# THE AFRICAN ENTREPRENEURSHIP GAPS: HOW IMPORTANT ARE THE INSTITUTIONAL ENVIRONMENTS AND THE FINANCIAL SYSTEM?

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# The African entrepreneurship gaps: How important are the institutional environments and the financial system?

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## Abstract

Entrepreneurship is widely recognized as an important driver of economic growth and structural transformation. This study examines the effects of institutional quality and financial sector development on entrepreneurship using data for 26 African countries and 80 non-African countries, comprising mainly emerging and developed economies, over the period 2002-2016. Entrepreneurship is measured using data from the World Bank Entrepreneurship Database and the Global Entrepreneurship Monitor. The study pursues two objectives: first, to investigate the impact of institutional quality and financial sector development on entrepreneurship; and second, to assess the existence and magnitude of entrepreneurship gaps in Africa. The results show that both institutional quality and financial sector development are positively and significantly associated with entrepreneurship, and that these findings are robust to alternative measures of both constructs. Furthermore, African countries exhibit significantly lower levels of entrepreneurship than non-African countries. Entrepreneurship-gap estimates indicate that actual entrepreneurship levels in many African countries fall short of those predicted under the stronger institutional and financial conditions observed in emerging and developed economies outside Africa. Results based on the World Bank Entrepreneurship Database are generally more robust than those obtained using Global Entrepreneurship Monitor data. Overall, the findings underscore the critical role of strong institutions and well-developed financial systems in promoting entrepreneurship. The study concludes that narrowing entrepreneurship gaps in Africa requires sustained efforts to improve institutional quality and deepen financial sector development, thereby creating a more conducive environment for entrepreneurial activity and economic growth.

**Keywords**: Entrepreneurship; financial development; institutional quality; entrepreneurship gap; Africa; economic development.

## 1. Introduction

The importance of the private sector, particularly small and medium-sized enterprises (SMEs), in any economy cannot be overstated. Through job creation, tax generation, innovation, export promotion, and investment, the private sector contributes significantly to poverty reduction, economic diversification, and inclusive growth. In Africa, the sustainability of long-term economic growth is closely linked to the development of a vibrant and competitive private sector. Historically, the African private sector has been a major contributor to economic activity, employing approximately 90% of the working-age population, generating around 80% of total production and accounting for nearly two-thirds of total investment (African Development Bank, 2011; Stampini *et al*., 2011). More recent evidence continues to underscore the central role of the private sector in Africa's development agenda. The International Monetary Fund (IMF), through the work of Amine et al. (2025), identifies private sector development as a critical driver of economic growth and job creation in Sub-Saharan Africa. The study argues that addressing constraints such as limited access to finance, inadequate infrastructure, and governance challenges could substantially improve firm performance and support broader economic development. Similarly, the African Development Bank emphasizes that increased private investment, entrepreneurship and SME development are essential for mobilizing domestic resources, accelerating structural transformation and achieving sustainable development across the continent (African Development Bank, 2025; Amine et al., 2025)[1]. Consequently, the African private sector possesses considerable potential to stimulate economic growth, create employment opportunities and reduce poverty through a range of direct and indirect multiplier effects. Strengthening the private sector therefore remains a key policy priority for African countries seeking to achieve sustained economic growth, structural transformation, employment creation and broad-based poverty reduction.

The number of firms in any given economy is affected by firm creation and entrepreneurship. The entry of new innovative players and the exit of weaker players drive productivity and employment, spurring economic growth. In Haltwanger *et al.* (2009), it is demonstrated that young firms are the main drivers of job creation. In Africa the existing firms are less productive than other comparable countries (Ramachandran, Gelb and Shah, 2009). Data from the Global Entrepreneurship Monitor (GEM) and the World Bank Entrepreneurship Database also show that the level of productive entrepreneurship is quite low in Africa compared to other regions. According to Brixiova et al. (2015), most of the entrepreneurship in SSA is necessity entrepreneurship rather than productive entrepreneurship, with most of the new entrants entering low-barrier and highly competitive sectors like the retail sector.

[1] Acs (2006) also argues that entrepreneurship is good for economic growth.

Table 1 shows regional figures on new business density[2] and the number of new limited liability companies. In 2014 the new business density for SSA was 2.24, much lower than the world average of 4.42. The number of new limited liability companies in SSA was about 13,000, while the world average was twice that. While these numbers may be covering only those firms formally registered, it is still important to note that formal entrepreneurship in Africa is still very low compared to other regions.

Table 1: New Business Density and Number of Limited Liability Companies (2014)

| Region | New business density | Number of new limited liability companies |
|---|---|---|
| East Asia & Pacific | 12.11 | 43 802.88 |
| OECD | 5.54 | 45 510.54 |
| Middle East & North Africa | 4.41 | 12 535.00 |
| Europe & Central Asia | 4.22 | 36 306.05 |
| SSA | 2.24 | 12 976.00 |
| Latin America & Caribbean | 2.22 | 15 442.47 |
| South Asia | 0.23 | 28 698.25 |
| **World Average** | **4.42** | **27 895.88** |

Source: World Bank Entrepreneurship Online Database. Accessed on: http://www.doingbusiness.org/data/exploretopics/entrepreneurship/research
Notes: New business entry density is defined as the number of newly registered corporations per 1,000 working-age people (those ages 15–64). (World Bank Online Database). The units of measurement are private, formal sector companies with limited liability (World Bank Online Database).

The aim of this study is to investigate the impact of financial development and institutional quality on firm creation. First, in a perfect world, all profitable projects must be able to attract funding (Rajan and Zingales, 2004). But in an imperfect world, capital may fail to move to the most profitable projects. In Africa, for example, the capital markets are imperfect in several respects. They are underdeveloped and lack depth (Allen et al., 2009). For example, in 2007 the SSA ratio of liquid liabilities to GDP was 30%; the SSA average ratio of private credit to GDP was 17% (Allen et al., 2009). The SSA average number of commercial bank branches per 100 000 adults was 3.90 in 2014 (World Development Indicators online database, 2016). The extent of financial exclusion in a number of African countries is still high. For example, according to the World Bank's 2025 Global Findex Database, even though 79% of the world's adults had an account with a bank in 2024, only 58% of adults in SSA had an account with a bank, having increased from 49% in 2021[3].

The African stock markets too, though getting better, are still in developmental stages in a number of countries. For example, the number of listed firms in SSA is still very small; most of the stock markets are still highly illiquid, and the markets are still small (as measured by market capitalization as a percentage of GDP). All these factors make it difficult for funds to flow from surplus to deficit units, including to entrepreneurs. It is therefore not surprising that 75% of the young entrepreneurs rely on

[2] New business entry density is defined as the number of newly registered corporations per 1,000 working-age people (those aged 15–64).
[3] For further details see Klapper, *et al.* (2025).

their own funding or on friends and relatives when starting businesses (Brixiova et al., 2015). All this implies that underdeveloped capital markets are characterized by suboptimal capital allocation.

The second important factor that also affects firm creation is the institutional environment. Good institutions (usually characterized by well-defined and well-protected property rights, efficient and effective justice system, well-defined rules and regulations, etc.) have a positive effect on entrepreneurial activities. There is ample evidence that good institutions are good for entrepreneurship. These include Desai et al. (2003), Klapper et al. (2006), Djankov et al. (2002), and Johnson et al. (1998). Desai et al. (2003), using data on EU, Central and Eastern European countries, found that countries with less corruption and better property rights had more entrepreneurship. Klapper et al. (2006) found that excessive and costly regulations hamper the creation of new firms. Djankov et al. (2002) and Johnson et al. (1998) found that excessive regulation, by driving new firms into the informal economy, stifles the creation of formal firms. So underdeveloped capital markets and poor institutional quality reinforce each other to reduce the levels of entrepreneurship (or firm creation).

### 1.1. Why Africa?

Africa provides a particularly compelling context for investigating entrepreneurship and firm creation for several reasons. First, institutional quality in many African countries remains relatively weak compared to that of emerging and developed economies. This influences entrepreneurial dynamics in important ways. For example, institutional weaknesses may affect both the nature and extent of entrepreneurial activity. High levels of corruption, coupled with inefficient and ineffective legal and judicial systems, may encourage rent-seeking and other forms of unproductive entrepreneurship rather than productive, innovation-driven entrepreneurship. In such an environment, individuals with strong entrepreneurial talent and viable business ideas may be incentivized to pursue careers in bureaucracy or other sectors where returns are less dependent on market competition. Consequently, the institutional environment may shape not only the quantity of entrepreneurship but also the type of entrepreneurship that emerges. It is therefore possible that entrepreneurship models developed in advanced economies, where institutional quality is generally stronger, may not fully explain entrepreneurial behaviour in African countries. As a result, these models' underlying assumptions may need to be adapted to better reflect African realities.

Second, Africa's private sector remains relatively small and, in many countries, less productive and less competitive than its counterparts in developed economies. The creation of new firms is therefore critical for expanding the private sector and strengthening its capacity to serve as an engine of economic growth, employment creation and poverty reduction.

Third, Africa's financial systems remain underdeveloped, with many individuals and businesses continuing to face significant constraints in accessing financial services and credit. It is therefore important to understand the extent to which existing financial systems support firm creation and entrepreneurial development. At the same time, it is necessary to examine how financial systems can be strengthened to play a more effective role in promoting entrepreneurship and business growth. Such insights are important for informing public policy as African countries continue to pursue financial sector reforms aimed at supporting inclusive economic development and improving the welfare of their citizens.

### 1.2. The quality of institutions in Africa

The quality of institutions in many African countries has historically been relatively poor and continues to lag behind that of many emerging and developed economies. Evidence from the World Bank (2016)'s[4] Ease of Doing Business rankings illustrates this challenge. At the time, no African country was ranked among the top 30 economies globally in terms of ease of doing business, while African countries were heavily represented among the lowest-ranked economies. A similar pattern was evident in measures of corruption. According to Transparency International's 2015 Corruption Perceptions Index, no African country featured among the top 20 least corrupt countries, and African countries accounted for a substantial proportion of the bottom-ranked countries[5]. Although these statistics are based on data from 2015 and 2016, more recent evidence continues to indicate that many African countries face significant institutional challenges, including weaknesses in governance, regulatory quality, contract enforcement, and corruption control. Table 2 compares key institutional indicators across regions and highlights the difficulties faced by firms in Sub-Saharan Africa. The evidence shows that contract enforcement often takes a considerable amount of time, while insolvency resolution can take several years. In addition, both the number of procedures required and the time needed to register a business in Sub-Saharan Africa remain above global averages. The cost of starting a business is also relatively high, placing an additional burden on entrepreneurs and potentially constraining private sector development. These institutional constraints increase the cost of doing business, discourage entrepreneurial activity, and may limit the ability of the private sector to contribute fully to economic growth, employment creation and poverty reduction.

[4] The World Bank no longer provides information on ease of doing business rankings.
[5] For further details, see: https://www.transparency.org/en/cpi/2015

Table 2: Institutional Quality Dimensions that affect Entrepreneurship or Firm Creation (2015)

| Region | Time to enforce a contract (days) | Quality of judicial processes index (0-18)[6] | Credit bureau coverage (% of adults) | Time it takes to resolve insolvency (years) | Number of procedures to go through when registering a company (number) | Time (Number of days required to complete all firm registration procedures) | Cost of registering a company (% of income per capita) |
|---|---|---|---|---|---|---|---|
| East Asia & Pacific | 553.8 | 7.6 | 21.9 | 2.7 | 7 | 25.9 | 23 |
| Europe & Central Asia | 480.7 | 10.5 | 37.4 | 2.3 | 4.7 | 10 | 4.8 |
| Latin America & Caribbean | 736.9 | 8.4 | 40.5 | 2.9 | 8.3 | 29.4 | 31 |
| Middle East & North Africa | 653.3 | 6.5 | 12 | 3 | 8.2 | 18.8 | 25.8 |
| OECD high income | 538.3 | 11 | 66.7 | 1.7 | 4.7 | 8.3 | 3.2 |
| South Asia | 1076.9 | 6.5 | 12.7 | 2.6 | 7.9 | 15.7 | 14 |
| Sub-Saharan Africa | 653.1 | 6.4 | 7.1 | 3 | 8 | 26.8 | 53.4 |
| **World Average[7]** | **670.4** | **8.13** | **28.3** | **2.6** | **7.0** | **19.3** | **22.2** |

Source: World Bank Doing Business Online Database
Notes: According to the World Bank Doing Business 2016 Report, a procedure is defined as any interaction of the company founders with external parties (for example, government agencies, lawyers, auditors, or notaries).

