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**RELATIONSHIP BETWEEN STARTING UP UNREGISTERED AND FIRM  
PERFORMANCE IN SUB-SAHARAN AFRICA: DOES  
DURATION MATTER?**

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## **Abstract**

This paper investigates whether start-up firms that remain unregistered for longer outperform their peers in the long run. It hypothesises that the benefit of staying unregistered is non-linear in time and depends on institutional context.

This paper considers the relationship between years spent unregistered and employment productivity growth in the informal sectors of Nigeria, Kenya and South Africa, highlighting the significant role of institutional contexts in shaping entrepreneurial decisions and firm performance (Williams, Martinez-Perez, & Kedir, 2017; Assenova & Sorenson, 2017; Autio & Fu, 2015; Galdino, Molina-Sieiro, Lamont, & Holmes Jr, 2023). World Bank Enterprise Survey data was analysed using linear multivariate regression analysis, which enabled examination of the relationship between years spent unregistered and firm employee productivity growth, determining its statistical significance while controlling for other independent variables. The findings underscore the heterogeneity of this relationship across developing countries. This suggests that policymakers must consider distinct institutional environments to foster economic growth and achieve Sustainable Development Goal 8; which aims to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all (United Nations, 2023).

## **1. Introduction**

Informal sectors in developing countries are understudied (Williams, 2015; Gërkhani, 2004; Ketchen Jr, Ireland, & Bruton, 2012) and are made significant by the large number of people that they employ (Autio & Fu, 2015). According to the International Labour Organization (ILO), 85% of employment in Sub-Saharan Africa is informal (International Labour Organization, 2022; International Labour Organization, 2023). This paper employs the United Nations definition of informal entrepreneurs as those running firms that are not formally registered with the national government (Odera, 2013). Formal institutions represent the laws and regulations of government. Informal institutions are concerned with societal norms, values, and beliefs; they serve as an alternative guiding framework where informal institutions fail to structure and govern economic activity.

The paper focuses on Nigeria, South Africa and Kenya, which are key entry points to the West, South, and East African markets, respectively. Nigeria and South Africa are important because they are the largest economies in Sub-Saharan Africa, generating over 50% of the gross domestic product in the

region (Council on Foreign Relations, 2023). Nigeria and South Africa are the largest economies in Sub-Saharan Africa, generating over 50% of the region's gross domestic product (Council on Foreign Relations, 2023). Kenya has the largest economy in East Africa and the highest financial inclusion in Sub-Saharan Africa (The National Treasury of Kenya, 2023; Schneider & Williams, 2013; Jutting & Laiglesia, 2009). These countries have been identified as having the most developed startup ecosystems in Africa (Business Insider Africa, 2022).

The importance of the informal sector is emphasised by the United Nations' 8th Sustainable Development Goal (SDG), to "... Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (United Nations, 2023). Target 8.3 of the SDG is more specific, to "promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalisation and growth of micro, small and medium-sized enterprises including through access to financial services" (United Nations, 2023). The only indicator for target 8.3 is the "proportion of informal employment by sector and sex", research on employment productivity growth should be undertaken to explore how to drive growth in employment (United Nations, 2023; International Labour Organization, 2023). This aligns with Williams, Martinez-Perez, and Kedir (2017), who argue that employment productivity growth is an effective measure of firm performance as it reflects the efficiency of labour resource utilization, the quality of the workforce, and the effectiveness of management practices.

If firms register only when the benefits of registration outweigh its costs, what happens to firms that never reach this point or that never register for other reasons? Can they enjoy the benefits of non-registration *ad infinitum*? While acknowledging the importance of the cost of registration as a barrier for start-up firms in developing countries, this paper will focus on institutions and their impact on years spent unregistered. To investigate this, the paper extends the postulation by Williams, Martinez-Perez, and Kedir (2017) through the analysis of 3 hypotheses:

1. The relationship between years spent unregistered and employment productivity growth is heterogeneous across developing countries. In some countries, strong informal networks support unregistered firms, while in others, the lack of formal registration limits access to resources and hinders growth (Williams, Martinez-Perez, & Kedir, 2017).
2. The relationship between years spent unregistered and employment productivity growth is non-

linear in time. Initially, firms may benefit from avoiding regulatory costs, enhancing short-term productivity. Over time, however, disadvantages such as limited access to credit and legal protections outweigh these benefits, leading to a decline in productivity growth (Williams, Martinez-Perez, & Kedir, 2017).

3. The non-linear relationship between years spent unregistered and employment productivity growth is heterogeneous across developing countries and influenced by country-specific factors. In countries with robust informal networks, firms may sustain productivity growth longer without registration. In contrast, in countries with stringent regulations, the decline in productivity growth occurs more rapidly (Williams, Martinez-Perez, & Kedir, 2017).

This paper is organised as follows: The next section presents the literature review, which is made up of two sections: theoretical framework and empirical evidence. Section three is data and methodology, which evaluates the relationship between years without registration and employment productivity growth, the data used, and the specifications to be estimated. In section four, the results and implications section describe the models to be estimated. Section five concludes the paper.

## **1. Literature Review**

### **1.1 Significance and Persistence of the Informal Sector**

The informal sector is prominently considered either a development pathway or a barrier to economic growth (Shleifer & La Porta, 2014). In the 1990s, the size of the informal sector had increased to a point of prominence, where it could no longer be merely considered as a pathway to formalisation. This was largely due to the invaluable contribution of the informal sector to employment, gross domestic product, and development in Sub-Saharan Africa (Odera, 2013). Over the years, there has been considerable growth in literature which considers the informal sector as central to the socio-economic activities of developing countries (Gërkhani, 2004). Today, the International Labour Organization (2023) acknowledges that informal sectors may persist due to formal laws being inapplicable to certain contexts and regulations not being observed in others.

The informal sector in Sub-Saharan Africa would benefit from further study to reach SDG 8. Especially since informal sectors have been persistent over time in Sub-Saharan Africa (Ulyssea, 2020; Charmes, 2016; A.G. Aguilar, 2009; Shleifer & La Porta, 2014; The World Bank, 2022). Contrary to conventional knowledge, Shleifer and La Porta (2014) found that informal firms rarely formalise their operations

and that they do not compete with formal firms but rather operate in distinct economic spaces (Shleifer & La Porta, 2014).

In Sub-Saharan Africa, the informal sector is the largest employer. Particularly in cities that are growing rapidly due to urbanisation, without comparable growth in employment opportunities (Hart, 2010). This situation is compounded by economies that are not large enough to absorb the working-age population and a regional youth wave (Martin & Magidi, 2021; Mkandawire, 2010). Increased studies on the informal sector have the potential to result in policy which assists in exploiting the relationship between entrepreneurship and urbanisation, where entrepreneurs hasten urbanisation and urbanisation facilitates and brings about multiple factors, that contribute to the growth of entrepreneurial enterprises, even where they are informal (Naudé, 2018).

### **1.2 Institutional Impact on Firm Performance**

While studies suggest that disparities in firm performance can be partially attributed to institutional differences, analysis is constrained by the limited data on the informal economy (Weidner & Faruq, 2018; LiPuma, Newbert, & Doh, 2013). This relationship is intriguing for Sub-Saharan Africa, where approximately 85% of employment was found to be informal and intricately linked to the formal economy (International Labour Organization, 2022). This further emphasises SDG 8, which is made important by the large and growing working-age population in the region, whose vulnerability in the informal economy was deepened during the COVID-19 crisis (United Nations, 2023; International Labour Organization, 2023). While acknowledging sales and labour productivity growth as important performance indicators, this paper focuses on employment productivity growth as a measure of firm performance.

It is widely accepted that firm registration increases credibility and that complying with the law of registration signals legitimacy to investors and consumers. This theory has been disputed by Williams, Martinez-Perez, and Kedir (2017) – who argue that this postulation cannot be transferred to developing countries, specifically, they put forward that firms may choose not to register either due to the presence of a dominant institution of social legitimacy or firm costs associated with registration. The cost argument is supported by Auto and Fu (2015), who cite market imperfections prevalent in developing countries as a reason why the cost of registration may outweigh the potential benefits of registration for small firms and start-ups. Firms in developing countries rarely receive efficient service delivery

and institutional benefits that create an environment which enables them to thrive and thus warrant registration costs (Saka-Helmhout, Chappin, & Vermeulen, 2020). The implication is that it may not be logical for a firm in a developing country to register as a pathway to operating in the formal economy (Bennett, 2010) until they are assured that the existing opportunities are value-creating (Bruton, Webb, & Siqueira, 2016) beyond the costs they will incur from registration.

In the absence of firm registration as proof of ability or guarantee that one will be able to seek recourse should the service or product that one has paid for not be delivered, what replaces this institution? Odera (2013) has found trust to be prevalent in filling the institutional void left by the lack of adequate formal institutions to build social networks and enhance firm cooperation.

### **1.3 Informal Institutions and Entrepreneurial Dynamics**

In developing countries, weak formal institutions lead to a dependence on informal institutions which entrepreneurs leverage to operate and increase their performance (Williams, Martinez-Perez, & Kedir, 2017). Autio and Fu (2015) advance the argument that developing countries have a more nuanced view of firm legitimacy; where both legal and social legitimacy exist, and social legitimacy is not derived through firm registration. A holistic analysis of the informal sector requires the expansion of institutions beyond formal to cognitive and normative institutions (Godfrey, 2015; North, 1990; Scott, 2008). Firms are structured and governed by existing norms, values, and beliefs in the context where they operate; regardless of the existing formal laws and regulations (London, Esper, Grogan-Kaylor, & Kistruck, 2014; Mair, Marti, & Ventresca, 2012).

The presence of opportunities and threats encourages entrepreneurs in developing countries to use informality to test the waters and contain risks. Suppose the informal firm is successful, and the industry stabilizes. In that case, the entrepreneur can look to later formalise to grow the firm and become more visible without increasing enforcement risks associated with informality (Bruton, Webb, & Siqueira, 2016). The concept of dynamism, which captures the extent to which change within an industry is random, making future conditions hard to predict and increasing uncertainty, was found to be positively related to the likelihood of informality by Bruton, Webb and Siqueira (2016). Dynamism may result from many factors, including technological progress, sociocultural, demographic variations or regulatory changes changing the competitive structure within an industry and the ability of

institutions to accommodate new domains of activity (Bruton, Webb, & Siqueira, 2016; Williams, Martinez-Perez, & Kedir, 2017).

Williams, Martinez-Perez, and Kedir (2017) evaluated whether the future performance of start-up firms is higher the longer they spend unregistered. They found that being registered may not lead to better performance, particularly in developing countries. This contrasts with the work of Assenova and Sorenson (2017), who considered how informality at start-up impacts firm performance in Sub-Saharan Africa. They found that firms that register at the onset of operations experience greater employment productivity growth than those who do not register (Assenova & Sorenson, 2017). While Assenova and Sorenson (2017) consider a model beyond linear specification, they leverage less than half of the covariates used by Williams, Martinez-Perez, and Kedir (2017) in their specification. For this paper, the most significant variable that is absent from the analysis by Assenova and Sorenson (2017) is years spent unregistered, and thus do not consider the impact of non-registration over time.

