.S. corporations. However, Akcigit et al. (2020) found that despite the benefits of such inbound investments for U.S. firms, there was evidence of knowledge spillovers to foreign investors. Eimers et al. (2005) found that in the short term, foreign direct investment will not be beneficial to the local companies in the sector but in the long term, the construction sector will be more efficient and productive. Konings (2003) found that foreign firms performed better than firms without foreign participation only in Poland. In contrast, on average, there are negative spillovers to domestic firms in Bulgaria and Romania, while there are no spillovers to domestic firms in Poland. Apostolov (2015) found that some countries show better results (Macedonia, Serbia, and Croatia), others more moderate ones (Albania and Bosnia and Herzegovina), and there are ones that are more driven by domestic movements rather than foreign (Slovenia). The study also found positive ties between foreign direct investments and gross domestic product in all domestic economies.

2.2.2 Foreign direct investment and domestic entrepreneurship

The impact of foreign direct investments on domestic entrepreneurship has been under-researched in sub-Saharan African countries. Nxazonke and van Wyk (2019) discovered that foreign direct investments have a positive influence on domestic entrepreneurship in South Africa in both the short and long term. Boly et al. (2015) found that large, newly established, and highly productive domestic firms are more likely to benefit from interactions with foreign affiliates. Kotey (2019) provided evidence suggesting that technology spillover could help bridge the technology gap between developed and developing economies. Munemo (2015) found that foreign direct investments significantly encourage the creation of new domestic firms when business start-up regulations are less stringent. Excessive start-up regulations increase the costs of doing business and hinder the positive impact of foreign direct investments on domestic product and labour markets, as well as in foreign markets. Munemo (2017) found that the ability of foreign direct investments to encourage business start-ups depends significantly on financial market development in the host economy. Arif and Khan (2019) also found that foreign direct investment flows stimulate new business start-ups in emerging countries. Additionally, it is noted that financial development facilitates the positive spillovers of foreign direct investments in new business start-ups.

2.3 Summary of literature review

By and large, the existing literature on the relationship between foreign direct investments (FDI) and business start-ups in Africa is inconclusive and lacks comprehensive evidence. Researchers such as Munemo (2015, 2017), Arif and Khan (2019), and Boly et al. (2015), have attempted to explore this relationship, but their findings do not provide conclusive evidence in the context of SSA. Therefore, our study aims to fill this gap by examining the determinants of business start-ups in SSA and incorporating lending interest rates as an additional factor. This study focuses on the effects of FDI on business start-ups in SSA, which is an area that has not been explored in depth. We aim to examine the relationship between FDI and business start-ups in SSA by analyzing data from various sources. In addition, we incorporate lending interest rates in our analysis to determine their impact on business start-ups in SSA. By analyzing the determinants of business start-ups in SSA, we hope to provide a more comprehensive understanding of the factors that affect entrepreneurship in the region. Our study contributes to the literature on entrepreneurship in SSA and provides insights for policymakers and investors interested in promoting entrepreneurship.

3. Methodology

3.1 Empirical model

To investigate the objective of the study, we used a system GMM empirical model used by similar studies (Munemo, 2015, 2017; Arif and Khan, 2019; Ha et al., 2021) to examine the effects of foreign direct investments on start-ups. The empirical model is shown below:

$$\boldsymbol{New\ Business\ Density_{it}} = \boldsymbol{\alpha_0} + \boldsymbol{\beta_1 New\ Business\ Density_{it-1}} + \boldsymbol{\beta_2 Foreign\ Direct\ Investment_{it}} + \boldsymbol{\beta_3 x_{it}} + \boldsymbol{\mu_{it}} + \boldsymbol{\varepsilon_{it}} \quad (1)$$

where New Business Density is designated as a proxy variable for new start-ups and the dependent variable of the study; Foreign Direct Investment denotes the independent variable of interest of this study; α_0 denotes the constant of the study; β_1 denotes the slope coefficient of the lagged dependent variable, New Business Density; β_2 denotes the coefficient of foreign direct investment; β_3 denotes a vector for the coefficients of the control variables (denoted by a vector, x) that could determine the level of new business start-ups and affect entrepreneurial activity, including economic (or GDP) growth, business regulations, which are denoted as the cost of new business start-up procedure as a percentage of GNI,

and financial development indicators of domestic credit to the private sector and lending interest rates; μit is the individual-specific effects; and εit denotes the error term for countries i at time t.