## 2. Objectives of the study

The main objective of the study is to empirically investigate the relationship between financial development and firm creation, as well as the relationship between institutional quality and firm creation. More specifically, the study aims to: (1) investigate the impact of financial development on firm creation; (2) investigate the impact of institutional quality on firm creation; and (3) investigate the presence of entrepreneurship gaps in Africa as well as estimate such gaps.

## 3. Literature Review

The literature review section looks at three main issues. The first section looks at the link between firm creation and financial development. The second section looks at the link between institutional quality and new firm creation. The final section concludes by looking at the impact of control variables (e.g., macro-instability, economic growth, infrastructure quality, level of education, population growth, and unemployment) on firm creation.

### *(a) Finance and Firm Creation*

Levine (1997) provides a detailed survey of the literature on the finance-growth nexus. The following functions, as enunciated by Levine (1997), are important in facilitating the creation of firms or in encouraging entrepreneurial activity. These are mobilization of financial resources, resource allocation, exertion of corporate control, and the facilitation of risk management. Most firms require external finance. The provision of external finance is usually associated with the problems of adverse selection

[6] The indicator ranges from 0 to 18, with 0 indicating poorest quality of judicial processes and 18 indicating the highest.
[7] World Average covers all countries and not necessarily the average for the stated regions.

and moral hazard. The first two functions - mobilization of financial resources and resource allocation – occur ex-ante (before finance has been extended), while the last two occur ex-post (after finance has been extended). A developing or growing financial system must increasingly get better at performing the above functions. Our approach in this section of the literature review is to assess the extent to which, in performing these functions, a well-developed (or developing) financial system also tends to stimulate entrepreneurial activity.

*Mobilization of financial resources* – financial institutions pool resources from different individual savers and transfer them to various deficit units (Levine, 1997). According to King and Levine (1993) and Levine (1997) the mobilization exercise is, however, not costless: it comes with transaction costs (associated with the pooling of savings from the disparate savers) and information costs (which are the costs emanating from convincing savers to relinquish the control of their savings). As a financial system develops it, among other things, develops its banking sector and its stock markets. These institutions are then able to facilitate the reduction of information and transaction costs; over and above reducing the attendant adverse selection and moral hazard problems commonly found in credit markets (Levine, 1997). An advanced financial system is usually characterized by an extensive branch network and stock markets that are easily accessed by all interested market players. This enables the financial system to cheaply mobilize more resources that can then be used to finance entrepreneurial activities. Availing sufficient resources for entrepreneurial activity implies that entrepreneurs can easily take advantage of investment opportunities as they arise. Well-developed financial systems also facilitate the development of various financial instruments that suit different entrepreneurs.

*Allocation of resources* – before investment projects are funded, they need to be evaluated, a costly exercise. In the absence of a well-developed financial system, such evaluation may have to be done by savers themselves. But the savers may lack the capacity or means to do the evaluation. As a result, funds may fail to smoothly flow from surplus to deficit units as savers may hesitate to relinquish control of their savings. Consequently, financial intermediaries with the expertise in project evaluation may then emerge to fill this gap. Given the large number of projects that they evaluate, and the attendant economies of scale, the financial intermediaries tend to do the evaluation exercises cheaply, enabling funds to flow cheaply and smoothly from surplus to deficit units. This means the financial system is placed in a special position in an economy, where it must assess, screen, and evaluate projects from potential entrepreneurs and then extend credit to promising projects that are less likely to fail. Well-developed financial systems are able to efficiently transfer funds from surplus to deficit units in a financial system while at the same time managing to reduce, if not eliminate, the attendant problems of moral hazard and adverse selection.

*Exert corporate control* – once finance has been extended, there is a need to reduce moral hazard by monitoring and exerting corporate control (Levine, 1997). This is important since markets where this

efficiently happens tend to significantly minimize these moral hazard problems, resulting in lower defaults and optimal exertion of efforts by entrepreneurs and/or management, something that contributes to cheaper finance. Well-developed capital markets are better able to perform this function. This is because in a well-developed financial market, firm owners and outside creditors (like banks) are better able to create arrangements that reduce the principal-agent problems that come with the separation of ownership and management. The absence of these financial arrangements, as is common in most less developed financial markets, tends to reduce the mobilization of savings and its flow to most profitable projects (Levine, 1997). This resultantly impedes the creation of new firms.

*Facilitate risk management* – Financial markets facilitate the hedging and pooling of risk (Levine, 1997). Two important risk types that can be significantly reduced or better managed in well-developed financial markets are liquidity and idiosyncratic risks. As a financial market develops, liquidity risk tends to decrease. Hence, well-developed financial markets (like those in the US and UK) tend to be highly liquid, while those in Africa, for example, tend to be less liquid. Highly liquid markets facilitate the cheap trading and creation of financial instruments – like equity, bonds, derivatives, etc. - that can then be used to finance investment projects. This is especially important given the mismatch between the preferences of finance providers (savers) and entrepreneurs. In most cases, the projects that the entrepreneurs want funded are long-term investment projects, but the investors may be more willing to fund short-term projects. As a financial market develops, it therefore reduces liquidity risk, facilitating the trading of financial instruments which are then used to finance investment projects by entrepreneurs (i.e., facilitating the creation of new firms). In highly liquid financial markets, the surplus units can hold financial instruments which they can easily and cheaply liquidate where necessary (Levine, 1997). These financial instruments are then used to finance long-term investments. This implies that firms and entrepreneurs have permanent access to finance, as financial instruments, like shares or stock on equity, would continue changing hands, satisfying the needs of short-term surplus units and those of the entrepreneurs with long-term investment projects. Financial markets, partly by being highly liquid, can also facilitate the creation of diversified portfolios. The fact that high-return projects tend to be riskier than low-return projects, coupled with the fact that savers tend not to like risk, implies that a less developed financial market tends to overly finance low-return projects. The ability of well-developed and highly liquid financial markets to create well-diversified portfolios enables the financing of high-return projects (Levine, 1997; Obstfeld, 1994). Thus, a developed financial market can easily cater for both long-term investors and entrepreneurs, while an underdeveloped markets tends to overly cater for short-term investors.

The foregoing discussion suggests that financial development promotes entrepreneurship by improving the mobilization and allocation of resources, enhancing corporate governance and facilitating risk management. However, given the relatively low levels of stock market development in many African countries, these functions are performed primarily by banks rather than capital markets. Commercial

banks remain the dominant financial intermediaries across the continent, accounting for the bulk of financial assets and serving as the principal source of external finance for businesses, particularly small and medium-sized enterprises (SMEs). In contrast, many African stock markets are characterized by low market capitalization, limited liquidity, a small number of listed firms, and high listing costs, all of which restrict their accessibility to most entrepreneurs. Consequently, the banking channel is likely to be the most important mechanism through which financial development promotes entrepreneurship in Africa. A well-developed banking sector facilitates entrepreneurship by mobilizing savings, screening and monitoring borrowers, reducing information asymmetries, mitigating adverse selection and moral hazard problems, and extending credit to viable business ventures. Improved access to bank credit relaxes the financing constraints faced by entrepreneurs, enabling them to establish new businesses and expand existing ones.

Nevertheless, stock market development should not be overlooked. Well-functioning stock markets complement banks by providing alternative sources of long-term finance, improving liquidity, facilitating risk diversification, strengthening corporate governance, and supporting the growth of innovative and high-potential firms. As African financial systems continue to mature, stock markets may play an increasingly important role in promoting entrepreneurship, particularly among larger firms and those operating in technology-intensive sectors. Thus, while financial development is expected to promote entrepreneurship through both banking-sector development and stock-market development, its impact in Africa is likely to operate predominantly through the banking sector because of the comparatively limited development of capital markets across much of the continent. Accordingly, we hypothesize that higher levels of financial development are associated with greater entrepreneurial activity, with the banking channel expected to play a particularly important role in the African context.

*(b) Institutional Quality and Firm Creation*

Defined as "the humanly devised constraints that shape human interaction" or as "the rules of the game in a society," institutions impose constraints on economic agents' behavior, ultimately affecting the emergence of entrepreneurs (North, 1990: 3). It is well-acknowledged in the literature that entrepreneurship is a composite act (see for example, Fogel et al. (2006)). The chain of entrepreneurial activity has the following components – information acquisition, economic foresight, risk tolerance, property rights, financing and market entry (Fogel et al., 2006). These components are, however, affected by institutions. Poor institutional environments are characterized by, among others, poor information flow, poor property rights and poorly developed financial systems. All these combine to stifle the development of entrepreneurial activities.

The emergence of an entrepreneur is also dependent on trust. An entrepreneur needs to build trust with various stakeholders – including own employees, customers, financiers, input suppliers, etc. This transactional trust is, however, difficult to build in environments characterized by institutional deficits. For example, relationships with financiers are riddled with information asymmetry problems like moral hazard, adverse selection, agency problems, etc. (Fogel, 2006). Such transactional trust also tends to increase with reputation, therefore tending to favour established firms and disadvantaging newly established start-ups. Thus, high-quality institutions, by engendering transaction trust, stimulate entrepreneurship.

*(c) Other Determinants of Firm Creation*

*Economic growth* – an increase in GDP per capita indicates a better performing economy. Economic growth is usually associated with high incomes and increases in the demand for goods and services. According to the prosperity-pull hypothesis, this may encourage the creation of new firms. Wang (2006) and Revelli and Tenga (1989) found supporting evidence.

*Population* – population size in a given economy indicates the size of the market. An increase in the population increases the demand for goods and services. This should encourage or increase new firm formation. The empirical evidence on this is, however, mixed. Reynolds (1994) and Armington and Acs (2002) found that population increase has a positive effect on new firm entry, while Garofoli (1994) and Sutaria and Hick (2004) found no effect.

*Unemployment* – when one loses a job, one may decide to start one's own business. An increase in unemployment, by tightening the labour market, tends to decrease the probability of securing another job, increasing the probability of starting one's own business. An increase in unemployment is, however, also associated with a reduction in aggregate demand, adversely affecting new firm creation. *A priori*, it is therefore impossible to tell what happens to firm creation as unemployment increases, since this depends on the two countervailing effects. This is also reflected in the literature. For example, Audretsch and Fritsch (1994) found that unemployment increases firm creation, while Garofoli (1994) and Saturina and Hicks (2004) found no evidence.

*Trade Openness* – trade openness implies that there is a bigger market for the products produced by entrepreneurs. We therefore expect a positive relationship between trade openness and entrepreneurship.

## 4. Data and Methodology

This study uses a panel data set covering 105 countries (26 African countries and 79 non-African countries), over the period 2002-2016, to achieve three important objectives. First, we use various measures of financial development to investigate the impact of financial development on firm creation/entrepreneurship in Africa. The financial development indicators used are: the ratio of total liquid liabilities (M3) to GDP, the ratio of total credit to the private sector to GDP, the ratio of total domestic credit provided by the banking sector to GDP, and a composite financial development indicator based on principal components analysis (Ndikumana, 2000). In addition to the above commonly used financial sector development measures, we also use the size of microfinance institutions as a measure of financial sector development. From the World Bank's Doing Business database, we also use a measure of financial sector development that captures the strength of credit reporting systems as well as the effectiveness of collateral and bankruptcy laws in facilitating lending.

Second, we use various measures of institutional quality (World Governance Indicators) – like property rights, regulatory quality, rule of law, and control of corruption - to assess the extent to which institutions drive firm creation or entrepreneurship in Africa. For robustness, we also create a composite indicator (using principal component analysis) based on the six governance indicators. In addition to the above commonly used institutional quality measures, we also use other non-traditional measures, which we feel are more relevant to the African environment. These include the following Doing Business Indicators from the World Bank: starting a business index, contract enforcement index, and the resolving insolvency index.

Third, drawing on variables related to firm creation, notably financial development and institutional quality, we estimate a counterfactual level of firm creation for African countries under the assumption that they possessed the more advanced financial systems and stronger institutional frameworks characteristic of developed and emerging economies outside Africa. The difference between these estimated levels and actual firm creation rates is then used to measure entrepreneurship gaps in African countries.