According to The World Bank (2022), the large size of the informal sector in Sub-Saharan Africa is a symptom of development challenges such as weak institutions. This may give rise to informal institutions which are stronger than formal ones, following the postulation by Beall and Fox (2009), that informal markets operate where formal markets or government are absent or weak. Therefore, the benefits that firms stand to gain from informal institutions may outweigh the benefits from formal ones through firm registration, up to a point (The World Bank, 2022). To control for this, one might consider decreasing the costs of registration; however, Ulyssea (2020) found that reducing the costs of formalising a firm has limited to no impact on increasing formalisation while increasing the benefits of formality is more effective for registration.

#### **1.4 Country-Specific Motivations for Formalisation**

In Sub-Saharan Africa, the motivations for formalising a business can vary significantly based on each country's unique socio-economic and regulatory environments. In South Africa, formalisation is often driven by the need to access government contracts and benefit from policies such as Black Economic Empowerment (BEE). The BEE policy aims to redress the inequalities of apartheid by giving previously disadvantaged groups economic opportunities that were not available to them in the past (South African Government, 2023). Firms that are formally registered can benefit from BEE certification, which can enhance their eligibility for government tenders and contracts. Formalisation

may also provide access to financial services, including loans and grants, which are crucial for business expansion and sustainability (Rogerson, 2018). However, the process of formalisation can be costly by exposing businesses to higher tax liabilities and increased scrutiny from regulatory bodies (SARS, 2023). It may also be time-consuming, particularly for small businesses whose compliance with regulatory requirements and BEE criteria can be complex, diverting resources away from core business activities (SARS, 2023).

In Nigeria, the motivations for formalisation are often linked to access to finance and market opportunities. The Central Bank of Nigeria (CBN) and other financial institutions typically require businesses to be formally registered to qualify for loans and other financial products (Central Bank of Nigeria, 2023). Formalisation can enhance a firm's credibility and trustworthiness, making it easier to attract investors and partners. The Nigerian government has also implemented various initiatives to encourage formalisation, such as the Business Incentive Strategy (BIS), which provides tax holidays and other incentives for newly registered businesses (Nigeria Investment Promotion Commission, 2023). However, the formalisation process in Nigeria can be bureaucratic and fraught with inefficiencies, discouraging small businesses from registering. Once formalised, businesses may face increased regulatory compliance costs and potential exposure to corruption within the regulatory framework (Olawale, 2020).

Kenyan formalisation is often motivated by the need to access broader markets and participate in government procurement processes. The Kenyan government has established the Access to Government Procurement Opportunities (AGPO) programme, which reserves 30% of government tenders for youth, women, and persons with disabilities who own registered businesses (Government of Kenya, 2023). This creates a strong incentive for informal businesses to formalise to take advantage of these opportunities. Formalisation can provide businesses with access to training and capacity-building programmes offered by various government and non-governmental organisations, which can enhance their competitiveness and growth prospects (Kenya Institute for Public Policy Research and Analysis, 2023). The formalisation process in Kenya can be daunting for small businesses. Compliance with regulatory standards can be costly and time-consuming, with formalised businesses facing increased tax obligations and regulatory scrutiny, which can strain limited resources (KRA, 2023).

These country-specific motivations demonstrate that formalisation is not merely a bureaucratic requirement, but a strategic decision influenced by each country's unique socio-economic and regulatory context. Understanding these motivations can inform policies and interventions aimed at encouraging formalisation and supporting the growth of the informal sector in Sub-Saharan Africa.

## **2. Data and Methodology**

### **2.1 Data Description**

The analysis exclusively makes use of World Bank Enterprise Survey Data (WBES). The WBES questionnaire is harmonised and follows a global methodology, making the data comparable across countries as well as over time (The World Bank's Enterprise Surveys, 2023). WBES collects data using a stratified random sample of non-agricultural, formal, private-sector firms with five or more employees. The data is stratified by firm size, firm sector, and geographic regions, which are selected based on where major economic activity takes place. Public utilities, government services, health care, and financial service sectors are not included in the dataset (The World Bank's Enterprise Surveys, 2023). The sampling strategy undertaken by WBES factors in a 25% non-response rate per stratum to deal with attrition, this ensures that there are sufficient valid responses to compute performance indicators with precision (The World Bank's Enterprise Surveys, 2023).

The datasets employed for this analysis consist of 28 variables and 1 151 unique firms in Nigeria from 2013 to 2015, 1 271 in Kenya from 2016 to 2018, and 673 in South Africa from 2017 to 2019, and they capture variation in variables for different firms. Missing values are dealt with through observation deletion. This reduces the Nigerian sample to 1 126, 1 265 in Kenya and 673 in South Africa. In the Nigerian sample, 829 firms registered in the year they started operation while 297 were unregistered at some point, 26 of which had not registered by the end of the sample period. In Kenya, 1164 firms registered in the year they started operation, 101 spent time unregistered, 3 of which had not registered by the end of the sample period. 638 South African firms registered immediately, of the 35 that spent time unregistered, 1 of which had not registered by the end of the sample period.

These numbers support the postulation by Cangul, Jonelis and Medina (2017,) which states that South Africa has one of the smallest informal economies in Sub-Saharan Africa, Nigeria has one of the largest and Kenya is somewhere in between (Cangul, Jonelis, & Medina, 2017). For South Africa, it is important to note that 48% of the entities began operating during apartheid, pre-1980. The implication

is that firms owned and run by white South Africans pre-1980 would have operated under a different institutional context and faced distinct constraints and liberties (South African Government, 2021). The benefits enjoyed by these firms may have enabled and catapulted their success. For the three countries, the variables specified in the model are assumed to be independent of treatment.

The dependent variable is “employment productivity growth” over the last three years. This is a derived variable, expressing the growth rate of permanent full-time workers. The key independent variable is “Years Without Registration”, this is a derived continuous variable which answers “How many years did an establishment spend unregistered from when it began operations?”. This is computed by subtracting the year the firm was registered from the year the firm began operations. A value of 0 indicates that the firm registered when it began operations. In measuring whether the employment productivity growth of a firm is correlated with the time it spends unregistered, it is necessary to control for known key determinants of firm performance.

The covariates in the model are limited to variables that have been shown to significantly influence firms’ performance. The liabilities of newness perspective postulated by Stinchombe (1965) requires firm age to be controlled for. Firm age is a continuous variable which outlines the number of years since a firm was established (this controls for firms’ natural trajectory that is unrelated to registration status). Firm age accounts for productivity gains as firms mature and become more efficient. This control isolates the impact of other factors on employment productivity growth over time.

According to a study by Ede (2021), firm size is significant in explaining firm performance as firms experience institutional obstacles at different levels of severity based on their size (Williams, Martinez-Perez, & Kedir, 2017; Ede, 2021). This is consistent with the findings by Ibhagui and Olokoyo (2018), who found that evidence of a negative effect on performance diminishes as firms grow, eventually vanishing when firm size exceeds the threshold level estimated in their study (Ibhagui & Olokoyo, 2018). As a result, we control for firm size as a categorical consisting of 1) Small - firms with less than 20 employees 2) Medium - Firms with between 20 and 99 employees, and 3) Large - firms with over 100 employees.

Certain legal entities like sole proprietorships are more likely to be registered than others (La Porta & Shleifer, 2008), to control for this Legal status is controlled for as a categorical variable. Ownership

structure has varying impacts on firm performance and is controlled for as a categorical variable. Finance is strongly correlated with firm performance and firms with access to finance tend to experience higher growth over time. Access to finance is a particular challenge to firms in developing countries and is often inaccessible to non-registered firms (Amaral & Quintin, 2006). The results mirror those of Fowowe (2017), who also found that firms that have access to credit experience faster growth, emphasising the importance of financing for firm growth (Fowowe, 2017). We control for this as a dummy variable with 1 indicating access is included in the analysis.

Due to international legislature, firms whose sales are made up of at least 1% direct exports are more likely to experience higher growth rates over time (La Porta & Shleifer, 2008). To control for this a dummy variable for export orientation is introduced. Human capital factors are significant as firms with women shareholders and experienced managers tend to experience higher growth rates over time (La Porta & Shleifer, 2014). Women's ownership of firms is included as a human capital dummy variable, while managers' years of experience are a continuous variable.

11 dummy variables represent the wider business environment. The variables indicate whether the factors are major constraints to firm activities, they are made significant by their potential to impact the cost of doing business and the firm's productivity. The factors are theft, land ownership, financing, taxation, tax administration, licensing, politics, corruption, the courts, and labour regulation. Firm registration leads to institutional awareness of the entrepreneurs' activities. Entrepreneurs are then obligated to comply with regulatory requirements (i.e., labour laws, pollution controls, health and safety standards, etc.) and pay appropriate taxes to avoid penalties, imprisonment, and/or termination of their ventures. Formal institutional inefficiencies or resource misallocations by formal institutions arise where formal institutions seek to protect or maximize economic rents for elites. This is done through overly burdensome taxes, registration and licensing regulations and costs which act as an entry barrier to formality for new entrepreneurs (Williams, Martinez-Perez, & Kadir, *Informal Entrepreneurship in Developing Economies: The Impacts of Starting Up Unregistered on Firm Performance*, 2017). In developing countries, entrepreneurs perceive policymakers as spending tax revenues as well as revenue generated from firm registration costs on other groups or wasting them (Bruton, Webb, & Siqueira, 2016). Ineffective legal frameworks, inconsistent law enforcement and government corruption produce higher transaction costs for firms operating in that economy (Saka-Helmhout, Chappin, & Vermeulen, 2020).

## 2.2 Model Specification

This paper investigates whether the number of years without registration impacts subsequent employment productivity growth through three hypotheses which are outlined below.

1. The relationship between years without registration and employment productivity growth is heterogeneous across countries
2. The relationship between years spent unregistered and employment productivity growth is non-linear.
3. The non-linear relationship between years spent unregistered and employment productivity growth is heterogeneous across developing countries.

Under the second hypothesis, we propose that there is a non-linear relationship between years spent unregistered and employment productivity growth. The third hypothesis considers the non-linear relationship at the country level and considers that if a quadratic relationship exists, then there must exist a certain point in time where the benefits from staying unregistered start to diminish marginally the longer a firm remains unregistered. Given the importance of institutional context in the registration decision, this optimal registration point would be heterogeneous across developing countries (Williams, Martinez-Perez, & Kedir, 2017).