3.2 Empirical strategy

The study adopted a linear dynamic panel model developed by (Arellano and Bond, 1991; and Blundell et al. 2000). The autoregressive dynamic panel equation in levels is exemplified in the following equations:

$$\boldsymbol{\gamma it} = \boldsymbol{\alpha \gamma it{-}1} + \boldsymbol{\beta' xit} + \boldsymbol{\mu it} \quad \ldots\ldots (2)$$

$$\boldsymbol{\mu it} = \boldsymbol{\eta i} + \boldsymbol{\nu it} \quad \ldots\ldots (3)$$

Where; γit = dependent variable measured for countries i at time t, α = coefficient for short-run effects of the lagged dependent variable ($\gamma it{-}1$), β = coefficient of independent variables xit , μi= individual-specific effects, i = 1,…, N and t = 2,…, T and $\eta i + \nu it$ is the usual error components decomposition of the error term, Nis large, and T is fixed and $|\alpha| < 1$.

Allowing the inclusion of lagged instrumental variables (IVs) of the independent variables provides equation 3 below:

$$\boldsymbol{\gamma it} = \boldsymbol{\alpha \gamma it{-}1} + \boldsymbol{\beta' 1 xit} + \boldsymbol{\beta' 2 xit{-}1} + \boldsymbol{\eta i} + \boldsymbol{\nu it} \quad \ldots\ldots (4)$$

Introducing the first differences to equation 3 above provides a system GMM estimator as shown below:

$$\boldsymbol{\Delta \gamma it} = \boldsymbol{\alpha}(\boldsymbol{\Delta \gamma it{-}1}) + \boldsymbol{\beta' 1}(\boldsymbol{\Delta xit}) + \boldsymbol{\beta'}(\boldsymbol{\Delta xit{-}1}) + \boldsymbol{\Delta \eta i} + \boldsymbol{\Delta \nu it} \quad \ldots\ldots (5)$$

Why the system dynamic GMM panel model for this study? First, the system GMM model is suitable for large N and small T panels (N>T). Second, the introduction of the first differences to the dynamic linear panel model provides a system GMM model that addresses the serial correlation, endogeneity, and heteroscedasticity problems because of the use of IVs (Arellano and Bond, 1991; Blundell et al., 2000). This is a serious econometric problem of large macroeconomic panels (Baltagi, 2005).

That said, we first conducted a preliminary exposition of the data, for example, carrying out a descriptive analysis of the data and then the correlation matrix to determine the strength and direction of causation. However, we did not conduct the panel Unit Root Test for the stationarity of the variables due to the relatively short T and the unbalanced structure of the panel used in the study. We then estimated a linear dynamic panel model with Fixed Effects, but this possessed a problem of endogeneity and biased inconsistent estimators as noted by Nickel (1981). We then went ahead and estimated the linear dynamic panel model in the first differences in panel option with one lag dependent variable and 3 lags of the internal instrumental variables (IVs) as independent variables (Arellano and Bond, 1991; Blundell et al., 2000). We use internal IVs because economic theory states that internal IVs are more consistent and non-biased than eternal IVs. We also conducted post-estimation tests like the second-order validity of instruments using the Sargan and Hansen test. This was done to check for the reliability and validity of the estimated system GMM model.