To test the relationship between financial development and firm creation, we use the following regression model:

$$FC_{it} = \beta_0 + \beta_1 FD_{it} + \sum_{i=1}^{K} \gamma_i X_{it} + \varepsilon_{it} \qquad \text{(1)}$$

To test the relationship between institutional quality and firm creation, we use the following regression model:

$$FC_{it} = \beta_0 + \beta_2 IQ_{it} + \sum_{i=1}^{K} \gamma_i X_{it} + \varepsilon_{it} \quad \text{.....(2)}$$

While acknowledging the fact that institutional quality fosters financial development, we also run equation (3), which includes both institutional quality and financial sector development measures.

$$FC_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 IQ_{it} + \beta_3 FD_{it} \times IQ_{it} + \sum_{i=1}^{K} \gamma_i X_{it} + \varepsilon_{it} \quad \text{.....(3)}$$

Where $FC_{it}$ stands for firm creation, $FD_{it}$ stands for the financial development indicator for country *i* at time *t*, $IQ_{it}$ stands for institutional quality, and X stands for other control variables. The above regression models use country-level data covering 26 African countries. The 26 countries included in the sample are those that were covered in the World Bank's Entrepreneurship database and had information on firm creation. The coefficients $\beta_1$ and $\beta_2$ capture the effects of financial development and quality of institutions on firm creation, respectively. A positive $\beta_1$ indicates that financial development stimulates firm creation, while a positive $\beta_2$ indicates a positive influence of institutional quality on firm creation.

To test for the existence of an entrepreneurship gap, we run the following regressions using data on both African and non-African countries:

$$FC_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 Africa_{it} + \sum_{i=1}^{K} \gamma_i X_{it} + \varepsilon_{it} \quad \text{.....(4)}$$

$$FC_{it} = \beta_0 + \beta_1 IQ_{it} + \beta_2 Africa_{it} + \sum_{i=1}^{K} \gamma_i X_{it} + \varepsilon_{it} \quad \text{.....(5)}$$

Where *Africa* is a dummy variable taking a value of 1 if the country is African and zero otherwise. If there exist entrepreneurship gaps in Africa, we expect the coefficient of the dummy variable to be negative and significant. After establishing the existence of the entrepreneurship gaps, the next step is to estimate the size of the African entrepreneurship gaps. The entrepreneurship gap is estimated by running either equation (1) or (2) using non-African countries only. The coefficients estimated in such

regressions are then used to do an out-of-sample prediction of African entrepreneurship[8]. What we are trying to do here is to estimate some kind of counterfactual entrepreneurship level. That is, what would be the level of African entrepreneurship if the conditions obtained in the non-African countries were also obtained in Africa. The results from the out-of-sample predictions are then compared to the actual levels of entrepreneurship in Africa. The entrepreneurship gap is defined as the difference between the predicted and actual levels of entrepreneurship. A positive gap implies that African entrepreneurship levels would rise if conditions in non-African countries were also present in Africa.

### 4.1 Measuring Entrepreneurship

We measure entrepreneurship using several indicators from the World Bank Entrepreneurship database and from the Global Entrepreneurship Monitor (GEM). We have data on two indicators of entrepreneurship from the World Bank. The first definition (Definition 1) looks at newly registered corporations during a given period. Firm creation using Definition 1 is therefore equal to the number of newly registered corporations during year t divided by the existing stock of corporations as of the end of year t-1 (entry). Definition 2 looks at firm entry per year, which is calculated as the number of newly registered corporations during year *t.* One weakness of the above definitions of entrepreneurship is that they focus on the formal sector. Entrepreneurs that remain in the informal sector, as is common in most African countries, are thus ignored by the above definitions. This is an important weakness as most of the entrepreneurs in Africa operate in the informal sector. To cater for the informal sector, we use the data from GEM.

The Global Entrepreneurship Monitor Report defines entrepreneurship in two relevant ways: nascent entrepreneurs and established business owners (Kelley, Singer, and Herrington, 2016). "Nascent entrepreneurs are those who have taken steps to start a new business, but have not yet paid salaries or wages for more than three months" (Kelley, Singer, and Herrington, 2016: 19). "New entrepreneurs are those who are running new businesses that have been in operation for between three and 42 months" (Kelley, Singer, and Herrington, 2016: 19). Total early-stage Entrepreneurial Activity (TEA) is the percentage of 18-64 years population who are either a nascent entrepreneur or new entrepreneurs as defined above. We use total early-stage entrepreneurial activity (TEA) as one measure of entrepreneurship. Table A1 shows the different variables to be used in the study, their definitions as well as their sources.

## 5. Data analysis and empirical results

[8] We follow Allen et al (2013) who used a similar approach to estimate African financial sector development gaps.

This section on data analysis is made up of two sub-sections. The first sub-section looks at the determinants of entrepreneurship in Africa. We especially want to investigate the impact of institutions and financial development on entrepreneurship. The second sub-section looks at the existence of entrepreneurship gaps in Africa.

### 5.1 Determinants of entrepreneurship in Africa

To assess the impact of institutional quality and financial sector development on entrepreneurship in Africa, we run equation (1) and equation (2). In these equations, entrepreneurship is expressed as a function of institutional quality, financial sector development, and some control variables. The control variables are unemployment, population, GDP per capita, and trade openness. Institutional quality is measured using a number of proxies. First, we use a composite institutional quality measure created using principal component analysis. The index was created from the six governance indicators. We also created two additional institutional quality indices: *Legal* and *Political*. *Legal* is an average of rule of law, regulatory quality, and corruption control. *Political* is an average of voice and accountability, political stability, and government effectiveness. The financial sector development indicator is measured using three commonly used indicators, namely, liquidity-to-liabilities ratio, bank credit, and private sector credit. We also use the three indicators to create a financial sector development composite indicator using the principal component analysis approach.

In order to assess the impact of institutional quality on entrepreneurship, we separately run entrepreneurship on institutional quality and the four control variables (excluding FSD). That is, we run entrepreneurship on the composite institutional quality indices and also run entrepreneurship on each of the six governance indicators, in each case including the four control variables but excluding the financial sector development measures. We avoid including both FSD measures and IQ measures in one regression to avoid the multicollinearity problems created by the fact that institutions and financial sector development measures are highly correlated. In order to assess the impact of financial sector development on entrepreneurship, we follow the above process. That is, we separately run entrepreneurship on the financial sector development composite index and also run entrepreneurship on each of the three financial sector development measures, in each case including the four control variables but excluding the institutional quality measures.

We start by running entrepreneurship on the composite institutional quality indicator (*IQ-pca*) and some control variables (see Column 1 in Table 3). The coefficient of institutions (measured by *IQ-pca*) is positive and significant, suggesting that better institutions foster entrepreneurship. This corroborates

findings by Bowen and De Clercq (2008), and Levie and Autio (2011). When we run entrepreneurship on the financial sector development composite index (without the institutional quality indicator but including the main control variables), we also find a positive and significant relationship between entrepreneurship and financial sector development (see Column 2 in Table 3). This confirms our hypothesis that a well-developed financial system, by ensuring an efficient flow of funds from surplus to deficit units in the capital markets, stimulates entrepreneurship. In Table 3's column 3, we run a regression that includes both the institutional quality and the financial sector development composite indices and notice that institutional quality is no longer significant, but the financial sector development coefficient is still positive and significant. The three financial sector development indicators (liquidity liabilities ratio, bank credit, and private sector credit) are separately included in the regressions shown in Table 3's columns 4 to 6. The results show a positive and significant relationship between the liquidity-to-liabilities ratio and entrepreneurship. The other two financial sector development measures - bank credit and private sector credit (*financial sector credit*) – were not significant.

Similarly, the six governance indicators were separately included in the regressions, and the results are shown in Table 3's columns 9 -14. The coefficients for most of the individual governance indicators are positive and significant at the 1% level. The composite institutional quality measures, *legal* and *political,* are also run separately and are found to be positively related to entrepreneurship (See Table 3's columns 7 and 8). *Legal* is an average of the following governance indicators: rule of law, regulatory quality, and control of corruption. *Political* is an average of the following governance indicators: voice and accountability, political stability, and government effectiveness. The above results further confirm the results from Table 3's column 1, where the composite institutional quality measure was used. When it comes to the control variables, we find that trade openness, GDP per capita, and population are positively related to entrepreneurship.

In order to investigate the impact of the African dummy on entrepreneurship – something that is important when it comes to the existence of entrepreneurship gaps to be estimated later - we run regressions similar to the above ones but using data on both African and non-African countries. We also include an African dummy among the independent variables. The aim is to investigate the presence of entrepreneurship gaps. Table 4 shows the results from the regressions. The results from the regressions suggest a negative and significant relationship between the *African* dummy and entrepreneurship, suggesting that indeed there is an entrepreneurship gap. In the next section, we further explore the implications of the negative coefficients of the African dummy variable. When it comes to the role of institutions and financial sector development, we find that the results are more or less similar to those in Table 3. The coefficients of the different measures of financial development and institutional

quality are all positive and significant. Unemployment is however found to be negatively related to firm creation, supporting the argument that unemployment reduces aggregate demand which adversely affects firm creation.

Table 3: Results for African Countries only: Determinants of Entrepreneurship

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unemployment | -0.004 | -0.004 | -0.0023 | -0.0060 | -0.0058 | -0.0042 | -0.0133 | -0.0105 | 0.0025 | -0.0010 | 0.0011 | -0.0108 | -0.0044 | 0.0020 |
| | (-0.365) | (-0.421) | (-0.2188) | (-0.5819) | (-0.5605) | (-0.4210) | (-1.2116) | (-0.9519) | (0.2160) | (-0.0874) | (0.0913) | (-0.9105) | (-0.3650) | (0.1728) |
| Ln(population) | 4.173*** | 3.691*** | 3.7043*** | 4.0389*** | 4.0109*** | 3.6908*** | 1.4225*** | 1.4891*** | 4.4923*** | 4.5961*** | 4.0628*** | 4.6192*** | 4.1727*** | 4.1860*** |
| | (6.176) | (6.232) | (6.2492) | (6.7397) | (6.6919) | (6.2319) | (8.1627) | (8.3755) | (6.7092) | (6.9253) | (5.9827) | (6.8741) | (6.1762) | (6.1232) |
| Ln(GDP per capita) | 0.619 | -0.146 | -0.0835 | -0.0308 | 0.0346 | -0.1457 | 1.3139*** | 1.3988*** | 0.4116 | 0.5130 | 0.7251* | 0.1744 | 0.6193 | 0.8237** |
| | (1.515) | (-0.393) | (-0.2214) | (-0.0762) | (0.0870) | (-0.3933) | (7.1453) | (7.7945) | (1.0074) | (1.3027) | (1.8068) | (0.4074) | (1.5152) | (2.0443) |
| Trade openness | 0.008*** | 0.008*** | 0.0078*** | 0.0081*** | 0.0081*** | 0.0079*** | 0.0116*** | 0.0114*** | 0.0077*** | 0.0074*** | 0.0082*** | 0.0076*** | 0.0078*** | 0.0076*** |
| | (3.705) | (4.325) | (4.3021) | (4.3273) | (4.3792) | (4.3248) | (6.0626) | (5.9145) | (3.7523) | (3.6286) | (3.8515) | (3.7280) | (3.7047) | (3.5513) |
| IQ-pca | 0.290** | | -0.1206 | | | | | | | | | | | |
| | (2.176) | | (-0.8907) | | | | | | | | | | | |
| FSD-pca | | 0.3509*** | 0.3305*** | | | | | | | | | | | |
| | | (3.177) | (2.9284) | | | | | | | | | | | |
| Bank credit | | | | 0.0063 | | | | | | | | | | |
| | | | | (1.2584) | | | | | | | | | | |
| Financial sector credit | | | | | 0.0044 | | | | | | | | | |
| | | | | | (0.9891) | | | | | | | | | |
| Liquidity liabilities | | | | | | 0.0154*** | | | | | | | | |
| | | | | | | (3.1774) | | | | | | | | |
| Legal | | | | | | | 0.8360*** | | | | | | | |
| | | | | | | | (4.0620) | | | | | | | |
| Political | | | | | | | | 0.7912*** | | | | | | |
| | | | | | | | | (3.4390) | | | | | | |
| Corruption control | | | | | | | | | 0.4808*** | | | | | |
| | | | | | | | | | (3.4576) | | | | | |
| Gov Effectiveness | | | | | | | | | | 0.7849*** | | | | |
| | | | | | | | | | | (4.0944) | | | | |
| Political stability | | | | | | | | | | | 0.2457** | | | |
| | | | | | | | | | | | (2.0518) | | | |
| Regulatory quality | | | | | | | | | | | | 0.6329*** | | |
| | | | | | | | | | | | | (3.6551) | | |
| Rule of law | | | | | | | | | | | | | 0.4858** | |
| | | | | | | | | | | | | | (2.1761) | |
| Voice | | | | | | | | | | | | | | -0.0546 |
| | | | | | | | | | | | | | | (-0.3033) |
| Constant | -64.679*** | -51.206*** | -51.880*** | -57.805*** | -57.814*** | -51.744*** | -25.137*** | -26.859*** | -68.188*** | -70.429*** | -63.645*** | -68.298*** | -64.460*** | -66.430*** |
| | (-7.229) | (-6.331) | (-6.383) | (-7.271) | (-7.249) | (-6.435) | (-8.066) | (-8.688) | (-7.773) | (-8.084) | (-7.053) | (-7.812) | (-7.197) | (-7.363) |
| Observations | 223 | 211 | 211 | 211 | 211 | 211 | 223 | 223 | 223 | 223 | 223 | 223 | 223 | 223 |
| R-squared | 0.56 | 0.57 | 0.57 | 0.55 | 0.55 | 0.57 | 0.54 | 0.56 | 0.60 | 0.60 | 0.57 | 0.59 | 0.57 | 0.56 |