**Hypothesis 1:** The relationship between years without registration and employment productivity growth is heterogeneous across countries

In investigating this hypothesis, we follow Williams, Martinez-Perez, and Kedir (2017) conducting an OLS regression on a dataset which aggregates developing countries (Kenya, Nigeria and South Africa). The data is analysed using linear multivariate regression analysis. Multivariate regression allows us to analyse the relationship between years spent unregistered on firm employee productivity growth and determine if it is statistically significant while holding other independent variables constant (Mooi & Sarstedt, 2014). Years without registration and registered at start are included, as specified by Williams et al. (2017). This approach is employed to capture the distinct effects of initial registration status and the duration of informality on firm performance (Williams et al., 2017). The linear model specified is in the form below:

$$y_i = \alpha + \theta w_i + \beta x_i + \varepsilon_i; \quad i = 1, \dots, N \quad \text{Equation 1}$$

Where:  $y_i$ : is the dependent variable Employment Productivity Growth

$\alpha$ : is the constant

$\theta$ : is the slope coefficient for Years without registration

$w_i$ : is the independent variable of interest- Years without Registration

$\beta$ : is a vector of covariate coefficients

$x_i$ : is a vector of covariates

$\varepsilon_i$ : is the idiosyncratic error term.

$i$ : indexes the individual firm

**Hypothesis 2:** The relationship between years without registration and employment productivity growth is non-linear

This country-level regression is different from that of Williams, Martinez-Perez, and Kedir (2017), who leverage linear multilevel regression in their analysis because they have aggregated 127 countries and clustered across country-year sub-levels (Williams, Martinez-Perez, & Kedir, 2017). This hypothesis extends their analyses by testing whether the relationship between employment productivity growth and years spent unregistered is indeed linear. This analysis will be conducted using the quadratic model specified below:

$$y_i = \alpha + \theta w_i + \lambda w_i^2 + \beta x_i + \varepsilon_i; \quad i = 1, \dots, N \quad \text{Equation 2}$$

Where:  $y_i$ : is the dependent variable Employment Productivity Growth

$\alpha$ : is the constant

$\theta$ : is the slope coefficient for Years without registration

$w_i$ : is the independent variable of interest- Years without Registration

$\lambda$ : is the slope coefficient for Years without registration<sup>2</sup>

$w_i^2$ : is the squared independent variable of interest- Years without Registration<sup>2</sup>

$\beta$ : is a vector of covariate coefficients

$x_i$ : is a vector of covariates

$\varepsilon_i$ : is the idiosyncratic error term.

$i$ : indexes the individual firm

The turning point indicates the number of years a firm can spend unregistered before the returns from remaining unregistered begin to diminish. The inflection point can be estimated by including square terms for years without registration and estimating the turning point as deduced from *Equation 2*.

$$Y_i = \theta w_i + \lambda w_i^2 + \varepsilon;$$
$$\text{turning point} = -(\theta) / (2 * \lambda)$$

**Equation 3**

**Hypothesis 3:** The non-linear impact of years spent unregistered on employment productivity growth is heterogeneous across developing countries

The distinctness of institutions- both formal and informal across developing countries requires that we extend hypothesis 2 by disaggregating the non-linearity postulation across Kenya, Nigeria, and South Africa (Pedroni, Pesce, & Briozzo, 2022; Assenova & Sorenson, 2017). The models of the countries are specified according to *Equation 2*.

### 3. Results and Implications

1 126, 1 265 and 673 private sector firms were sampled through the analysis in Nigeria, Kenya, and South Africa respectively. The percentage of firms that did not register when they began operations was 26.4 in Nigeria, which is significantly greater than the developing country's average of 10.2% (Williams, Martinez-Perez, & Kadir, 2017). South Africa and Kenya align with expectations by being lower than the developing country average, with 5.2-8% of firms not having registered when they began operations respectively.

Developing countries are subject to distinct socioeconomic conditions and institutions which create unique business environments. The International Labour Organization (2017) classifies Nigeria as a lower-middle income country, Kenya as low-income and South Africa as an upper-middle income country. As a result, deductions cannot be made about the relationship between years spent unregistered and employment productivity growth without considering the countries in isolation (Parnell & Pieterse, 2014; The International Labour Organization, 2017). The International Labour Organization (2017) states that the size of the informal economy as a proportion of GDP tends to be

larger in oil-exporting and fragile Sub-Saharan states, of which Nigeria is the former. They estimate that during 2010-2014, The informal economy as a proportion of GDP was 20-30% in South Africa, 30-40% in Kenya and above 50% in Nigeria which is consistent with the deductions from our data (The International Labour Organization, 2017).

**Hypothesis 1:** The relationship between years without registration and employment productivity growth is heterogeneous across countries

**Table 1**

**Developing Country Linear Regression**

	<i>Dependent variable:</i>
	Employment Productivity Growth
Years without registration	0.02*
Standard errors (s.e)	(0.01)
Registered at start	-0.3**
s.e	(0.1)
Kenya	-0.2*
s.e	(0.1)
Nigeria	0.1
s.e	(0.2)
South Africa	
s.e	
Constant	0.9***
s.e	(0.3)
$x_i$	<i>Vector of covariates controlled for</i>

Observations	3,043
R <sup>2</sup>	0.05
Adjusted R <sup>2</sup>	0.04
Residual Std. Error	1.8 (df = 3010)
F Statistic	4.6*** (df = 32; 3010)

Notes: \*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

The results in Table 1 outline the relationship between years spent unregistered and employment productivity growth is significant at the 10 percent level of significance and positive, which is in alignment with the work by Williams, Martinez-Perez, and Kedir (2017).

**Table 2**

**Country-Level Linear Regression**

	Employment Productivity Growth		
	Kenya	Nigeria	South Africa
Years without registration	0.01*	0.03	0.004
s.e	(0.01)	(0.03)	(0.03)
Registered at start	-0.2***	-0.3	0.1
s.e	(0.1)	(0.2)	(0.1)
Constant	0.6***	0.7	0.3**
s.e	(0.1)	(0.6)	(0.1)
$x_i$	<i>Vector of covariates controlled for</i>	<i>Vector of covariates controlled for</i>	<i>Vector of covariates controlled for</i>
<i>N</i>	1,264	1,111	668
$R^2$	0.1	0.1	0.1
Adjusted $R^2$	0.04	0.04	0.1
Residual Std. Error	0.6 (df = 1236)	2.8 (df = 1080)	0.5 (df = 641)
F Statistic	2.8*** (df = 27; 1236)	2.4*** (df = 30; 1080)	2.7*** (df = 26; 641)

Notes:

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

In Table 2, we extend the analysis of Williams, Martinez-Perez, and Kedir (2017) by considering whether the relationship between years spent unregistered and employment productivity growth is

heterogeneous across countries, as suggested by institutional theory. Table 2 reveals that once other firm-level determinants of employment productivity growth are controlled for with the same specification as that in Table 1, formal enterprises that spent more years unregistered in Kenya have an average employment productivity growth rate of 0.01 percentage points higher per year than firms that spend less time unregistered at a 10 percent level of significance. For Nigeria and South Africa, the relationship is not significant indicating that other firm-level determinants of employment productivity growth are controlled for. This result is not surprising and supports the hypothesis that there may be heterogeneity across countries. This postulation is supported by institutional theory, which suggests that there is a correlation between informality and institutions, whose magnitude is influenced by the size of the informal sector (Galdino, Molina-Sieiro, Lamont, & Holmes Jr, 2023; The International Labour Organization, 2017).

The results replicate Williams, Martinez-Perez, and Kedir (2017) in that the results are positive for each country, but there is heterogeneity across the countries in terms of the significance of the variables. In countries where the institutional quality is poor, firms are encouraged to not only start unregistered but also to remain informal as firms spend more of their resources dealing with unpredictable obstacles (Galdino, Molina-Sieiro, Lamont, & Holmes Jr, 2023; The National Treasury of Kenya, 2023). This argument is supported in Table 2, where Kenya only has corruption as a significant obstacle and when we consider the countries that do not have years spent unregistered as significant in explaining employment productivity growth, Nigeria, and South Africa both have two of the obstacles significant.

**Hypothesis 2:** The relationship between years without registration and employment productivity growth is non-linear

**Table 3**

**Developing Country Non-Linear Regression**

	<i>Dependent variable:</i>
	Employment Productivity Growth
Years without registration	0.1**
s.e	(0.02)
Years without registration^2	-0.001*

s.e	(0.001)
Kenya	-0.2*
s.e	(0.1)
Nigeria	0.1
s.e	(0.2)
South Africa	
s.e	
Constant	0.8***
s.e	(0.3)

$x_i$  *Vector of covariates controlled for*

Observations	3,043
R <sup>2</sup>	0.05
Adjusted R <sup>2</sup>	0.04
Residual Std. Error	1.8 (df = 3009)
F Statistic	4.5*** (df = 33; 3009)

*Note:* \*\*\*Significant at the 1 percent level.  
\*\*Significant at the 5 percent level.  
\*Significant at the 10 percent level.

According to the results in Table 3, when specifying a quadratic model, the significance of years without registration increases from 10 to 5 percent levels of significance. The quadratic term is also significant at the 10 percent level. Consistent with the results in Table 1, the relationships between employment productivity growth and the developing countries “Kenya”, “Nigeria” and “South Africa” are heterogeneous in terms of significance and directionally.

### ***Developing Countries***

Leveraging *Equation 3*, we find that the gains from staying unregistered on employment productivity growth begin to diminish after 27.3 years. In Table 3, Years without registration<sup>2</sup> decreases employment productivity growth at a rate of 0.001 percentage points per year. This result must be disaggregated at the country level, as we have already outlined that institutional variations among developing countries influence firm performance (Galdino, Molina-Sieiro, Lamont, & Holmes Jr,

2023). Formal institutions in developing countries impose restrictions on their informal sectors which are informed by the size of the sector, economic performance and socio-economic contexts leading to heterogeneous outcomes. The failures of the formal institutions give greater importance to informal forms, which are made up of values, beliefs and values which define socially acceptable behaviours which are rarely transferred beyond the country context in which they exist (Pedroni, Pesce , & Briozzo, 2022).

**Hypothesis 3:** The non-linear impact of years spent unregistered on employment productivity growth is heterogeneous across developing countries

**Table 4**

**Country Level Non-Linear Regression**

	Employment Productivity Growth		
	Kenya	Nigeria	South Africa
Years without registration	0.1***	-0.01	0.02
s.e	(0.01)	(0.1)	(0.1)
Years without registration <sup>2</sup>	-0.001***	0.01	-0.002
s.e	(0.000)	(0.01)	(0.01)
Registered at start	-0.1	-0.3	0.1
s.e	(0.1)	(0.3)	(0.2)
Constant	0.5***	0.7	0.3
s.e	(0.1)	(0.6)	(0.2)
$x_i$	<i>Vector of covariates controlled for</i>	<i>Vector of covariates controlled for</i>	<i>Vector of covariates controlled for</i>
$N$	1,264	1,111	668
$R^2$	0.1	0.1	0.1
Adjusted $R^2$	0.04	0.04	0.1
Residual Std. Error	0.6 (df = 1235)	2.8 (df = 1078)	0.5 (df = 640)

F Statistic	3.1*** (df = 28; 1235)	2.3*** (df = 32; 1078)	2.6*** (df = 27; 640)
Notes:	***Significant at the 1 percent level.		
	**Significant at the 5 percent level.		
	*Significant at the 10 percent level.		