3.3 Data and properties

The study employed unbalanced longitudinal panel annual data from 2006 to 2018, providing 13 years of the study, and the 27 panels of countries in SSA (see Table A2). The scope from 2006 to 2018 was because a significant number of countries in SSA countries have missing data points for missing cases in new business density and lending interest rates. As a result, the study scope was limited to those years. These were predominantly war-ravaged countries and countries where Islamic banking could occur. Data on all the variables used in the study, including New Business Density, Foreign Direct Investment, GDP Growth, Business Regulation, Domestic Credit to the Private Sector, and Lending Interest Rates, is sourced from the World Bank Development Indicators repository (see further details of data in Table A1). Further, the choice and the expected sign of study variables are informed by reviewed empirical literature (Munemo, 2015; Arif and Khan, 2019; Malik et al., 2012; Ha et al., 2021; Apostolov, 2015; Danakol et al., 2013; Nxazonke and van Wyk, 2019; Boly et al., 2015).

Table 1 summarized the descriptive statistics of the study, indicating that the average number of newly registered companies with limited Liability per 1000 people aged between 15-64 from 2006 to 2018 was about 2. The average inflows of foreign direct investment in SSA were about 6 percent of their respective gross domestic product. On average, the SSA countries grew by about 5 percent between 2006 and 2018. Business regulations proxied by the cost of business start-up procedures (% of GNI per capita), thus the average cost of starting a new business was 62 percent of the gross national incomes of SSA countries between 2006 and 2018, with a maximum of 1314.6 percent and a minimum of 0.2 percent. While the level of financial development in SSA countries between 2006 and 2018 averaged approximately 25 percent of GDP, for the domestic credit to the private sector from the banks and the lending interest rates, the average was approximately 15 percent in the same period.

Table 1: Summary of descriptive statistics of the variables under study (2006 to 2018).

	New Business Density	Foreign Direct Investment	GDP Growth	Business Regulation	Domestic Private Sector Credit	Lending Interest Rates
Mean	1.94	5.94	4.51	62.03	24.98	14.56
Median	0.77	3.21	5.00	32.20	16.65	13.17
Maximum	12.21	86.99	20.72	1314.60	104.85	60.00
Minimum	0.01	-4.30	-46.08	0.20	1.05	4.98
Std. Dev.	2.76	10.79	5.08	129.91	22.83	8.96
Observations	209	209	209	209	209	209

Source: Authors' construction

In Table 2, the correlation matrix of the study variables shows a negative weak correlation between foreign direct investment and new business density. This could imply that much of the foreign direct investment inflows are geared towards government development programs rather than the private sector. Likewise, the correlation between GDP growth and new business density is negative and weak. This was anticipated as many of the new businesses started in SSA do not live to witness their birthday due unfavourable environment that they operate in, which threatens their survival, hence benign contribution to their GDP growth. This is justified by the inverse relationship between business regulation and new business density. This is also justified by the strong and positive correlation between domestic credit and private and new business density. The lending interest rates have been prevalently high almost the SSA and detrimental to private sector business development. This explains the negative correlation between lending interest rates and new business density. Also, the off-diagonal elements are 1.

Table 2: Correlation matrix of the study variables

	New Business Density	Foreign Direct Investment	GDP Growth	Business Regulations	Domestic Private Sector Credit	Lending Interest Rates
New Business Density	1	-0.10	-0.13	-0.24	0.85	-0.22
Foreign Direct Investment	-0.10	1	0.09	-0.04	-0.07	0.02
GDP Growth	-0.13	0.09	1	0.02	-0.09	0.05
Business Regulations	-0.24	-0.04	0.03	1	-0.25	0.15
Domestic Private Sector Credit	0.85	-0.07	-0.09	-0.25	1	-0.31
Lending Interest Rates	-0.22	0.02	0.05	0.15	-0.31	1

Source: Authors' construction

4. Empirical Results

In Table 3, the system GMM model shows that the new business density, represented as business start-ups, is the dependent variable of the study. We observe a positive and significant lag of the dependent variable at 0.8, with a 100 percent change in foreign direct investment associated with approximately a 3 percent change in new business start-ups at a 5 percent level of significance in the short run, ceteris paribus. In the short run, a 100 percent change in GDP growth leads to about an 8 percent change in new business start-ups at a 5 percent level of significance. Holding other factors constant, a 100 percent increase in the cost of business procedures leads to an increase in the number of new business start-ups of about 0.3 percent in the short run. When focusing on the effects of financial development indicators, and holding other factors constant, a 100 percent increase in domestic credit to the private sector leads to an increase in new business start-ups by about 5 percent in the short run. Similarly, lending interest rates negatively affect new business start-ups in SSA. Holding other factors constant, a 100 percent rise in lending interest rates by banks is associated with about a 1.0 percent decrease in new businesses in the short run.