Notes: t-statistics are in parenthesis. *, **, *** show the levels of significance at 10%, 5% and 1%. The dependent variable is the log of the number of new firms. *Africa* is a binary variable taking a value 1 if country is in Africa, 0 otherwise; *IQ-pca, FSD-pca* are the institutional quality and financial sector development indices that are constructed based on principal component analysis. Legal is an average of rule of law, regulatory quality and control of corruption; Political is an average of voice and accountability, political stability and government effectiveness. *Corruption control, gov effectiveness, Political stability, regulatory quality, rule of law and voice* are the six world governance indicators (namely: control of corruption, government effectiveness, political stability and absence of violence and terrorism, regulatory quality, rule of law, and voice and accountability as developed by Kaufmann *et al* (2009).

Table 4: Determinants of entrepreneurship for African and non-African countries (the role of the African dummy)

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unemployment | -0.0166*** | -0.0105 | -0.0090 | -0.0177*** | -0.0208*** | -0.0106 | -0.0098* | -0.0162*** | -0.0133** | -0.0166*** | -0.0163*** | -0.0084 | -0.0136** | -0.0174*** |
| | (-3.1465) | (-1.4698) | (-1.2668) | (-3.3532) | (-3.9102) | (-1.4838) | (-1.8651) | (-3.1099) | (-2.5056) | (-3.1465) | (-3.0523) | (-1.5777) | (-2.5752) | (-3.3007) |
| Ln(population) | 0.8618*** | 0.8165*** | 0.8109*** | 0.8288*** | 0.8254*** | 0.8164*** | 0.8977*** | 0.9236*** | 0.9099*** | 0.8618*** | 0.9039*** | 0.8488*** | 0.8870*** | 0.8849*** |
| | (12.5421) | (9.9208) | (10.7065) | (11.9830) | (11.4925) | (9.9174) | (13.1015) | (13.3049) | (12.7176) | (12.5421) | (12.2854) | (12.8128) | (12.7268) | (12.5353) |
| Ln(GDP per capita) | 0.0447** | 0.0620** | 0.0285 | 0.0685*** | 0.0692*** | 0.0619** | 0.0234 | 0.0356* | 0.0470** | 0.0447** | 0.0731*** | 0.0419** | 0.0337* | 0.0564*** |
| | (2.4432) | (2.5336) | (1.2281) | (3.7988) | (3.6812) | (2.5293) | (1.2578) | (1.9225) | (2.4620) | (2.4432) | (3.8435) | (2.4022) | (1.7747) | (3.0534) |
| Trade openness | 0.0052*** | 0.0048*** | 0.0048*** | 0.0052*** | 0.0052*** | 0.0048*** | 0.0051*** | 0.0052*** | 0.0052*** | 0.0052*** | 0.0054*** | 0.0051*** | 0.0052*** | 0.0051*** |
| | (7.9774) | (6.4966) | (6.5011) | (8.1257) | (8.0675) | (6.4738) | (7.9242) | (8.0663) | (7.9841) | (7.9774) | (8.2214) | (7.9640) | (7.9981) | (7.8128) |
| Africa | -0.5719* | -0.5561 | -0.5034 | -0.7110** | -0.6769** | -0.5553 | -0.5880* | -0.6120** | -0.6820** | -0.5719* | -0.7791** | -0.5888** | -0.6583** | -0.6041* |
| | (-1.8404) | (-1.5310) | (-1.5271) | (-2.2210) | (-2.0283) | (-1.5283) | (-1.9026) | (-1.9633) | (-2.1118) | (-1.8404) | (-2.3520) | (-1.9764) | (-2.0930) | (-1.8882) |
| IQ-pca | 0.4961*** | | 0.3514*** | | | | | | | | | | | |
| | (7.0316) | | (4.3506) | | | | | | | | | | | |
| FSD-pca | | 0.3656*** | 0.3080*** | | | | | | | | | | | |
| | | (5.6962) | (4.7628) | | | | | | | | | | | |
| Bank credit | | | | 0.0031*** | | | | | | | | | | |
| | | | | (4.1776) | | | | | | | | | | |
| Financial sector credit | | | | | 0.0026*** | | | | | | | | | |
| | | | | | (4.1796) | | | | | | | | | |
| Liquidity liabilities | | | | | | 0.0080*** | | | | | | | | |
| | | | | | | (5.7427) | | | | | | | | |
| Legal | | | | | | | 0.7985*** | | | | | | | |
| | | | | | | | (9.2089) | | | | | | | |
| Political | | | | | | | | 0.7338*** | | | | | | |
| | | | | | | | | (8.4935) | | | | | | |
| Corruption control | | | | | | | | | 0.4821*** | | | | | |
| | | | | | | | | | (6.8881) | | | | | |
| Govern effectiveness | | | | | | | | | | 0.5089*** | | | | |
| | | | | | | | | | | (7.0316) | | | | |
| Political Stability | | | | | | | | | | | 0.1781*** | | | |
| | | | | | | | | | | | (3.9561) | | | |
| Regulatory Quality | | | | | | | | | | | | 0.5928*** | | |
| | | | | | | | | | | | | (8.5401) | | |
| Rule of law | | | | | | | | | | | | | 0.6225*** | |
| | | | | | | | | | | | | | (7.5359) | |
| Voice | | | | | | | | | | | | | | 0.5379*** |
| | | | | | | | | | | | | | | (7.3424) |
| Constant | -5.6720*** | -5.2304*** | -4.7263*** | -5.5487*** | -5.4895*** | -5.7124*** | -6.2128*** | -6.6678*** | -6.5789*** | -5.8076*** | -6.7018*** | -5.6755*** | -6.0655*** | -6.2620*** |
| | (-4.9962) | (-3.8190) | (-3.7461) | (-4.8579) | (-4.6349) | (-4.2075) | (-5.5024) | (-5.8433) | (-5.5894) | (-5.1172) | (-5.5396) | (-5.1817) | (-5.2795) | (-5.3785) |
| Observations | 993 | 799 | 799 | 952 | 951 | 800 | 993 | 993 | 993 | 993 | 993 | 993 | 993 | 993 |

Notes: t-statistics are in parenthesis. *, **, *** show the levels of significance at 10%, 5% and 1%. The dependent variable is the log of the number of new firms. *Africa* is a binary variable taking a value 1 if country is in Africa, 0 otherwise; *IQ-pca, FSD-pca* are the institutional quality and financial sector development indices that are constructed based on principal component analysis. Legal is an average of rule of law, regulatory quality and control of corruption; Political is an average of voice and accountability, political stability and government effectiveness. *Corruption control, gov effectiveness, Political stability, regulatory quality, rule of law and voice* are the six world governance indicators (namely: control of corruption, government effectiveness, political stability and absence of violence and terrorism, regulatory quality, rule of law, and voice and accountability as developed by Kauffmann, Kraay and Mastruzzi (2009).

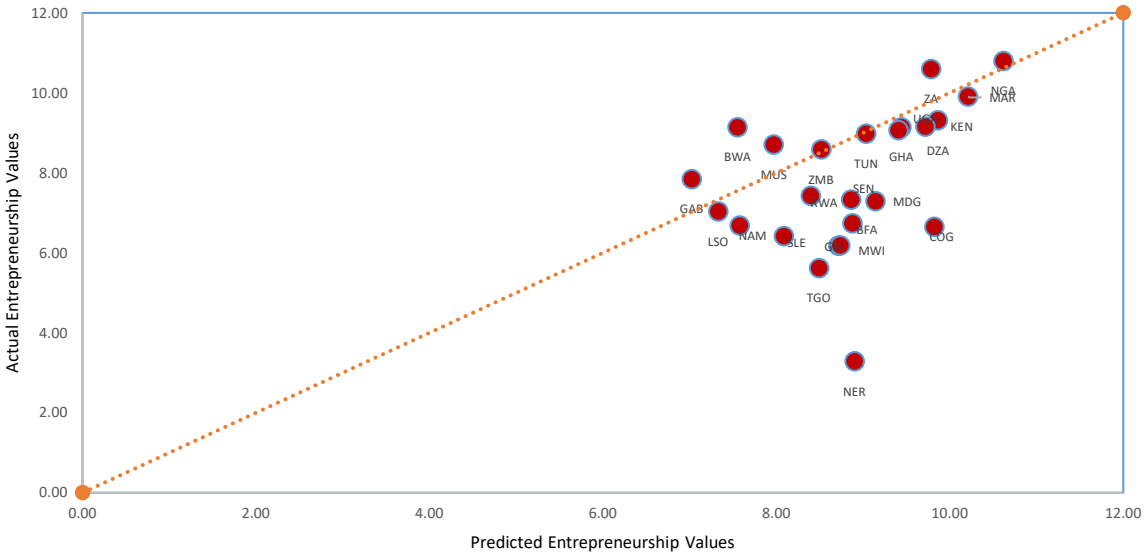
### 5.2 Predicted versus actual Africa entrepreneurship

In this section, we run regressions of equations (1) and (2) using data on non-African countries. The regression coefficients estimated from the regressions are then used to do an out-of-sample prediction of entrepreneurship in Africa. What we are trying to do here is to estimate some kind of counterfactual entrepreneurship level. That is, what would be the level of African entrepreneurship if the conditions obtained in the non-African countries were also obtained in Africa. The results from the out-of-sample predictions are then compared to the actual levels of entrepreneurship in Africa. The entrepreneurship gap is defined as the difference between predicted and actual levels of entrepreneurship. A positive gap implies that African entrepreneurship would rise if conditions in non-African countries were also obtained in Africa. In Figure 1, we show the predicted entrepreneurship levels that were obtained when running the regression of entrepreneurship on the composite financial sector development indicator (fsd_pca) as well as unemployment, population, GDP per capita, and trade openness. The figure plots predicted entrepreneurship levels against actual entrepreneurship levels for African countries. If actual and predicted entrepreneurship levels are equal, countries will lie on the dotted 45-degree line. Countries located below the dotted line are those for which predicted entrepreneurship levels exceed actual entrepreneurship levels, indicating unrealised entrepreneurial potential. The figure shows that only 6 countries out of 24 African countries have levels of entrepreneurship that are above their predicted values[9], for the rest predicted entrepreneurship is larger than actual, indicating significant unrealised entrepreneurial potential. This demonstrates that for a majority of African countries there is a positive entrepreneurship gap, implying that if African countries had financial systems and institutions that were as developed as the non-African countries in the sample, their entrepreneurship levels would have been higher. It is not surprising that countries like Botswana, Mauritius and South Africa – countries with better institutions and well-developed financial systems – have actual entrepreneurship levels that were larger than the predicted levels. The rest of African countries, including Niger, Togo, Malawi, Madagascar, etc., had positive entrepreneurship gaps.