According to the results in Table 4, when specifying a quadratic model, the significance of years without registration increases from 10 to 1 percent levels of significance for Kenya, the quadratic term is also significant at a 1 percent level of significance. Nigeria and South Africa are consistent in that the relationship between years spent unregistered and employment productivity growth remains non-significant. This reasserts the postulation that there is heterogeneity among developing countries with this relationship (Galdino, Molina-Sieiro, Lamont, & Holmes Jr, 2023; Assenova & Sorenson, 2017; Matwere & Mwami, 2019).

Corruption is considered one of the most significant institutional failures, particularly in Sub-Saharan Africa (Matwere & Mwami, 2019; Galdino, Molina-Sieiro, Lamont, & Holmes Jr, 2023), so it is worth noting that it is significant for Nigeria and Kenya in Table 4. Particularly as Nigeria is ranked as one of the most corrupt countries in the world (Atitianti & Chikelu, 2021). Atitianti and Chikelu (2021) found that corruption in the form of informal payments hinders firm growth in Nigeria substantially.

### ***Kenya***

According to Table 4, this relationship between staying unregistered on employment productivity growth is significant for Kenya, and through Equation 3 we find that the gains from years spent unregistered begin to diminish after 30.9 years, which is a considerably large period. This is not only the result of Kenya being a low-income country, but it is also due to multiple institutional inefficiencies such that even when a firm does want to register the procedure is cumbersome (Matwere & Mwami, 2019; The National Treasury of Kenya, 2023).

The institutions in Kenya are not adequately resourced and they are often given multiple mandates, which prevents them from discharging their duties. Adding to this, the country is behind in terms of legislature governing the informal sector. The first law that comprehensively addressed informal firms was only passed in 2012, the act addressed multiple issues chief of which being the establishment of a

registrar to register and regulate small and medium-sized firms (Matwere & Mwami, 2019). Unfortunately, establishing the institutions takes long periods, as of 2017 there had been no allocation of funding by parliament to pass the act which impedes growth and development in the sector and may explain why the returns from years spent unregistered on employment productivity growth only begin to diminish after a full generation (Williams, Martinez-Perez, & Kedir, 2017; Matwere & Mwami, 2019).

### ***Nigeria***

According to Table 4, the relationship between years spent unregistered and employment productivity is not significant. There are two elements of institutional theory put forward in the analysis by Pedroni, Pesce and Briozzo (2022) which may be of relevance to Nigeria. The first theory considers the emergence of the informal theory as a result of imperfections in the enforcement of formal institution regulations (Pedroni, Pesce, & Briozzo, 2022). Adogamhe (2008) classifies Nigeria as a rentier state based on the economy's reliance on substantial external rent which enables them to survive without a strong formal domestic productive sector. The government depends on oil revenue and discharges itself from the need to extract taxes from the domestic economy for wealth creation. This not only diminishes existing institutions in the form of government's administrative capacity; it also diminishes entrepreneurs' incentive to formalise their businesses (Adogamhe, 2008).

The second institutional theory states that formal institutional agents can further undermine efforts to regulate the informal sector due to personal interest and negligence (Pedroni, Pesce, & Briozzo, 2022). The Nigerian government often make policy commitments without producing documentation, which contributes to the distrust of institutions by informal entrepreneurs (Mamman, Eldridge, & Branine, 2001). Firms operating in Nigeria's formal economy have tended to suffer in the context of institutional voids, in contrast, to the informal sector which has flourished under similar conditions. Informal sector firms tend to build their businesses by providing services that are underserved due to the institutional voids. The voids are so significant that firms often prefer informal entrepreneurship rather than the formal sector (Anosike, Adike, & Wang, 2022)

### ***South Africa***

According to Table 4, this relationship between staying unregistered on employment productivity growth is not significant. South Africa has one of the smallest informal sectors in Sub-Saharan Africa,

which fits into the institutional theory that the relationship between formal and informal institutions influences the level of informality (Pedroni, Pesce , & Briozzo, 2022). This could be influenced not only by the fact that the country is considered an upper-middle-income country but also because of the symmetry between formal and informal institutions. The socially shared norms, values and beliefs of informal institutions are aligned with the codified laws and regulations of formal institutions (The International Labour Organization, 2017; Pedroni, Pesce , & Briozzo, 2022; Berman & Wicks, 2004).

#### **4. Limitations and Future Research**

The analysis does not account for sample selection bias; therefore, the effect of being unregistered at the start of operations may be conflated with the effect of years spent without registration. The analysis could be strengthened further by considering a fifth hypothesis - that the relationship between years spent unregistered and employment productivity growth is nonparametric (Assenova & Sorenson, 2017).

#### **5. Conclusion**

In deciding how long to stay unregistered, entrepreneurs make that decision taking into consideration the institutional context they operate in, and whether the benefits they stand to gain exceed the costs (Williams, Martinez-Perez, & Kedir, 2017; Assenova & Sorenson, 2017; Autio & Fu, 2015; Galdino, Molina-Sieiro, Lamont, & Holmes Jr, 2023). Developing countries such as Kenya, Nigeria and South Africa stand to benefit from building stronger and more inclusive institutions on existing frameworks (Saka-Helmhout, Chappin, & Vermeulen, 2020). Formal institutions do not always deliver on their mandate in a way that makes them more functional than social institutions (Adogamhe, 2008; Pedroni, Pesce , & Briozzo, 2022).

To investigate the relationship between years spent unregistered and employment productivity growth, we put together three hypotheses. In terms of hypothesis 1, we found that the relationship between years spent unregistered and employment productivity growth is heterogeneous across developing countries otherwise all three countries would have had a significant result of the same magnitude (Autio & Fu, 2015). Years spent unregistered did not impact any of the countries in the same way and institutionally, the arguments were not homogeneous across countries either. Hypothesis 2, the nonlinear relationship between years spent unregistered and employment productivity growth was significant at the 1% level of significance, therefore this hypothesis is also true that the relationship

between employment productivity growth is not consistent over time if a firm does not register. The non-linear impact of years spent unregistered on employment productivity growth is heterogeneous across developing countries, as per hypothesis 3. These hypotheses tell us that institutional environmental differences across developing countries play a significant role in determining the outcomes of firms and their decisions on when to register (Anosike, Adike, & Wang, 2022; La Porta & Shleifer, *Informality and development.*, 2014).

We conclude that it may be illogical to expect start-up businesses in Kenya, Nigeria and South Africa to tend toward formalising their businesses without considering the distinct institutional context. Businesses opting out of registration when they begin operations incur costs due to the liabilities of newness, however, they may also experience other liabilities that they need to mitigate over time (Matwere & Mwami, 2019; Adogamhe, 2008; Ede, 2021). Looking forward to SDG 8 and the increased youth population on the continent institutions become of particular importance to policymakers looking to grow economies and create employment opportunities (United Nations, 2023).

## Bibliography

- A.G. Aguilar, E. C. (2009). Informal Sector. *International Encyclopedia of Human Geography*, 446-453.
- Adewusi, A., Mair, J., & Uzo, U. (2023, January 31). How firms strategically navigate informal and formal copyright practices: insights from Nollywood. *International Journal of Organizational Analysis*, 31(2), 508-532.
- Adogamhe, P. G. (2008). REFORMING THE RENTIER STATE: THE CHALLENGES OF GOVERNANCE REFORMS IN NIGERIA. *The Journal of Energy and Development* , 227-252.
- Amaral, P. S., & Quintin, E. (2006). A competitive model of the informal sector. *Journal of Monetary Economics*, 1541-1553.
- Anosike, P. U., Adike, A. J., & Wang, Y. (2022). Two-sided Institutional Impacts and Informal Entrepreneurship Motivation in Nigeria. *Journal of Entrepreneurship and Innovation in Emerging Economies*, 8(1), 158-175.
- Assenova, V. A., & Sorenson, O. (2017). Legitimacy and the Benefits of Firm Formalization. *Organization Science*, 28(5), 804-818.
- Atitianti, P. A., & Chikelu, J. C. (2021, April 26). Corruption and firm growth: evidence from Nigeria. *SN Business & Economics*, 1(66).
- Autio, E., & Fu, K. (2015). Economic and Political Institutions and Entry into Formal and Informal Entrepreneurship. *Asia Pacific Journal of Management*, 67-94.
- Barasa, L., Knobon, J., Vermeulen, P., Kimuyu, P., & Kinyanjui, B. (2017, February). Institutions, resources and innovation in East Africa: A firm level approach. *Research Policy*, 46(1), 280-291.
- Beall, J. &. (2009). *Cities and Development*. Routledge.
- Bennett, J. (2010). Informal Firms in Developing Countries: Entrepreneurial Stepping Stone or Consolation Prize? *Small Business Economics*, 34(1), 53-63.
- Berman, S. L., & Wicks, A. C. (2004, January). The Effects of Context on Trust in Firm-Stakeholder Relationships: The Institutional Environment, Trust Creation, and Firm Performance. *Business Ethics Quarterly*, 14(1), 141-160.
- Botha, F., & Ezeoha, A. (2012, January). Firm age, collateral value, and access to debt financing in an emerging economy: evidence from South Africa. *South African Journal of Economic and Management Sciences*, 51(1).

- Bruton, G. D., Webb, J. W., & Siqueira, A. O. (2016). Informal Entrepreneurship and Industry Conditions. *Entrepreneurship Theory and Practice*, 177-200.
- Business Insider Africa. (2022, February 24). Nigeria, South Africa, Kenya among Top 5 African countries with the most developed startup ecosystems – report. *Business Insider Africa*.
- Cangul, M., Jonelis, A., & Medina, L. (2017, July). The Informal Economy in Sub-Saharan Africa: Size and Determinants. *IMF Working Paper 17/156*, p. 13.
- Central Bank of Nigeria. (2023, 05 01). *Access to Finance*. Retrieved from Central Bank of Nigeria: <https://www.cbn.gov.ng>
- Charmes, J. (2016). The Informal Economy: Definitions, Size, Contribution and Main Characteristics. In E. Kraemer-Mbula, & S. Wunsch-Vincent, *The Informal Economy in Developing Nations: Hidden Engine of Innovation?* (pp. 13-53). Cambridge University Press.
- Council on Foreign Relations. (2023, 10 28). *Regions of the world*. Retrieved from Sub-Saharan Africa: <https://world101.cfr.org/rotw/africa/geopolitics#african-union-provides-imperfect-forum-for-regional-cooperation>
- Doh, J. P., Newbert, S. L., & LiPuma, J. A. (2013). The Effect of Institutional Quality on Firm Export Performance in Emerging Economies: A Contingency Model of Firm Age and Size. *Small Business Economics*, 40(4), 817-841.
- Ede, O. C. (2021). Obstacles to firm performance in Nigeria: does size matter? *Journal of Small Business & Entrepreneurship*, 33(1), 49-70.
- Fowowe, B. (2017, June). Access to finance and firm performance: Evidence from African countries. *Review of Development Finance*, 7(1), 6-17.
- Galdino, K. M., Molina-Sieiro, G., Lamont, B. T., & Holmes Jr, R. M. (2023). Factor markets, institutional quality and firm formalisation: The contingent effect of economic conditions at the founding stage. *International Small Business Journal: Researching Entrepreneurship*, 41(4), 432-461.
- Gërzhani, K. (2004). The Informal Sector in Developed and Less Developed Countries: A Literature Survey. *Public Choice*, 120(3), 67-300.
- Government of Kenya . (2023, 01 01). *Access to Government Procurement Opportunities (AGPO)*. Retrieved from Government of Kenya: <https://www.agpo.go.ke>
- Ibhagui, O. W., & Olokoyo, F. O. (2018, July). Leverage and firm performance: New evidence on the role of firm size. *The North American Journal of Economics and Finance*, 45, 57-82.
- International Labour Organization. (2022, May). *Informal Economy in Africa: Which Way Forward?*