Table 3: System GMM results (Dependent variable: New Business Density)

Variables	**System GMM estimates**
New Business Density (-1)	0.84** (275.59)
Foreign Direct Investment	0.03** (233.34)
GDP Growth	0.08** (39.29)
Business Regulation	0.003** (4.40)
Domestic Private Sector Credit	0.05** (76.77)
Lending Interest Rates	-0.01** (-3.82)
Mean dependent variable	0.13
S.E. of regression	0.90
Post Diagnostic Statistics	
J-statistic	13.87
Prob.(J-statistic)	0.46
Instrument rank	21
AR (2)	0.10

Source: Author's construction using the system GMM model estimates

Notes: The first plane shows the GMM coefficients at their levels of significance I. e. *p < 0.1; **p < 0.05; ***p < 0.01, and t-statistics are reported in parentheses. The second plane shows the system GMM model diagnostics - the Hansen J- Statistics, and its probability, and the second order [AR (2)] Arellano-Bond Serial Correlation Test.

4.1 Discussion of empirical results

The empirical results illustrated in Table 3 show that foreign direct investment and new business density exhibit a positive and significant relationship; hence, foreign direct investment stances a crowding-in effect on new business start- ups in SSA. Similar studies (Arif and Khan, 2019; Mehar & Al-Faryan, 2022; Munemo, 2015; Boly et al., 2015) that have attempted to study the effects of foreign direct investment on new business start-ups found that foreign direct investment crowd in new business starts. Arif and Khan (2019) argued that this positive relationship is attributed to spillovers from foreign firms in the form of knowledge and skills transfer, and diffusion of advanced technologies to domestic firms.
In addition, the results also indicate that GDP growth has a positive and significant relationship with new business start-ups. Similarly, Arif and Khan (2019) alluded to a positive relationship between GDP growth and new business start- ups. We also found a positive and significant relationship between the cost of business regulation and new business start- ups.

However, this differs from the findings of Munemo (2015), who found a negative relationship between business regulation and new business start-ups in Africa. The difference could be attributed to the dependent variable used in his study. He uses the log of new firms per capita, whereas we use new business density as a proxy variable for start-ups. However, he found similar results alluding to a positive relationship between foreign direct investment and new business start-ups when he subsequently adopted new business density as the dependent variable, vindicating our results. Arif and Khan (2019) further substantiate our findings on the positive effect of business regulation on start-ups.

Moreover, we found we found a positive and significant relationship between the level of financial development and new business start-ups. This alluded to the findings of Arif and Khan (2019). They argued that when access to funds is available in the market, it motivates entrepreneurs to invest more in their new ventures. Relatedly, we found that lending interest rates hurt new business start-ups. This could be attributed to the high lending interest rates observed in many SSA countries that deter the sprouting of many survivals of many start-ups. Also, this crowds out potential entrepreneurs from accessing credit from banks to invest in start-ups.

4.2 Robustness checks

To check the validity and reliability of the system GMM model results, we used second-order serial correlation estimated by the Arellano-Bond Serial Correlation Test in Table 3. Using second-order serial correlation [AR (2)] is more important in validating the study results. The probability of the AR (2) is 0.9985 which is not significant at a 5 percent level of significance, implying no second-order serial correlation. This further implies that the number of lags used in the internal instrumental variables (IVIs) are not endogenous; thus, there were good IVs used in the GMM model. Also, in Table 3, we observe that the J-Statistic at about 13.9 is close to zero and the probability of the J-Statistic is far from zero. This implies consistency in identifying restrictions of the instrumental variables, and thus, the model is good. Further, the instrumental rank equals 21, which is lower than the number of panels, which is good for the model. We also observe that the residuals of the estimated system GMM model move consistently around the zero mean, implying the model was well estimated and the residuals are normally distributed (also see Figure A1).