A more or less similar picture is presented in Figure 2 where *Liquidity liabilities ratio* is used to measure financial sector development and the variable *Political* was used to measure institutional quality. Unemployment, population, GDP per capita, and trade openness were used as control variables, and the log of the number of new firms was used to measure entrepreneurship. These entrepreneurship gaps can be derived for each of the regression results shown in Table A3 in the appendix. The corresponding graphs that compare actual and predicted entrepreneurship values are presented in Figures A1-A10 in the appendix.

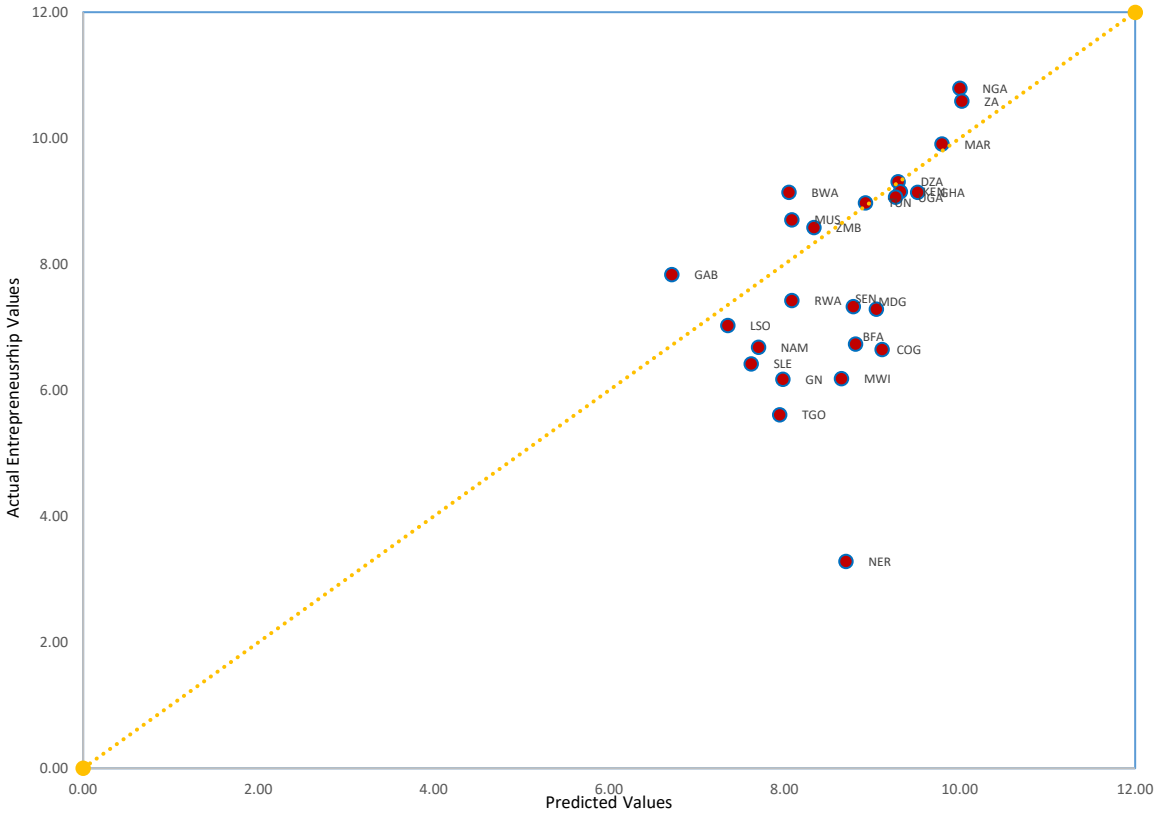
[9] The six countries are Botswana, Gabon, Mauritius, Nigeria, South Africa and Zambia.

Figure 1: Entrepreneurship in Africa Actual Versus Potential (When using a composite measure of financial sector development)




Notes: The composite financial sector development indicator (fsd_pca) was used to measure financial sector development. Unemployment, population, GDP per capita, and trade openness were used as control variables. The log of the number of new firms was used to measure entrepreneurship.

Figure 2: Entrepreneurship in Africa Actual Versus Potential (When using liquidity liabilities as a measure of financial sector development)




Notes: For the estimation of the gaps in this figure, the measure of financial sector development is *Liquidity liabilities.* The institutional quality indicator *Political* was also used. Unemployment, population, GDP per capita, and trade openness were used as control variables. The log of the number of new firms was used to measure entrepreneurship.

## 6. Robustness Checks

### 6.1. Using Size of Microfinance Institutions as a Measure of Financial Sector Development

As a robustness check, in addition to the traditional or commonly used measures of financial sector development (FSD), we use the size of microfinance institutions as a measure of FSD. We used the ratio of loans extended by microfinance institutions (MFIs) in a given country as a percentage of GDP, as well as the log of total assets[10]. Tables 5 and 6 show the results of the regressions. The results show a positive and significant relationship between these measures of FSD and entrepreneurship.

**Table 5: Determinants of entrepreneurship (using African countries only) when using loans extended by MFIs as a measure of financial sector development**

| | Fixed Effects Model | | | |
|---|---|---|---|---|
| **VARIABLES** | **(1)** | **(2)** | **(3)** | **(4)** |
| Unemployment | -0.0196 | -0.0287* | -0.0259* | -0.0269 |
| | (-1.2102) | (-1.8426) | (-1.6726) | (-1.6379) |
| Population | 2.5472*** | 2.7443*** | 3.2172*** | 2.7487*** |
| | (2.6739) | (3.0220) | (3.4862) | (2.9042) |
| GDP per capita | 1.2604** | 0.7388 | 0.2008 | 0.8252 |
| | (2.2023) | (1.3148) | (0.3285) | (1.3644) |
| Trade openness | 0.0065** | 0.0059** | 0.0063*** | 0.0065*** |
| | (2.6080) | (2.4767) | (2.6746) | (2.6386) |
| **MFI Size (mfiloans GDP ratio)** | **0.2620***** | **0.2552***** | **0.2259***** | **0.2485***** |
| | (4.9245) | (5.0384) | (4.3883) | (4.6906) |
| Political | | 1.1199*** | | |
| | | (3.7837) | | |
| Legal | | | 1.0650*** | |
| | | | (3.8118) | |
| IQ_pca | | | | 0.3526** |
| | | | | (2.0284) |
| Constant | -43.3170*** | -42.3112*** | -46.4302*** | -43.5042*** |
| | (-3.4232) | (-3.5125) | (-3.8495) | (-3.4795) |
| Observations | 152 | 152 | 152 | 152 |
| R-squared | 0.6265 | 0.6644 | 0.6649 | 0.6382 |
| Number of countries | 19 | 19 | 19 | 19 |

Notes: The dependent variable is log of new firms. t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1%. The dependent variable is the log of the number of new firms. *IQ-pca, FSD-pca* are the institutional quality and financial sector development indices that are constructed based on principal component analysis. Legal is an average of rule of law, regulatory quality, and control of corruption; Political is an average of voice and accountability, political stability and government effectiveness. *Corruption control, gov effectiveness, Political stability, regulatory quality, rule of law, and voice* are the six world governance indicators (namely: control of corruption, government effectiveness, political stability and absence of violence and terrorism, regulatory quality, rule of law, and voice and accountability as developed by Kaufmann, Kraay and Mastruzzi (2009).

[10] It must be noted that the data on MFIs in Africa is available for a limited number of years for a limited number of countries hence the low number of observations. Also, only private sector credit is significant when using TEA as the dependent variable; other FSD measures and IQ measures were not significant (See Table A4 in the appendix).

**Table 6: Determinants of entrepreneurship (using African countries only) when using log of MFI assets as a measure of financial sector development (2002- 2016)**

| | Fixed Effects Model | | | |
|---|---|---|---|---|
| **VARIABLES** | **(1)** | **(2)** | **(3)** | **(4)** |
| Unemployment | -0.0016 | -0.0087 | -0.0060 | -0.0041 |
| | (-0.0752) | (-0.4173) | (-0.2985) | (-0.1946) |
| Population | 3.8569*** | 3.9153*** | 4.4583*** | 4.3348*** |
| | (3.6168) | (3.8649) | (4.5392) | (4.1711) |
| GDP per capita | 0.2256 | -0.3915 | -1.3966* | -0.7522 |
| | (0.3197) | (-0.5668) | (-1.9263) | (-1.0053) |
| Trade openness | 0.0091*** | 0.0084*** | 0.0089*** | 0.0091*** |
| | (3.2152) | (3.1266) | (3.4593) | (3.3638) |
| Political | | 1.2299*** | | |
| | | (3.6839) | | |
| Legal | | | 1.4567*** | |
| | | | (4.8907) | |
| IQ_pca | | | | 0.6278*** |
| | | | | (3.1342) |
| **MFI Size (log of MFI assets)** | **0.2011** | **0.2426**** | **0.2567**** | **0.1862** |
| | (1.5958) | (2.0182) | (2.2192) | (1.5321) |
| Constant | -59.9821*** | -56.3208*** | -58.4677*** | -60.9581*** |
| | (-4.1173) | (-4.0596) | (-4.3907) | (-4.3394) |
| Observations | 138 | 138 | 138 | 138 |
| R-squared | 0.5626 | 0.6087 | 0.6379 | 0.5970 |
| Number of countries | 17 | 17 | 17 | 17 |

Notes: The dependent variable is log of new firms. t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1%. The dependent variable is the log of the number of new firms. *IQ-pca, FSD-pca* are the institutional quality and financial sector development indices that are constructed based on principal component analysis. Legal is an average of rule of law, regulatory quality and control of corruption; Political is an average of voice and accountability, political stability and government effectiveness. *Corruption control, gov effectiveness, Political stability, regulatory quality, rule of law and voice* are the six world governance indicators (namely: control of corruption, government effectiveness, political stability and absence of violence and terrorism, regulatory quality, rule of law, and voice and accountability as developed by Kauffmann, Kraay and Mastruzzi (2009).

## 6.2. Using Doing Business Measures of Institutional Quality

In addition to the commonly used institutional quality measures, we also use other non-traditional measures, which we feel are more relevant to the African environment. These include the following Doing Business Indicators from the World Bank: starting a business index, contract enforcement index, and the resolving insolvency index. Table 7 shows that when institutions related to starting a business (e.g., Starting a business score) and those related to credit extension (getting credit score) improve, they tend to stimulate entrepreneurship. The indicator measuring contract enforcement was, however, found to be insignificant.

**Table 7: Determinants of entrepreneurship (using African countries only) when using World Bank's Doing Business Indicators as measures of Institutional Quality (2002-2016)**

| VARIABLES | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Unemployment | -0.0096 | -0.0138 | -0.0144 | -0.0121 |
| | (-0.5697) | (-1.0951) | (-0.8166) | (-1.0339) |
| Population | 0.9254*** | 1.2099*** | 1.0685*** | 1.2350*** |
| | (5.9616) | (6.5825) | (5.1122) | (6.2044) |
| GDP per capita | 1.1475*** | 1.4754*** | 1.4129*** | 1.3848*** |
| | (6.2748) | (5.1959) | (6.4448) | (5.4775) |
| Trade openness | 0.0067*** | 0.0114*** | 0.0098*** | 0.0118*** |
| | (2.8341) | (4.7084) | (4.3352) | (5.2993) |
| Starting a business score | 1.0579*** | | | |
| | (4.1219) | | | |
| Contract enforcement in days | | 0.0644 | | |
| | | (0.2019) | | |
| Getting credit score | | | 0.2622** | |
| | | | (2.1520) | |
| Resolving solvency time | | | | -0.1125 |
| | | | | (-0.4623) |
| Constant | -20.1623*** | -23.5108*** | -20.7391*** | -22.7441*** |
| | (-6.8976) | (-5.5362) | (-5.2363) | (-5.2238) |
| Observations | 157 | 157 | 157 | 150 |

Notes: The dependent variable is log of new firms. t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1%. The dependent variable is the log of the number of new firms. *IQ-pca, FSD-pca* are the institutional quality and financial sector development indices that are constructed based on principal component analysis. Legal is an average of rule of law, regulatory quality and control of corruption; Political is an average of voice and accountability, political stability and government effectiveness. *Corruption control, gov effectiveness, Political stability, regulatory quality, rule of law and voice* are the six world governance indicators (namely: control of corruption, government effectiveness, political stability and absence of violence and terrorism, regulatory quality, rule of law, and voice and accountability as developed by Kauffmann, Kraay and Mastruzzi (2009).