- Making Policy Responsive, Inclusive and Sustainable*. Retrieved from ilo.org:  
[https://www.ilo.org/africa/events-and-meetings/WCMS\\_842679/lang--en/index.htm](https://www.ilo.org/africa/events-and-meetings/WCMS_842679/lang--en/index.htm)
- International Labour Organization. (2023, August 18). *ILO home Topics Decent work for sustainable development (DW4SD) Resource Platform Thematic areas 13. Informal Economy*. Retrieved from ilo.org: <https://www.ilo.org/global/topics/dw4sd/themes/informal-economy/lang--en/index.htm>
- Jutting, J., & Laiglesia, J. (2009). Employment, Poverty Reduction and Development. In J. Jutting, & J. Laiglesia, *Is Informal Normal? Towards More and Better Jobs in Developing Counties* (pp. 129-152). Paris: OECD.
- Ketchen Jr, D. J., Ireland, R. D., & Bruton, G. D. (2012). Toward a Research Agenda on the Informal Economy. *Academy of Management Perspectives*, 26(3), 1-11.
- Khwaja, M., Cleary, D., Misch, F., & Dabla-Norris, E. (2017, April 17). Tax Administration and Firm Performance: New Data and Evidence for Emerging Market and Developing Economies. *IMF Working Paper*, 2017(095).
- Kistruck, G. M., Grogan–Kaylor, A., Esper, H., & London, T. (n.d.). Connecting Poverty to Purchase in Informal Markets. *Strategic Entrepreneurship Journal*, 8(1), 37-55.
- KRA. (2023, 09 09). *Tax Incentives for SMEs*. Retrieved from Kenya Research Authority: <https://www.kippra.or.ke>
- La Porta, R., & Shleifer, A. (2008). The unofficial economy and economic development. *Brookings Papers on Economic Activity*, 123-135.
- La Porta, R., & Shleifer, A. (2014). Informality and development. *Journal of Economic Perspectives*, 109-126.
- Ma, Y., & Zhao, G. (2016, February). Robust nonparametric kernel regression estimator. *Statistics and Probability Letters*, 116, 72-79.
- Mamman, A., Eldridge, D., & Branine, M. (2001). Skills Needs Of SMEs And The Informal Sector In Africa: Problems and Prospects for Employment Creation in Nigeria. *Scientific Journal of Administrative Development*, 145-177.
- Mansury, M. A., & Love, J. H. (2008). Innovation, productivity and growth in US business services: A firm-level analysis. *Technovation*, 52-62.
- Martin, & Magidi, M. (2021). The role of the informal economy in promoting urban sustainability: Evidence from a small Zimbabwean town. *Development Southern Africa*.
- Matwere, M., & Mwami, M. (2019). Assessment of institutional structures governing the Informal

- Sector in Kenya. *The Kenya Institute for Public Policy Research and Analysis*, 227, pp. 12-20.
- Mendi, P., & Mudida, R. (2018, June). The effect on innovation of beginning informal: Empirical evidence from Kenya. *Technological Forecasting and Social Change*, 131, 326-335.
- Mkandawire, T. (2010). From maladjusted states to democratic developmental states in Africa. In O. Edigheji (Ed.), *Constructing a Democratic Developmental State in South Africa: Potentials and Challenges* (pp. 59-78). Cape Town: HSRC Press.
- Mkandawire, T. (2010). On Tax Efforts and Colonial Heritage in Africa. *Journal of Development Studies*, 46(10), 1647-1669.
- Mooi, E., & Sarstedt, M. (2014). Regression Analysis. In E. Mooi, & M. Sarstedt, *A Concise Guide to Market Research* (pp. 193-233). Springer .
- Naudé, W. (2018). *Entrepreneurship and Economic Development: Theory, Evidence and Policy*. IZA World of Labor.
- Nigeria Investment Promotion Commission. (2023). *Business Incentive Strategy*. Retrieved from Nigeria Investment Promotion Commission: <https://www.nipc.gov.ng>
- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- Odera, L. C. (2013). The Role of Trust as an Informal Institution in the Informal Sector in Africa. *Africa Development*, 121-146.
- Odera, O. (2013). The Informal Sector in Sub-Saharan Africa: A Comparative Study of Kenya and South Africa. *African Journal of Business Management*, 7(35), 3535-3543.
- Olawale, F. (2020). Regulatory Environment and Business Performance in Nigeria. *Journal of Business and Management*, 22(3), 45-54.
- Parnell, S., & Pieterse, E. (2014). Africa's urban revolution in context. In *Africa's urban revolution* (pp. 1-18). London, New York: Zed Books.
- Pedroni, F. V., Pesce, G., & Briozzo, A. (2022). Why do Firms Operate Informally? Insights from a Systematic Literature Review. *Innovar*, 32(83), 121-138.
- Pieterse, E., & Smit, W. (2014). Decentralisation and institutional reconfiguration in urban Africa. *Africa's urban revolution*, 148-166.
- Pletcher, K. (2023, December 1). *Britannica*. Retrieved from Geography and Travel: Kisumu: <https://www.britannica.com/place/Kisumu#:~:text=Kisumu%20is%20an%20important%20link,%20brewing%20and%20textile%20manufacturing>.

- Rogerson, C. M. (2018). Informal Sector Enterprise Development in South Africa: The Role of Local Government. *Local Economy*, 33(4), 438-455.
- Saka-Helmhout, A., Chappin, M., & Vermeulen, P. (2020). Multiple Paths to Firm Innovation in Sub-Saharan Africa: How informal institutions matter. *Organization Studies*, 41(11), 1551-1575.
- Schneider, F., & Williams, C. C. (2013). The Shadow Economy. *London Institute of Economic Affairs*.
- Scott, W. R. (2008). *Institutions and Organizations: Ideas and Interests*. Sage Publications.
- Serumaga-Zake, P. A., & Naudé, W. A. (2003). Firm Size, Efficiency and Exports: Empirical Evidence from South Africa. *Journal of Small Business & Entrepreneurship*, 16(3-4), 67-79.
- Shleifer, A., & La Porta, R. (2014). Informality and Development. *The Journal of Economic Perspectives*, 28(3), 109-126.
- South African Government. (2021, September 4). *Land Reform*. Retrieved from South African Government: <https://www.gov.za/issues/land-reform>
- South African Government. (2023)). *Black Economic Empowerment (BEE)*. Retrieved from <https://www.gov.za>
- South African Revenue Services. (2023). *Small Business Tax Incentives*. Retrieved from SARS: <https://www.sars.gov.za>
- Stinchombe, A. L. (1965). Social structure and organizations. In J. G. March, *Handbook of Organizations* (pp. 142-193). Chicago: Rand McNally.
- The International Labour Organization. (2017, April). HE INFORMAL ECONOMY IN SUB-SAHARAN AFRICA . *Regional Economic Outlook: Sub-Saharan Africa (REO)*, pp. 49-68.
- The National Treasury of Kenya. (2023, 11 3). *Information & Services: The Kenyan Economy*. Retrieved from The Kenyan Economy: <https://www.treasury.go.ke/kenya-economy/>
- The World Bank. (2022). Chapter 5 Informality in Emerging Market and Developing Economies: Regional Dimensions. In T. W. Bank, S. Yu, & F. Ohnsorge (Eds.), *The Long Shadow of Informality: Challenges and Policies* (pp. 234-242). Washington DC: The World Bank.
- The World Bank. (2022). *Informal Economy in Sub-Saharan Africa*. Retrieved from <https://www.worldbank.org>
- The World Bank's Enterprise Surveys. (2023, July 28). *Methodology: Enterprise Surveys*. Retrieved from Enterprise Surveys: <https://www.enterprisesurveys.org/content/dam/enterprisesurveys/documents/methodology/S>

ampling\_Note-Consolidated-2-16-22.pdf

Ulysea, G. (2020). Informality: Causes and Consequences for Development. *Annual Review of Economics*, 12, 525-546.

United Nations. (2023, 17 August). *SDG Goals/ Goal 8*. Retrieved from SDG Goals:  
<https://sdgs.un.org/goals/goal8>

Ventresca, M. J., Marti, I., & Mair, J. (2012). Building Inclusive Markets in Rural Bangladesh: How Intermediaries Work Institutional Voids. *Academy of Management Journal*, 55(4), 19-850.

Vermeulen, P., Chappin, M., & Saka-Helmhout, A. (n.d.). Multiple Institutional Logics in the Informal Economy: Institutional Work of Food Vendors in Kenya. *Journal of Business Ethics*, 161(4), 759-777.

Williams, C. C. (2015). Explaining the Informal Economy: an Exploratory Evaluation of Competing Perspectives. *Relations Industrielles / Industrial Relations*, 70(4), 741-765.

Williams, C. C., Martinez-Perez, A., & Kedir, A. M. (2017, September). Informal Entrepreneurship in Developing Economies: The Impacts of Starting Up Unregistered on Firm Performance. *Entrepreneurship Theory and Practice*, pp. 1042-257.

## Appendix

Table A0 defines and describes the variables used. Tables A1, A2 and A3 outline the descriptive statistics for Nigeria, Kenya, and South Africa respectively.

### A0: Variable Definition and Description

Variable	Description
Registered at start	Indicates whether the firm was formally registered when it started operations. Categories: Yes, No.
Years without registration	The number of years the firm operated without formal registration.
Firm age	The number of years since the firm was established.
Government contract	Indicates whether the firm has secured contracts with the government. Categories: Yes, No.
Size at inception	The initial size of the firm, measured by the number of employees at the start.
State ownership	Indicates if the firm is owned by the state. Categories: Yes, No.
Domestic ownership	Indicates if the firm is domestically owned. Categories: Yes, No.
Female owner	Indicates if the firm is owned by a female. Categories: Yes, No.
Export	Indicates whether the firm exports directly or indirectly (at least 10% of sales). Categories: Yes, No.
Export zone	Indicates if the firm is located in an export processing zone. Categories: Yes, No.
Credit line	Indicates whether the firm has a line of credit or a loan from a financial institution. Categories: Yes, No.
Credit working capital	Indicates if the firm uses credit to finance its working capital. Categories: Yes, No.
Other credit working capital	Indicates if the firm uses other sources of credit to finance its working capital. Categories: Yes, No.