5. Conclusion and policy implications

Using unbalanced panel data from 2006 to 2018 and a system GMM model, we examined the effects of foreign direct investment on new business start-ups in 27 SSA countries. We found that foreign direct investment has a positive and significant effect on new business start-ups in SSA. This implies that foreign direct investment in SSA crowds in new business start-ups through the positive spillover effects it comes with to the domestic firms in the form of knowledge and skills transfer and technological advancements. We further found that the effects of financial development in SSA are mixed, domestic credit to the private sector positively affects new business start-ups while the lending interest rates negatively affect new business start-ups. Also, business regulations positively impact new business start-ups in SSA. As such, we conclude that in the short run, foreign direct investment positively affects start-ups in SSA while financial development indicators pose mixed reaction effects on start-ups in SSA. Moreover, regulating businesses provides a conducive environment for healthy competition for startups to sprout in the market. Therefore, we would recommend that for boosting foreign direct investments especially geared towards the private sector to sprout more start-up businesses since we observe a positive and significant but trivial effect. On the other hand, we would also recommend that the governments lessen the cost of new business procedures as these affect the level of business start-ups. More so, we would recommend that Central Banks stabilize the monetary policy to induce the commercial banks to reduce the lending interest rates so that the populace can have access to low-cost credit for starting new businesses. However, the study was not without flaws. The overall sample of the countries in SSA was reduced due to insufficient data points and a pure lack of data on crucial variables of the study, especially variables on new business density and lending interest rates from countries including Cameroon, Angola, Gabon, Central African Republic, Comoros, Congo Republic, Djibouti, Equatorial Guinea, Eritrea, Somalia, and The Gambia. As a result, this also prompted the reduction of the scope of the study to focus between 2006 and 2018. Thus, we believe future studies will impute the missing data points to have a balanced panel. Further studies can also look at the effect of foreign direct investment on the already-established businesses in SSA.

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Appendices

Table A1: Data variables measurement description and sources

Variables	Measurement Unit	Description	Expected Sign	Sources
New Business Density	Numbers	New businesses are registered per 1,000 people ages 15-64, every calendar year—the number of newly registered companies with limited Liability.	Positive	World Bank Development Indicators data
Foreign Direct Investment	Percentages	Foreign direct investment, net inflows (% of GDP).	Positive	World Bank Development Indicators data
GDP Growth	Percentages	The annual percentage growth rate of GDP at market prices is based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars.	Positive	World Bank Development Indicators data
Business Regulation	Percentages	Cost of business start-up procedures (% of GNI per capita)	Positive	World Bank Development Indicators data
Domestic Private Sector Credit	Percentages	Domestic credit to the private sector by banks (% of GDP)	Positive	World Bank Development Indicators data
Lending Interest Rates	Percentages	The lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector.	Negative	World Bank Development Indicators data

Table A2: List of countries from Sub-Saharan Africa used in the study

Country Name	Country Code
Benin	BEN
Burkina Faso	BFA
Cabo Verde	CPV
Cote d'Ivoire	CIV
Democratic Republic of Congo	COD
Eswatini	SWZ
Ethiopia	ETH
Kenya	KEN
Lesotho	LSO
Liberia	LBR
Madagascar	MDG
Malawi	MWI
Mali	MLI
Mauritania	MRT
Mauritius	MUS
Mozambique	MOZ
Niger	NER
Nigeria	NGA
Rwanda	RWA
Seychelles	SYC
Sierra Leone	SLE
South Africa	ZAF
South Sudan	SSD
Tanzania	TZA
Togo	TGO
Uganda	UGA
Zambia	ZMB

Figure A1: Residuals of the system GMM estimated model