## 7. Conclusions and policy implications

Using data for 26 African countries and 80 non-African countries, comprising mainly emerging and developed economies, over the period 2002-2016, this study examined the impact of institutional quality and financial sector development on entrepreneurship. In addition, it investigated the existence and magnitude of entrepreneurship gaps in African countries. Since institutions not only directly influence entrepreneurship but also play an important role in promoting financial sector development, regressions were estimated by including each variable separately, with models incorporating both variables used primarily as robustness checks.

We formulated and tested two important hypotheses. First, financial development was hypothesised to promote entrepreneurship. Second, higher institutional quality was expected to be associated with greater entrepreneurial activity. The empirical results provide strong support for both hypotheses. Financial sector development and institutional quality are consistently associated with higher levels of entrepreneurship. These findings remain robust across alternative measures of financial development and institutional quality. For example, in the sample comprising African countries only, the composite institutional quality index derived using principal component analysis is positive and statistically significant at the 5% level, while the corresponding composite measure of financial sector development

is significant at the 1% level. Other institutional quality indices, including the *Legal* and *Political* dimensions, are also positively and significantly related to entrepreneurship. Moreover, regressions separately incorporating each of the six World Governance Indicators reveal positive and statistically significant coefficients. Taken together, these findings suggest that institutional quality, irrespective of how it is measured, plays a critical role in fostering entrepreneurial activity.

Similar results are obtained when the sample is expanded to include both African and non-African countries. This further reinforces the importance of institutions and financial sector development as key determinants of entrepreneurship across different stages of economic development. In these pooled regressions, an African dummy variable was included to examine the existence of an entrepreneurship gap. The coefficient on the African dummy is consistently negative and statistically significant across most specifications, indicating that African countries tend to exhibit lower levels of entrepreneurship than their non-African counterparts after controlling for other factors.

This conclusion is further supported by the entrepreneurship-gap analysis. Positive entrepreneurship gaps are observed in many African countries when comparing predicted and actual levels of entrepreneurship. As defined in this study, the entrepreneurship gap is the difference between the level of entrepreneurship predicted by the model and the level actually observed. Predicted entrepreneurship reflects the level that African countries would be expected to attain if they possessed the higher levels of institutional quality and financial sector development typically observed in emerging and developed economies outside Africa. The results therefore suggest that deficiencies in institutions and financial systems contribute significantly to Africa's comparatively low levels of entrepreneurial activity.

Overall, the findings underscore the universal importance of institutional quality and financial sector development in promoting entrepreneurship. To the extent that entrepreneurship contributes to economic growth, these results also provide indirect support for the finance-growth literature. From a policy perspective, the findings imply that African countries seeking to stimulate entrepreneurial activity should prioritize reforms aimed at strengthening institutions and deepening financial sector development. Although institutional evolution is often shaped by country-specific historical and political factors, African countries need not reinvent the wheel. Valuable lessons can be drawn from both developed economies and successful African countries that have established stronger institutional frameworks and more effective financial systems.

When entrepreneurship is measured using data from the Global Entrepreneurship Monitor (GEM), however, the coefficients on institutional quality and financial sector development become statistically insignificant. This result is consistent across alternative measures of both variables. A plausible explanation is the substantially smaller sample size available in the GEM dataset, particularly for African countries. Consequently, these findings should be interpreted with caution.

The study is subject to several limitations. First, it is difficult to determine whether variation in the World Bank Entrepreneurship Database primarily captures the emergence of new entrepreneurial ventures or merely the formalization of existing businesses through official registration. To address this concern, entrepreneurship was also measured using data from the Global Entrepreneurship Monitor. However, the GEM database covers only a limited number of African countries, and for many of these countries, data are available for only a few consecutive years. This limits both country coverage and the time dimension of the analysis. Another limitation is that there is a possibility of reverse causality, with entrepreneurship possibly affecting financial development and the quality of institutions.

Several avenues for future research remain. For instance, what factors explain the substantial variation in institutional quality across African countries? Why do countries such as Botswana consistently outperform neighbouring countries such as Zimbabwe on institutional indicators? Furthermore, while several African countries have developed stock exchanges and capital markets, the extent to which these institutions have stimulated entrepreneurial activity remains insufficiently understood. As economic integration deepens across the continent and institutional quality gradually improves, one may expect cross-country disparities in the entrepreneurial environment to narrow. Future research could revisit the issues examined in this study using richer and more comprehensive entrepreneurship datasets, particularly those that better capture informal-sector entrepreneurship, which remains a defining feature of many African economies.

## Appendix

Table A1: Variable Description

| Variable Name | Definition | Source |
|---|---|---|
| **Dependent Variables** | | |
| TEA | TEA stands for total early-stage Entrepreneurship Activity. It is measured using as the % of 18-64 population who are either a nascent entrepreneur or new entrepreneurs as defined above. | Global Entrepreneurship Monitor Database |
| Firm Entry per capita | Definition 2 looks is firm entry per capita and is calculated as follows: new registered corporations during year *t* divided by population (entry per capita). | World Bank |
| Firm Entry (Number) | Number of newly registered corporations in a given year. | World Bank |
| **Independent Variables** | | |
| Liquid liabilities | The ratio of total liquid liabilities (M3) to GDP as a measure of financial sector size (Ndikumana, 2000). | World Development Indicators |
| Private Sector Credit | The ratio of total credit to the private to GDP. | World Development Indicators |
| Bank credit | The ratio of total domestic credit provided by the banking sector to GDP to measure the importance of banks in the supply of credit (Ndikumana, 2000). | World Development Indicators |
| FSD-pca | Composite financial development indicator based on principal components analysis (Ndikumana, 2000). | World Development Indicators |
| | | |
| **Institutional Quality Variables** | | |
| Voice | Voice and accountability | World Bank |
| Political stability | Political stability and absence of violence | World Bank |
| Governance | Governance Effectiveness | World Bank |
| Regulatory quality | Regulatory Quality | World Bank |
| Rule of law | Rule of Law | World Bank |
| Corruption-control | Control of Corruption | World Bank |
| IQ-pca | Composite institutional quality index based on principal components analysis. The composite index is based on the 6 World Governance Indicators. | World Development Indicators |
| Legal | Legal is an average of rule of law, regulatory quality, and control of corruption | |
| Political | Political is an average of voice and accountability, political stability, and government effectiveness | |
| | | |
| **Control Variables** | | |
| Trade openness | (Imports + Exports)/GDP | World Development Indicators |
| Population | Estimated population in a given country | World Development Indicators |
| Unemployment | Number | ILO and World Development Indicators |
| GDP per capita | Real annual GDP (US dollars) divided by the population in a given country. | World Development Indicators |
| Africa | A dummy variable taking a value of 1 if a country is from Africa and 0 if otherwise. | World Development Indicators |

**Table A2: Correlation Matrix**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) newfirms | 1.00 | | | | | | | | | | | | | | | |
| (2) newentryrate | 0.14** | 1.00 | | | | | | | | | | | | | | |
| | (0.02) | | | | | | | | | | | | | | | |
| (3) liquidity | 0.12* | 0.38*** | 1.00 | | | | | | | | | | | | | |
| | (0.06) | (0.00) | | | | | | | | | | | | | | |
| (4) bankcredit | 0.26*** | 0.38*** | 0.83*** | 1.00 | | | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | | | | | | | | | | | | | |
| (5) population | 0.58*** | -0.23*** | -0.11* | -0.06 | 1.00 | | | | | | | | | | | |
| | (0.00) | (0.00) | (0.05) | (0.32) | | | | | | | | | | | | |
| (6) unemp | 0.11* | 0.24*** | 0.19*** | 0.29*** | -0.15*** | 1.00 | | | | | | | | | | |
| | (0.10) | (0.00) | (0.00) | (0.00) | (0.01) | | | | | | | | | | | |
| (7) tradeopen | -0.20*** | 0.43*** | 0.33*** | 0.24*** | -0.37*** | 0.47*** | 1.00 | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | | | | |
| (8) gdppercapita | 0.25*** | 0.67*** | 0.45*** | 0.56*** | -0.14** | 0.58*** | 0.27*** | 1.00 | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) | (0.00) | (0.00) | | | | | | | | | |
| (9) fsd_pca | 0.12* | 0.38*** | 1.00*** | 0.83*** | -0.11* | 0.19*** | 0.33*** | 0.45*** | 1.00 | | | | | | | |
| | (0.06) | (0.00) | (0.00) | (0.00) | (0.05) | (0.00) | (0.00) | (0.00) | | | | | | | | |
| (10) corruptioncon~l | -0.01 | 0.61*** | 0.48*** | 0.55*** | -0.38*** | 0.39*** | 0.34*** | 0.47*** | 0.48*** | 1.00 | | | | | | |
| | (0.83) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | |
| (11) gvteffect | 0.11* | 0.56*** | 0.62*** | 0.72*** | -0.23*** | 0.40*** | 0.23*** | 0.57*** | 0.62*** | 0.87*** | 1.00 | | | | | |
| | (0.07) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | |
| (12) politstab | -0.21*** | 0.54*** | 0.29*** | 0.38*** | -0.63*** | 0.42*** | 0.41*** | 0.49*** | 0.29*** | 0.74*** | 0.64*** | 1.00 | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | |
| (13) regq | 0.14** | 0.61*** | 0.50*** | 0.68*** | -0.30*** | 0.32*** | 0.17*** | 0.55*** | 0.50*** | 0.80*** | 0.88*** | 0.70*** | 1.00 | | | |
| | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | |
| (14) ruleoflwa | -0.02 | 0.65*** | 0.56*** | 0.63*** | -0.39*** | 0.40*** | 0.35*** | 0.55*** | 0.56*** | 0.87*** | 0.91*** | 0.81*** | 0.88*** | 1.00 | | |
| | (0.73) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | |
| (15) voice | 0.09 | 0.52*** | 0.29*** | 0.46*** | -0.27*** | 0.38*** | 0.26*** | 0.41*** | 0.29*** | 0.65*** | 0.69*** | 0.69*** | 0.77*** | 0.75*** | 1.00 | |
| | (0.15) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | |
| (16) IQ_pca | -0.02 | 0.65*** | 0.56*** | 0.63*** | -0.39*** | 0.40*** | 0.35*** | 0.55*** | 0.56*** | 0.87*** | 0.91*** | 0.81*** | 0.88*** | 1.00*** | 0.75*** | 1.00 |
| | (0.73) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | |

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

Table A3: Developed country regressions results used to predict entrepreneurship gaps