Managers years of experience	The number of years of experience the top manager has in the firm's sector.
Fulltime temporary worker	The number of full-time temporary workers employed by the firm.
Fulltime permanent worker	The number of full-time permanent workers employed by the firm.
Worker high school educated	The percentage of workers who have completed high school.
Audited financial statements	Indicates whether the firm's financial statements are audited by an external auditor. Categories: Yes, No.
Transport obstacle	The extent to which transportation issues are an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Electricity obstacle	The extent to which electricity supply issues are an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Website	Indicates if the firm has a website. Categories: Yes, No.
Informal	The extent of informal competition as an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Customs obstacle	The extent to which customs and trade regulations are an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Theft obstacle	The extent to which crime, theft, and disorder are an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Land obstacle	The extent to which access to land is an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.

Finance obstacle	The extent to which access to finance is an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Tax obstacle	The extent to which tax rates are an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Tax admin obstacle	The extent to which tax administration is an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
License obstacle	The extent to which business licensing and permits are an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Politics obstacle	The extent to which political instability is an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Corruption obstacle	The extent to which corruption is an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Courts obstacle	The extent to which functioning of the courts is an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Labour regulation obstacle	The extent to which labour regulations are an obstacle to the firm's operations. Categories: No obstacle, Minor obstacle, Moderate obstacle, Major obstacle, Very severe obstacle.
Part of a larger firm	Indicates if the firm is part of a larger firm. Categories: Yes, No.
HQ not located with sales and/or production	Indicates if the firm's headquarters is separate from its sales or production facilities. Categories: Yes, No.
HQ located with sales and/or production	Indicates if the firm's headquarters is co-located with its sales or production. Categories: Yes, No.

Firm not located with HQ, sales and/or production	Indicates if the firm operates separately from its headquarters, sales, or production locations. Categories: Yes, No.
Firm not located with HQ but with sales and/or production	Indicates if the firm operates its sales or production facilities separately from its headquarters. Categories: Yes, No.
Size at inception	The initial size of the firm, typically measured by the number of employees at the time the firm was first established. Categories: Micro (1-4 employees), Small (5-19 employees), Medium (20-99 employees), Large (100+ employees).
Product innovation	Indicates if the firm introduced new or significantly improved products or services. Categories: Yes, No.
Market innovation	Indicates if the firm implemented new marketing strategies or entered new markets. Categories: Yes, No.
Method innovation	Indicates if the firm adopted new methods or processes. Categories: Yes, No.
Logistic innovation	Indicates if the firm introduced innovations in logistics and supply chain management. Categories: Yes, No.
Support innovation	Indicates if the firm developed new support services or systems. Categories: Yes, No.
Organisational innovation	Indicates if the firm made changes in its organisational structure or management practices. Categories: Yes, No.
Marketing innovation	Indicates if the firm implemented new marketing techniques or strategies. Categories: Yes, No.
R&D innovation	Indicates if the firm invested in research and development. Categories: Yes, No.
Idea time	The amount of time allocated for generating and developing new ideas.
Outside the Main City	Indicates if the firm is located outside the main city. Categories: Yes, No.

Within the Main City	Indicates if the firm is located within the main city. Categories: Yes, No.
East region	Indicates if the firm operates in the eastern region. Categories: Yes, No.
North region	Indicates if the firm operates in the northern region. Categories: Yes, No.
West region	Indicates if the firm operates in the western region. Categories: Yes, No.
Shareholding company with shares traded in the stock market	Indicates if the firm is a shareholding company with shares traded in the stock market. Categories: Yes, No.
Shareholding company with non-traded shares or shares traded	Indicates if the firm is a shareholding company with non-traded shares or shares traded privately. Categories: Yes, No.
Sole proprietorship	Indicates if the firm is a sole proprietorship. Categories: Yes, No.
Partnership	Indicates if the firm is structured as a partnership. Categories: Yes, No.
Limited partnership	Indicates if the firm is a limited partnership. Categories: Yes, No.
Fabricated Metal Products sector	Indicates if the firm operates in the fabricated metal products sector. Categories: Yes, No.
Food & Beverage sector	Indicates if the firm operates in the food and beverage sector. Categories: Yes, No.
Furniture sector	Indicates if the firm operates in the furniture sector. Categories: Yes, No.
Garments sector	Indicates if the firm operates in the garments sector. Categories: Yes, No.
Non-metallic mineral sector	Indicates if the firm operates in the non-metallic mineral products sector. Categories: Yes, No.
Publishing sector	Indicates if the firm operates in the publishing sector. Categories: Yes, No.

Other Manufacturing sector	Indicates if the firm operates in other manufacturing sectors not specified. Categories: Yes, No.
Other services sector	Indicates if the firm operates in other service sectors not specified. Categories: Yes, No.
Repair & Sale of Motor vehicle sector	Indicates if the firm operates in the repair and sale of motor vehicles sector. Categories: Yes, No.
Wholesale sector	Indicates if the firm operates in the wholesale sector. Categories: Yes, No.
Hotel & Restaurant sector	Indicates if the firm operates in the hotel and restaurant sector. Categories: Yes, No.
Retail sector	Indicates if the firm operates in the retail sector. Categories: Yes, No.
Transport sector	Indicates if the firm operates in the transport sector. Categories: Yes, No.
Manufacturing Panel sector	Indicates if the firm is part of the manufacturing panel. Categories: Yes, No.
Retail Panel sector	Indicates if the firm is part of the retail panel. Categories: Yes, No.
Other Services Panel sector	Indicates if the firm is part of the other services panel. Categories: Yes, No.
Years_without_registration^2	The squared term of years without registration, capturing non-linear effects of non-registration duration on firm performance.

***A1: Descriptive Statistics Nigeria***

Statistic	N	Mean	St. Dev.	Min	Max
Registered at start	1,151	0.6	0.5	0	1
Years without registration	1,126	1.7	4.0	0	30
Firm age	1,151	15.2	10.1	2	115
Government contract	1,151	0.1	0.3	0	1

Size at inception	1,151	1.3	0.7	0	3
State ownership	1,151	0.004	0.1	0	1
Domestic ownership	1,151	0.8	0.4	0	1
Female owner	1,151	0.2	0.4	0	1
Export	1,151	0.2	0.4	0	1
Export zone	1,151	0.1	0.2	0	1
Credit line	1,151	0.1	0.3	0	1
Credit working capital	1,151	0.2	0.4	0	1
Other credit working capital	1,151	0.2	0.4	0	1
Managers years of experience	1,151	13.4	8.6	0.0	72.0
Fulltime temporary worker	1,151	4.7	38.0	0	955
Fulltime permanent worker	1,151	9.4	105.7	0	3,000
Worker high school educated	1,151	55.6	39.2	0.0	100.0
Audited financial statements	1,151	0.2	0.4	0	1
Transport obstacle	1,151	0.2	0.4	0	1
Electricity obstacle	1,151	0.5	0.5	0	1
Website	1,151	0.2	0.4	0	1
Informal	1,151	0.2	0.4	0	1
Customs obstacle	1,151	0.1	0.3	0	1
Theft obstacle	1,151	0.1	0.3	0	1
Land obstacle	1,151	0.2	0.4	0	1
Finance obstacle	1,151	0.3	0.4	0	1
Tax obstacle	1,151	0.2	0.4	0	1
Tax admin obstacle	1,151	0.2	0.4	0	1
License obstacle	1,151	0.1	0.3	0	1
Politics obstacle	1,151	0.3	0.4	0	1
Corruption obstacle	1,151	0.5	0.5	0	1
Courts obstacle	1,151	0.1	0.2	0	1
Labour regulation obstacle	1,151	0.1	0.2	0	1
Part of a larger firm	1,151	0.2	0.4	0	1

HQ not located with sales and/or production	1,151	0.2	0.4	0	1
HQ located with sales and/or production	1,151	0.3	0.4	0	1
Firm not located with HQ, sales and/or production	1,151	0.1	0.2	0	1
Firm not located with HQ but with sales and/or production	1,151	0.02	0.1	0	1
Size at inception	1,151	31.1	218.9	-9	5,000
Product innovation	1,151	0.6	0.5	0	1
Market innovation	1,151	0.4	0.5	0	1
Method innovation	1,151	0.6	0.5	0	1
Logistic innovation	1,151	0.6	0.5	0	1
Support innovation	1,151	0.5	0.5	0	1
Organizational innovation	1,151	0.5	0.5	0	1
Marketing innovation	1,151	0.6	0.5	0	1
R&D innovation	1,151	0.2	0.4	0	1
Idea time	1,151	0.5	0.5	0	1
Outside the Main City	1,151	0.6	0.5	0	1
Within the Main City	1,151	0.4	0.5	0	1
East region	1,151	0.2	0.4	0	1
North region	1,151	0.6	0.5	0	1
West region	1,151	0.2	0.4	0	1
Shareholding company with shares trade in the stock market	1,151	0.02	0.1	0	1
Shareholding company with non-traded shares or shares traded	1,151	0.03	0.2	0	1
Sole proprietorship	1,151	0.8	0.4	0	1
Partnership	1,151	0.1	0.3	0	1
Limited partnership	1,151	0.1	0.2	0	1
Fabricated Metal Products sector	1,151	0.1	0.2	0	1
Food & Beverage sector	1,151	0.1	0.2	0	1
Furniture sector	1,151	0.1	0.2	0	1

Garments sector	1,151	0.1	0.2	0	1
Non-metallic mineral sector	1,151	0.1	0.2	0	1
Publishing sector	1,151	0.1	0.2	0	1
Other Manufacturing sector	1,151	0.1	0.2	0	1
Other services sector	1,151	0.04	0.2	0	1
Repair & Sale of Motor vehicle sector	1,151	0.1	0.2	0	1
Wholesale sector	1,151	0.02	0.1	0	1
Hotel & Restaurant sector	1,151	0.04	0.2	0	1
Retail sector	1,151	0.05	0.2	0	1
Transport sector	1,151	0.04	0.2	0	1
Manufacturing Panel sector	1,151	0.1	0.3	0	1
Retail Panel sector	1,151	0.1	0.3	0	1
Other Services Panel sector	1,151	0.1	0.3	0	1
Years_without_registration^2	1,126	19.0	79.7	0	900

**A2: Descriptive Statistics Kenya**

Statistic	N	Mean	St. Dev.	Min	Max
Registered at start	1,271	0.9	0.3	0	1
Years without registration	1,265	0.5	3.1	0	69
Firm age	1,271	23.1	18.2	1	124
Government contract	1,271	0.2	0.4	0	1
Size at inception	1,271	1.8	0.8	1	3
State ownership	1,271	0.0	0.0	0	0
Domestic ownership	1,271	0.9	0.3	0	1
Female owner	1,271	0.5	0.5	0	1
Export	1,271	1.0	0.0	1	1
Credit line	1,271	0.4	0.5	0	1
Credit working capital	1,271	1.0	0.0	1	1
Other credit working capital	1,271	1.0	0.0	1	1
Managers years of experience	1,271	17.6	11.3	1	60