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unemployment | -0.0112 | -0.0159** | -0.0132** | -0.0200*** | -0.0150*** | -0.0224*** | -0.0189** | -0.0217*** | -0.0250*** | -0.0134*** | -0.0196*** | -0.0188** | -0.0121** | -0.0094 |
| | (-1.5119) | (-2.1172) | (-2.5629) | (-3.9335) | (-2.8498) | (-4.3530) | (-2.4887) | (-4.1511) | (-4.7576) | (-2.6584) | (-3.9466) | (-2.4589) | (-2.3650) | (-1.2512) |
| Ln(Population) | 0.7735*** | 0.7808*** | 0.8042*** | 0.8211*** | 0.7954*** | 0.8102*** | 0.7440*** | 0.7747*** | 0.7684*** | 0.8108*** | 0.8255*** | 0.7662*** | 0.7760*** | 0.7466*** |
| | (10.7005) | (10.3537) | (12.7590) | (12.8086) | (12.5259) | (12.4514) | (8.9171) | (11.4882) | (10.8787) | (11.9899) | (12.1006) | (9.3804) | (11.9886) | (11.1819) |
| Ln(GDP per capita) | -0.0096 | 0.0171 | 0.0121 | 0.0251 | 0.0117 | 0.0244 | 0.0539** | 0.0620*** | 0.0625*** | 0.0269 | 0.0357** | 0.0565** | 0.0402** | 0.0095 |
| | (-0.4508) | (0.8039) | (0.7363) | (1.5423) | (0.7051) | (1.4767) | (2.3334) | (3.7687) | (3.6062) | (1.5518) | (2.0806) | (2.4971) | (2.5122) | (0.5041) |
| Trade openness | 0.0028*** | 0.0026*** | 0.0033*** | 0.0033*** | 0.0033*** | 0.0033*** | 0.0027*** | 0.0036*** | 0.0035*** | 0.0033*** | 0.0033*** | 0.0033*** | 0.0034*** | 0.0034*** |
| | (3.8677) | (3.5351) | (5.4024) | (5.3414) | (5.3714) | (5.2873) | (3.6084) | (5.6015) | (5.4889) | (5.3307) | (5.3927) | (4.4556) | (5.4871) | (4.6704) |
| Liquidity Liabilities | 0.0046*** | 0.0057*** | | | | | 0.0073*** | | | | | | | |
| | (3.5285) | (4.4142) | | | | | (5.5936) | | | | | | | |
| Legal | 0.6974*** | | 0.6815*** | | 0.6732*** | | | | | 0.6639*** | | | | |
| | (7.1048) | | (7.8224) | | (7.7046) | | | | | (7.9355) | | | | |
| Political | | 0.4954*** | | 0.5828*** | | 0.5770*** | | | | | 0.6212*** | | | |
| | | (5.2184) | | (6.8679) | | (6.7950) | | | | | (7.7618) | | | |
| Bank credit | | | 0.0015** | 0.0021*** | | | | 0.0028*** | | | | | | |
| | | | (2.1423) | (3.0816) | | | | (4.1085) | | | | | | |
| Financial Sector credit | | | | | 0.0013** | 0.0019*** | | | 0.0025*** | | | | | |
| | | | | | (2.3581) | (3.3386) | | | (4.3638) | | | | | |
| FSD-pca | | | | | | | | | | | | 0.2246*** | | 0.1712*** |
| | | | | | | | | | | | | (5.3820) | | (4.1269) |
| IQ-pca | | | | | | | | | | | | | 0.4736*** | 0.4953*** |
| | | | | | | | | | | | | | (7.6742) | (7.0893) |
| Constant | -3.8630*** | -4.2523*** | -4.3787*** | -4.7235*** | -4.2306*** | -4.5383*** | -4.1445*** | -4.3784*** | -4.2751*** | -4.6109*** | -4.8518*** | -4.0962*** | -4.0137*** | -3.2013*** |
| | (-3.2577) | (-3.4483) | (-4.2296) | (-4.4985) | (-4.0620) | (-4.2623) | (-3.0246) | (-3.9465) | (-3.6848) | (-4.1538) | (-4.3385) | (-3.0319) | (-3.7653) | (-2.8793) |
| Observations | 655 | 655 | 807 | 807 | 806 | 806 | 655 | 807 | 806 | 836 | 836 | 654 | 836 | 654 |

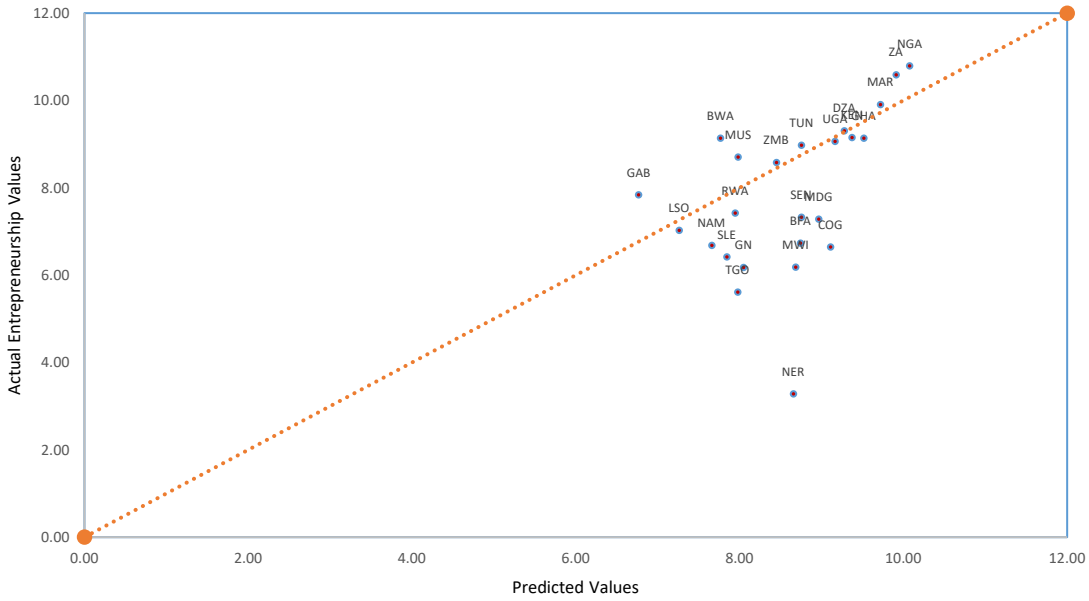
Notes: t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1%. The dependent variable is the log of the number of new firms. *Africa* is a binary variable taking the value 1 if the country is in Africa, 0 otherwise; *IQ-pca, FSD-pca* are the institutional quality and financial sector development indices that are constructed based on principal component analysis. Legal is an average of rule of law, regulatory quality, and control of corruption; Political is an average of voice and accountability, political stability, and government effectiveness. *Corruption control, gov effectiveness, Political stability, regulatory quality, rule of law and voice* are the six world governance indicators (namely: control of corruption, government effectiveness, political stability and absence of violence and terrorism, regulatory quality, rule of law, and voice and accountability as developed by Kauffmann, Kraay and Mastruzzi (2009).

Table A4: Determinants of Entrepreneurship in Africa (using TEA as a dependent Variable)

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unemployment | 2.0064** | 2.0363** | 1.9913** | 2.1745** | 2.9745*** | 2.0363** | 0.3852 | 0.2514 | 2.0740** | 2.0680** | 2.0779** | 2.0825** | 2.0064** | 2.0566** |
| | (2.2201) | (2.2668) | (2.1573) | (2.3583) | (3.2195) | (2.2668) | (0.7272) | (0.4560) | (2.4008) | (2.3070) | (2.3438) | (2.3062) | (2.2201) | (2.3151) |
| Ln(population) | -75.2554* | -76.5597* | -75.4029* | -77.3957* | -102.2011** | -76.5598* | -2.5665 | 0.7503 | -92.5449** | -81.5439* | -72.4075 | -82.7118* | -75.2554* | -67.1657 |
| | (-1.7558) | (-1.7887) | (-1.7252) | (-1.8191) | (-2.5052) | (-1.7887) | (-0.6348) | (0.1909) | (-2.1672) | (-1.8550) | (-1.7075) | (-1.8063) | (-1.7558) | (-1.5287) |
| Ln(gdppercapita) | 74.5209* | 73.7345* | 76.0037* | 70.8980* | 79.5247** | 73.7347* | -5.1063 | -6.1047 | 75.8003** | 73.7007* | 61.9322 | 74.2271* | 74.5209* | 64.9260 |
| | (1.9960) | (1.9805) | (1.9784) | (1.9142) | (2.3404) | (1.9805) | (-1.1545) | (-1.3516) | (2.1233) | (1.9949) | (1.5958) | (2.0006) | (1.9960) | (1.7001) |
| Trade opennes | -0.1371 | -0.1290 | -0.1365 | -0.1322 | -0.1252 | -0.1290 | -0.0029 | 0.0077 | -0.1384 | -0.1432 | -0.0939 | -0.1255 | -0.1371 | -0.1022 |
| | (-1.2658) | (-1.2102) | (-1.2355) | (-1.2510) | (-1.2900) | (-1.2102) | (-0.0350) | (0.0905) | (-1.3523) | (-1.3143) | (-0.8291) | (-1.1747) | (-1.2658) | (-0.9174) |
| IQ_pca | -2.0519 | | -2.7021 | | | | | | | | | | | |
| | (-0.2998) | | (-0.3683) | | | | | | | | | | | |
| FSD_pca | | -1.3544 | -2.2350 | | | | | | | | | | | |
| | | (-0.1867) | (-0.2879) | | | | | | | | | | | |
| Bank credit | | | | 0.1289 | | | | | | | | | | |
| | | | | (0.5843) | | | | | | | | | | |
| Pvt sector credit | | | | | 0.2647** | | | | | | | | | |
| | | | | | (2.1980) | | | | | | | | | |
| Liquidity liabilities | | | | | | -0.0596 | | | | | | | | |
| | | | | | | (-0.1868) | | | | | | | | |
| Legal | | | | | | | -9.3448 | | | | | | | |
| | | | | | | | (-1.2506) | | | | | | | |
| Political | | | | | | | | 1.9667 | | | | | | |
| | | | | | | | | (0.2330) | | | | | | |
| Corruption control | | | | | | | | | -8.3612 | | | | | |
| | | | | | | | | | (-1.4147) | | | | | |
| Gvt Effectivness | | | | | | | | | | -4.6249 | | | | |
| | | | | | | | | | | (-0.4851) | | | | |
| Political Stability | | | | | | | | | | | 4.6403 | | | |
| | | | | | | | | | | | (0.8566) | | | |
| Regulatory quality | | | | | | | | | | | | -3.9024 | | |
| | | | | | | | | | | | | (-0.3874) | | |
| Rule of law | | | | | | | | | | | | | -3.4326 | |
| | | | | | | | | | | | | | (-0.2998) | |
| Voice | | | | | | | | | | | | | | -3.4701 |
| | | | | | | | | | | | | | | (-0.7649) |
| Constant | 693.0157 | 719.8510 | 684.6899 | 749.9200 | 1,082.2401** | 721.9290 | 99.2881 | 54.7285 | 974.1189** | 805.0905 | 741.2930 | 819.4971 | 691.4665 | 626.9808 |
| | (1.5220) | (1.6104) | (1.4719) | (1.6770) | (2.4585) | (1.6145) | (1.4277) | (0.8313) | (2.0910) | (1.6820) | (1.6795) | (1.5915) | (1.5152) | (1.3680) |
| | | | | | | | | | | | | | | |
| Observations | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 |
| R-squared | 0.20 | 0.20 | 0.21 | 0.21 | 0.33 | 0.20 | | | 0.26 | 0.21 | 0.22 | 0.21 | 0.20 | 0.22 |

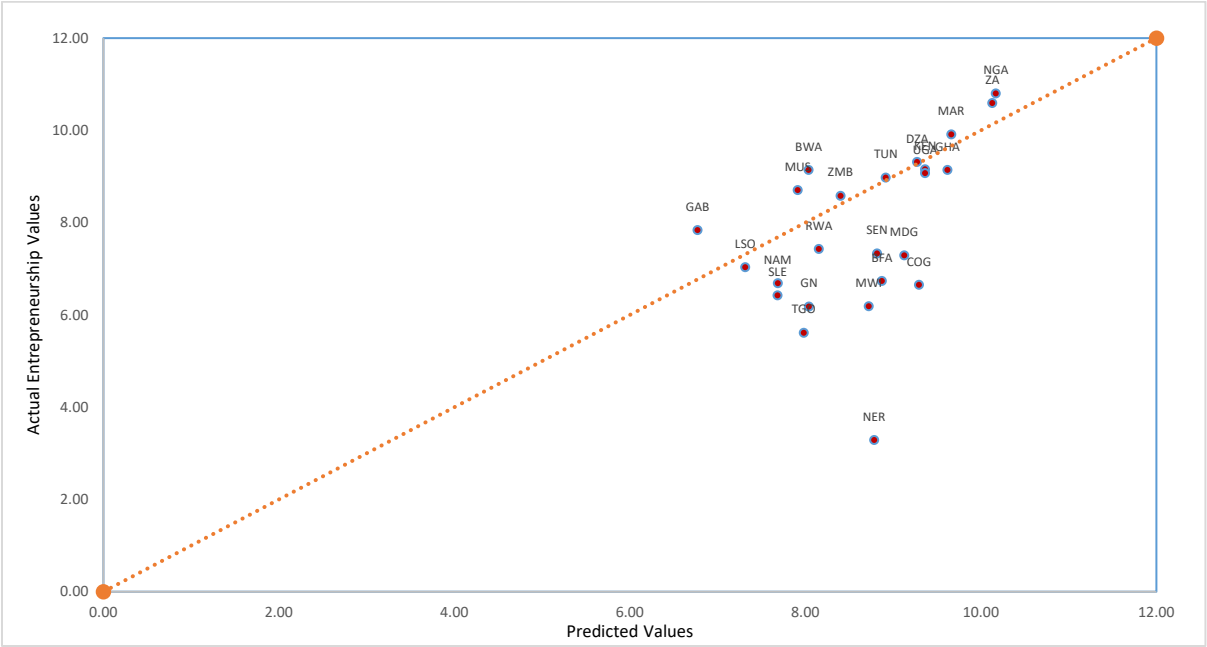
Notes: t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1%. TEA stands for total early-stage entrepreneurship activity. It is measured as the % of 18-64 population who are either nascent or new entrepreneurs. *Africa* is a binary variable taking the value 1 if the country is in Africa, 0 otherwise; *IQ-pca, FSD-pca* are the institutional quality and financial sector development indices that are constructed based on principal component analysis. Legal is an average of rule of law, regulatory quality and control of corruption; Political is an average of voice and accountability, political stability and government effectiveness. *Corruption control, gov effectiveness, Political stability, regulatory quality, rule of law and voice* are the six world governance indicators (namely: control of corruption, government effectiveness, political stability and absence of violence and terrorism, regulatory quality, rule of law, and voice and accountability as developed by Kauffmann, Kraay and Mastruzzi (2009).