Fulltime temporary worker	1,271	26.0	94.4	0	2,000
Fulltime permanent worker	1,271	87.5	362.0	1	8,000
Worker high school educated	1,166	83.8	26.7	0	100
Audited financial statements	1,271	0.8	0.4	0	1
Transport obstacle	1,271	0.2	0.4	0	1
Electricity obstacle	1,271	0.2	0.4	0	1
Website	1,271	0.5	0.6	-9	1
Informal	1,271	0.2	0.4	0	1
Customs obstacle	1,271	0.2	0.4	0	1
Theft obstacle	1,271	0.1	0.3	0	1
Land obstacle	1,271	0.2	0.4	0	1
Finance obstacle	1,271	0.2	0.4	0	1
Tax obstacle	1,271	0.3	0.5	0	1
Tax admin obstacle	1,271	0.2	0.4	0	1
License obstacle	1,271	0.1	0.4	0	1
Politics obstacle	1,271	0.4	0.5	0	1
Corruption obstacle	1,271	0.3	0.5	0	1
Courts obstacle	1,271	0.2	0.4	0	1
Labour regulation obstacle	1,271	0.1	0.3	0	1
Part of a larger firm	1,271	0.2	0.4	0	1
HQ not located with sales and/or production	532	0.8	0.4	0	1
HQ located with sales and/or production	532	0.02	0.1	0	1
Firm not located with HQ, sales and/or production	532	0.1	0.2	0	1
Firm not located with HQ but with sales and/or production	532	0.1	0.3	0	1
Product innovation	1,271	0.6	0.5	0	1
Market innovation	1,271	0.4	0.5	0	1
Organizational innovation	1,271	0.4	0.5	0	1
R&D innovation	1,271	0.2	0.4	0	1

Outside the Main City	1,271	0.4	0.5	0	1
Within the Main City	1,271	0.6	0.5	0	1
Mombasa region	1,271	0.1	0.3	0	1
Kilifi region	1,271	0.03	0.2	0	1
Machakos region	1,271	0.03	0.2	0	1
Kirinyaga region	1,271	0.1	0.2	0	1
Kiambu region	1,271	0.1	0.3	0	1
Transzoia region	1,271	0.02	0.1	0	1
Uasingishu region	1,271	0.04	0.2	0	1
Nakuru region	1,271	0.1	0.3	0	1
Kisumu region	1,271	0.1	0.3	0	1
Nairobi region	1,271	0.4	0.5	0	1
Nyeri region	1,271	0.02	0.1	0	1
Muranga region	1,271	0.01	0.1	0	1
Shareholding company with shares trade in the stock market	1,271	0.03	0.2	0	1
Shareholding company with non-traded shares or shares traded privately	1,271	0.2	0.4	0	1
Sole proprietorship	1,271	0.3	0.5	0	1
Partnership	1,271	0.1	0.3	0	1
Limited partnership	1,271	0.4	0.5	0	1
Food sector	1,271	0.2	0.4	0	1
Textiles and Garments sector	1,271	0.1	0.2	0	1
Chemical, Pharmaceutical, and Plastic sector	1,271	0.1	0.3	0	1
Other Manufacturing sector	1,271	0.2	0.4	0	1
Retail sector	1,271	0.2	0.4	0	1
Tourism sector	1,271	0.1	0.3	0	1
Other Services sector	1,271	0.2	0.4	0	1
Years without registration^2	1,265	9.9	149.0	0	4,761

**A3: Descriptive Statistics South Africa**

Statistic	N	Mean	St. Dev.	Min	Max
Registered at start	673	0.9	0.2	0	1
Years without registration	673	0.2	1.0	0	12
Firm age	673	20.3	17.9	4	142
Government contract	673	0.1	0.3	0	1
Size at inception	673	1.9	0.7	1	3
State ownership	673	0.0	0.0	0	0
Domestic ownership	673	0.9	0.3	0	1
Female owner	673	0.2	0.4	0	1
Export	673	1.0	0.0	1	1
Credit line	673	0.3	0.5	0	1
Credit working capital	673	1.0	0.0	1	1
Other credit working capital	673	1.0	0.0	1	1
Managers years of experience	672	15.6	10.8	1	61
Fulltime temporary worker	673	20.8	151.1	0	2,691
Fulltime permanent worker	673	120.5	512.6	5	9,600
Worker high school educated	456	3.3	0.7	3	5
Audited financial statements	673	0.8	0.4	0	1
Transport obstacle	673	0.05	0.2	0	1
Electricity obstacle	673	0.2	0.4	0	1
Website	673	0.5	0.5	0	1
Informal	673	0.02	0.1	0	1
Customs obstacle	673	0.02	0.2	0	1
Theft obstacle	673	0.4	0.5	0	1
Land obstacle	673	0.1	0.2	0	1
Finance obstacle	673	0.1	0.3	0	1
Tax obstacle	673	0.1	0.2	0	1
Tax admin obstacle	673	0.02	0.2	0	1
License obstacle	673	0.02	0.1	0	1

Politics obstacle	673	0.03	0.2	0	1
Corruption obstacle	673	0.2	0.4	0	1
Courts obstacle	673	0.01	0.1	0	1
Labour regulation obstacle	673	0.1	0.3	0	1
Part of a larger firm	673	0.4	0.5	0	1
Within the Main City	673	1.0	0.0	1	1
Cape Town region	673	0.2	0.4	0	1
Durban region	673	0.1	0.4	0	1
Johannesburg region	673	0.6	0.5	0	1
Gqeberha region	673	0.1	0.3	0	1
Publicly listed company	673	0.01	0.1	0	1
Private held, limited company	673	0.6	0.5	0	1
Sole proprietorship	673	0.2	0.4	0	1
Partnership	673	0.1	0.3	0	1
Limited partnership	673	0.1	0.3	0	1
Closed Company	673	0.02	0.1	0	1
Other manufacturing sector	673	0.1	0.3	0	1
Food sector	673	0.01	0.1	0	1
Textiles sector	673	0.1	0.3	0	1
Garments sector	673	0.1	0.3	0	1
Chemicals sector	673	0.02	0.1	0	1
Plastics and rubber sector	673	0.01	0.1	0	1
Nonmetallic mineral products sector	673	0.1	0.3	0	1
Fabricated metal products sector	673	0.03	0.2	0	1
Machinery and equipment sector	673	0.02	0.2	0	1
Construction sector	673	0.02	0.1	0	1
Other services sector	673	0.03	0.2	0	1
Wholesale sector	673	0.02	0.1	0	1
Retail sector	673	0.2	0.4	0	1
Hotel & Restaurant sector	673	0.1	0.3	0	1

Transport sector	673	0.003	0.1	0	1
IT sector	673	0.0	0.0	0	0
Years without registration^2	673	0.9	8.3	0	144

Tables A4, A5 and A6 contain an extension of hypothesis 3 where all the covariates for the respective countries are included in the model specification. Covariates like sector and region were excluded as they were inconsistent across countries. Considering sector alone, this results in over 20 variables in the aggregated model which increases the degrees of freedom significantly and decreases the strength of the model.

#### **A4: Nigeria Regression: All covariates**

<i>Dependent Variable:</i>						
Employment Productivity Growth						
	Coef.	St.Err.	t-value	p-value	[95% Conf. Interval]	Sig
Years without registration	.131	.051	2.57	.01	.031	.23 **
years_without_registration^2	-.004	.003	-1.67	.094	-.009	.001 *
Female owner	.141	.242	0.58	.56	-.334	.616
Export	-.38	.232	-1.64	.102	-.836	.076
Product innovation	.757	.271	2.79	.005	.225	1.289 ***
Market innovation	-.026	.261	-0.10	.92	-.538	.485
Method innovation	-.204	.259	-0.79	.432	-.713	.305
Marketing innovation	-.19	.241	-0.79	.432	-.663	.284
R&D innovation	-.032	.259	-0.12	.901	-.54	.476
Organizational innovation	.044	.236	0.19	.852	-.419	.507
Logistic innovation	-.212	.242	-0.88	.381	-.686	.262
Idea time	-.597	.205	-2.91	.004	-1	-.195 ***
Outside the Main City	0	.	.	.	.	.
Within the Main City	-.214	.198	-1.08	.28	-.602	.174
East region	0	.	.	.	.	.
North region	.252	.266	0.95	.344	-.27	.773
West region	.512	.317	1.61	.107	-.11	1.134
Fulltime permanent worker	-.001	.001	-1.08	.282	-.002	.001
Worker high school educated	-.006	.003	-2.36	.019	-.011	-.001 **
Website	-.265	.265	-1.00	.317	-.785	.254
Audited financial statements	.266	.234	1.14	.256	-.193	.725

Firm size	.563	.135	4.18	0	.299	.828	***
Firm age	-.012	.01	-1.18	.236	-.031	.008	
Fabricated Metal Products sector	0	.	.	.	.	.	
Food & Beverage sector	.31	.51	0.61	.544	-.691	1.312	
Furniture sector	-.016	.495	-0.03	.974	-.986	.955	
Garments sector	.663	.523	1.27	.206	-.364	1.689	
Non-metallic mineral sector	.748	.516	1.45	.147	-.264	1.761	
Publishing sector	1.054	.501	2.10	.036	.071	2.037	**
Other Manufacturing sector	-.182	.51	-0.36	.721	-1.182	.818	
Other services sector	.246	.567	0.43	.665	-.867	1.359	
Repair & Sale of Motor vehicle sector	-.093	.519	-0.18	.858	-1.111	.926	
Wholesale sector	.496	.703	0.71	.481	-.883	1.875	
Hotel & Restaurant sector	-.068	.596	-0.11	.909	-1.237	1.1	
Retail sector	.964	.544	1.77	.076	-.102	2.031	*
Transport sector	-.13	.581	-0.22	.823	-1.27	1.01	
Manufacturing Panel sector	.768	.448	1.71	.087	-.112	1.647	*
Retail Panel sector	.59	.458	1.29	.198	-.308	1.489	
Other Services Panel sector	.353	.48	0.73	.463	-.59	1.295	
Size at inception	.001	0	1.32	.186	0	.001	
State ownership	.779	1.308	0.60	.552	-1.787	3.345	
Domestic ownership	.227	.233	0.97	.33	-.23	.685	
Shareholding company with shares trade in the stock market	0	.	.	.	.	.	
Shareholding company with non-traded shares or shares traded	-.698	.764	-0.91	.361	-2.197	.8	
Sole proprietorship	-.181	.612	-0.30	.768	-1.382	1.021	
Partnership	.707	.664	1.07	.287	-.596	2.011	
Limited partnership	-.158	.711	-0.22	.824	-1.552	1.237	
Credit line	-.001	.338	-0.00	.998	-.664	.662	
Informal	.285	.224	1.27	.204	-.155	.725	
Transport obstacle	.235	.256	0.92	.358	-.267	.737	
Electricity obstacle	-.001	.182	-0.00	.997	-.358	.357	
Customs obstacle	.407	.296	1.38	.168	-.173	.987	

Theft obstacle	-.066	.311	-0.21	.831	-.676	.543	
Land obstacle	-.241	.24	-1.00	.315	-.711	.23	
Finance obstacle	.082	.221	0.37	.71	-.352	.516	
Tax obstacle	.203	.27	0.75	.452	-.327	.733	
Tax admin obstacle	-.298	.301	-0.99	.322	-.889	.292	
License obstacle	.013	.305	0.04	.967	-.585	.611	
Politics obstacle	.058	.232	0.25	.804	-.398	.513	
Corruption obstacle	-.351	.211	-1.67	.096	-.765	.062	*
Courts obstacle	.044	.396	0.11	.912	-.734	.821	
Labour regulation obstacle	-.456	.404	-1.13	.259	-1.248	.336	
Government contract	-.075	.315	-0.24	.812	-.694	.544	
HQ not located with sales and/or production	-.671	.674	-1.00	.32	-1.995	.652	
HQ located with sales and/or production	-.703	.698	-1.01	.314	-2.073	.667	
Firm not located with HQ, sales and/or production	-.556	.685	-0.81	.417	-1.899	.788	
Firm not located with HQ but with sales and/or production	-.916	.755	-1.21	.225	-2.397	.565	
Constant	.79	1.057	0.75	.455	-1.283	2.863	
Mean dependent var		0.801	SD dependent var			2.834	
R-squared		0.095	Number of observations			1111.00	
						0	
F-test		1.750	Prob > F			0.000	
Akaike crit. (AIC)		5483.498	Bayesian crit. (BIC)			5804.33	
						1	

\*\*\* p<.01, \*\* p<.05, \* p<.1

WBES Nigeria

#### A5: Kenya Regression: All covariates

<i>Dependent Variable:</i>						
Employment Productivity Growth						
Coef.	St.Err.	t-value	p-value	[95% Conf. Interval]	Sig	

Years without registration	033	021	1.57	.117	-.008	.075	
Years without registration^2	-.001	.001	-0.90	.37	-.003	.001	
Female owner	.041	.041	1.00	.319	-.04	.123	
Export	0	.	.	.	.	.	
Product innovation	-.027	.057	-0.47	.637	-.138	.085	
Market innovation	.108	.048	2.25	.025	.014	.202	**
Organizational innovation	.077	.048	1.61	.107	-.017	.171	
R&D innovation	.033	.048	0.70	.487	-.061	.128	
Outside the Main City	0	.	.	.	.	.	
Within the Main City	-.01	.056	-0.17	.861	-.12	.101	
Mombasa region	0	.	.	.	.	.	
Kirinyaga region	-.04	.181	-0.22	.826	-.396	.316	
Kiambu region	-.135	.097	-1.40	.163	-.325	.055	
Nakuru region	-.041	.08	-0.51	.609	-.198	.116	
Kisumu region	.204	.085	2.39	.017	.036	.372	**
Nairobi region	0	.	.	.	.	.	
Nyeri region	-.094	.116	-0.82	.415	-.322	.133	
Murang'a region	-.026	.16	-0.17	.869	-.34	.288	
Fulltime permanent worker	0	0	0.31	.757	0	0	
Worker high school educated	.001	.001	1.33	.186	0	.003	
Website	.096	.043	2.23	.027	.011	.181	**
Audited financial statements	-.012	.062	-0.19	.849	-.134	.11	
Firm size	.001	.027	0.05	.962	-.052	.054	
Firm age	-.003	.001	-2.89	.004	-.006	-.001	***
Food sector	0	.	.	.	.	.	
Textiles and Garments sector	.025	.084	0.30	.764	-.14	.191	
Chemical, Pharmaceutical, and Plastic sector	-.16	.089	-1.81	.072	-.334	.014	*
Other Manufacturing sector	-.093	.066	-1.41	.158	-.222	.036	
Retail sector	-.176	.072	-2.44	.015	-.318	-.034	**
Other Services sector	-.157	.069	-2.26	.024	-.293	-.02	**
Size at inception	0	0	0.55	.582	0	0	
State ownership	0	.	.	.	.	.	
Domestic ownership	-.073	.061	-1.19	.233	-.194	.047	

Shareholding company with shares trade in the stock market	0	.	.	.	.	.	
Shareholding company with non-traded shares or shares traded privately	-0.422	.145	-2.91	.004	-.706	-.137	***
Sole proprietorship	-.22	.144	-1.53	.127	-.503	.063	
Partnership	-.338	.15	-2.25	.025	-.634	-.042	**
Limited partnership	-.293	.14	-2.09	.037	-.569	-.017	**
Credit line	0	.043	-0.00	1	-.084	.084	
Informal	.044	.053	0.84	.402	-.059	.148	
Transport obstacle	.003	.05	0.06	.952	-.096	.102	
Electricity obstacle	.028	.05	0.56	.577	-.07	.126	
Customs obstacle	-.074	.054	-1.36	.173	-.18	.032	
Theft obstacle	.02	.051	0.40	.689	-.08	.12	
Land obstacle	.011	.05	0.22	.828	-.087	.109	
Finance obstacle	-.008	.055	-0.14	.891	-.116	.101	
Tax obstacle	.004	.056	0.07	.945	-.106	.114	
Tax admin obstacle	.003	.066	0.05	.96	-.126	.133	
License obstacle	.072	.063	1.16	.248	-.051	.195	
Politics obstacle	.057	.05	1.14	.254	-.041	.156	
Corruption obstacle	.073	.052	1.43	.155	-.028	.175	
Courts obstacle	-.028	.055	-0.51	.609	-.136	.08	
Labour regulation obstacle	-.02	.056	-0.35	.724	-.129	.09	
Government contract	.018	.049	0.36	.722	-.08	.115	
HQ not located with sales and/or production	.063	.163	0.39	.698	-.256	.383	
HQ located with sales and/or production	-.045	.219	-0.21	.836	-.476	.385	
Firm not located with HQ, sales and/or production	-.075	.178	-0.42	.676	-.425	.276	
Firm not located with HQ but with sales and/or production	.074	.173	0.43	.668	-.265	.413	
Constant	.335	.236	1.42	.156	-.128	.799	
Mean dependent var	0.133					0.441	
SD dependent var							

R-squared	0.155	Number of observations	532.000
F-test	1.729	Prob > F	0.002
Akaike crit. (AIC)	652.368	Bayesian crit. (BIC)	874.754

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

WBES Kenya

**A6: South Africa Regression: All covariates**

	<i>Dependent Variable:</i>						
	Employment Productivity Growth						
	Coef.	St.Err.	t-value	p-value	[95% Conf. Interval]	Sig	
Years without registration	-.035	.06	-0.58	.559	-.153	.083	
Years without registration^2	.003	.007	0.47	.639	-.01	.016	
Female owner	.022	.057	0.38	.701	-.09	.133	
Export	0	.	.	.	.	.	
Within the Main City	0	.	.	.	.	.	
Johannesburg region	0	.	.	.	.	.	
Cape Town region	.043	.065	0.65	.514	-.086	.171	
Gqeberha region	-.006	.085	-0.07	.941	-.172	.16	
Durban region	.11	.072	1.53	.126	-.031	.252	
Fulltime permanent worker	0	0	0.86	.392	0	0	
Worker high school educated	-.013	.033	-0.38	.707	-.078	.053	
Website	.01	.052	0.19	.853	-.093	.112	
Audited financial statements	.03	.063	0.47	.638	-.095	.154	
Firm size	-.085	.037	-2.29	.023	-.158	-.012	**
Firm age	-.005	.001	-3.36	.001	-.008	-.002	***
Other manufacturing sector	0	.	.	.	.	.	
Food sector	-.13	.066	-1.97	.049	-.26	0	**
Textiles sector	-.067	.152	-0.44	.661	-.366	.232	
Garments sector	-.15	.074	-2.02	.044	-.295	-.004	**
Chemicals sector	-.031	.073	-0.42	.673	-.175	.113	
Plastics and rubber sector	.012	.129	0.09	.927	-.242	.265	
Nonmetallic mineral products sector	.328	.179	1.83	.068	-.024	.681	*

Fabricated metal products sector	.043	.071	0.60	.546	-.097	.182	
Machinery and equipment sector	-.024	.11	-0.22	.829	-.239	.192	
Electronics sector	.383	.127	3.01	.003	.133	.632	***
Size at inception	0	0	-3.00	.003	-.001	0	***
State ownership	0	.	.	.	.	.	
Domestic ownership	.048	.066	0.72	.472	-.082	.177	
Publicly listed company	0	.	.	.	.	.	
Private held, limited company	.166	.347	0.48	.633	-.516	.848	
Sole proprietorship	.115	.352	0.33	.743	-.576	.806	
Partnership	.118	.353	0.33	.738	-.576	.812	
Limited partnership	.192	.352	0.54	.586	-.5	.883	
Closed Company	-.17	.382	-0.45	.656	-.921	.581	
Credit line	-.117	.049	-2.39	.017	-.214	-.021	**
Informal	-.104	.155	-0.67	.502	-.409	.2	
Transport obstacle	-.249	.107	-2.33	.02	-.46	-.039	**
Electricity obstacle	.035	.053	0.65	.515	-.07	.139	
Customs obstacle	.144	.149	0.97	.335	-.149	.436	
Theft obstacle	0	.052	0.01	.995	-.102	.102	
Land obstacle	.232	.106	2.19	.029	.024	.44	**
Finance obstacle	.196	.081	2.41	.017	.036	.356	**
Tax obstacle	.294	.105	2.81	.005	.088	.5	***
Tax admin obstacle	-.137	.144	-0.95	.341	-.419	.145	
License obstacle	.058	.182	0.32	.75	-.3	.416	
Politics obstacle	.016	.154	0.10	.919	-.287	.318	
Corruption obstacle	-.044	.068	-0.64	.52	-.178	.09	
Courts obstacle	-.312	.213	-1.47	.143	-.73	.106	
Labour regulation obstacle	.141	.091	1.56	.12	-.037	.319	
Government contract	-.026	.063	-0.41	.683	-.149	.098	
Constant	.454	.381	1.19	.234	-.294	1.203	

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Mean dependent var	0.348	SD dependent var	0.474
R-squared	0.233	Number of observations	453.000
F-test	2.811	Prob > F	0.000
Akaike crit. (AIC)	577.834	Bayesian crit. (BIC)	763.050

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\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$



UNIVERSITY OF THE  
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JOHANNESBURG


**Faculty of Commerce, Law and Management**

**Candidate's Declaration**

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<b>Title of Thesis/Dissertation/ Research Report:</b>	Relationship between starting up unregistered and firm performance in sub-Saharan Africa: does duration matter?

**Candidate's Declaration:**

- i. I hereby submit my PhD Thesis/Masters dissertation for examination (circle applicable).
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**Declaration**

I, Professor Adeola Oyenubi, declare that I have seen the final product of the research paper by Kgalalelo Matsitse. I approve the research paper for submission.

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Prof Adeola Oyenubi