Figure A1: Entrepreneurship in Africa Actual Versus Potential



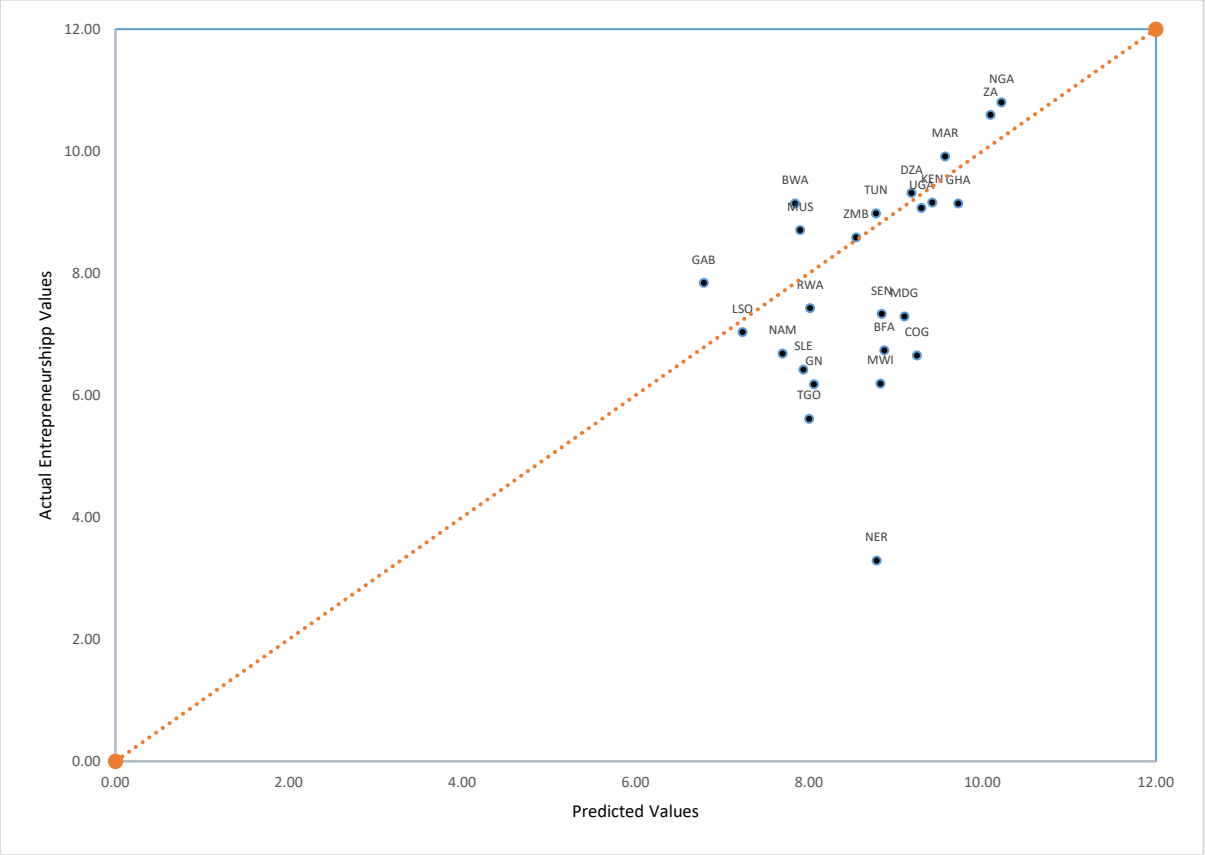

Notes: *Liquidity liabilities* and *legal* were used as financial sector development (FSD) and institutional quality (IQ) measures, respectively. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A2: Entrepreneurship in Africa Actual Versus Potential



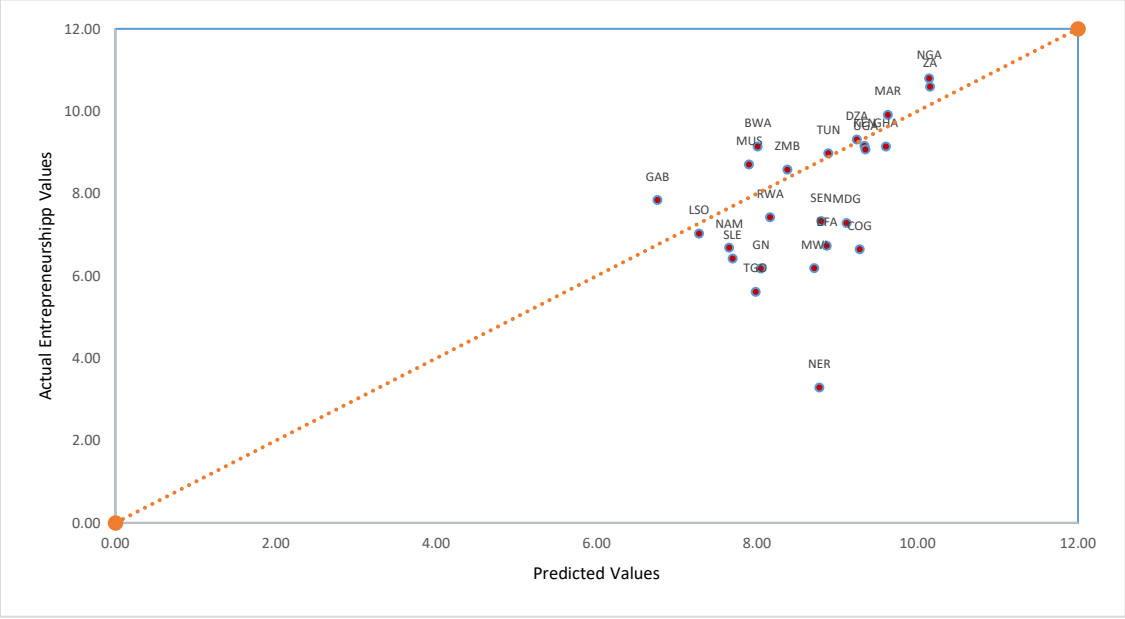

Notes: *Bank credit* and *Legal* were used as measures of FSD and IQ, respectively. Unemployment, population, GDP per capita and trade openness were used as control variables.

Figure A3: Entrepreneurship in Africa Actual Versus Potential



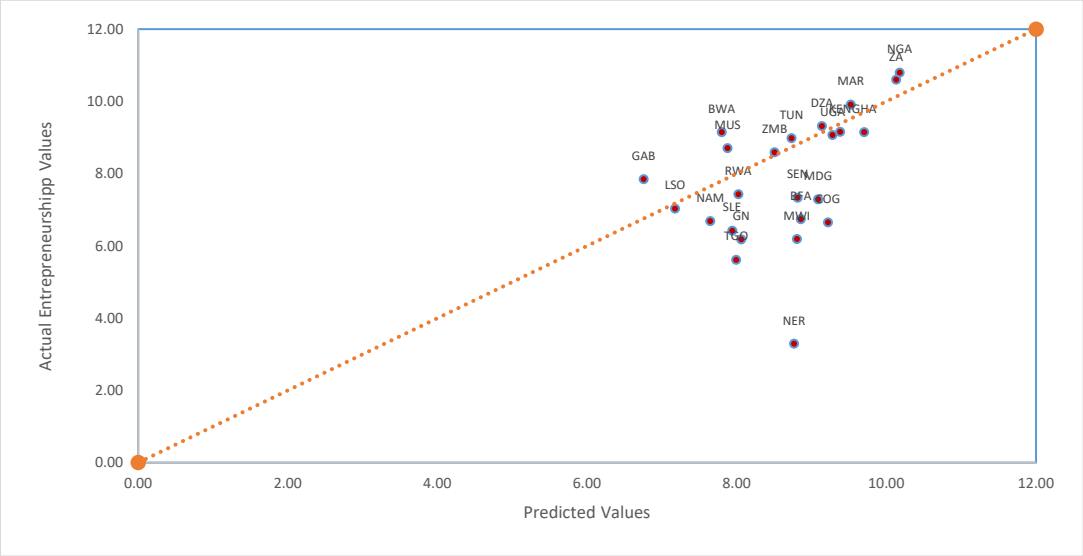

Notes: *Bank credit* and *political factors* were used as measures of FSD and IQ, respectively. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A4: Entrepreneurship in Africa Actual Versus Potential



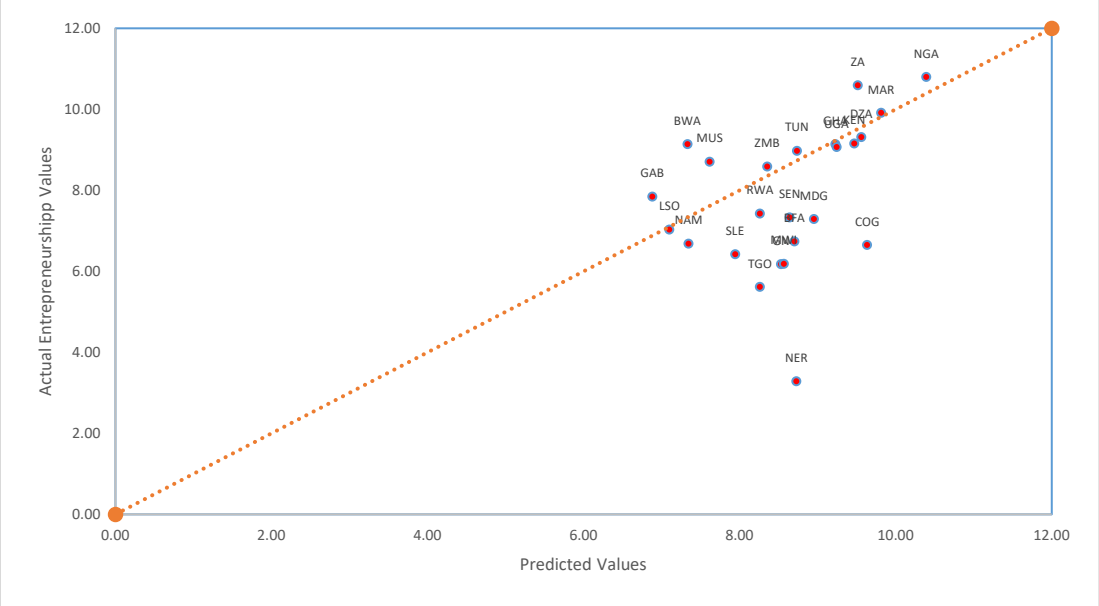

Notes: *Financial sector credit* and *Legal* were used as measures of FSD and IQ, respectively. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A5: Entrepreneurship in Africa Actual Versus Potential



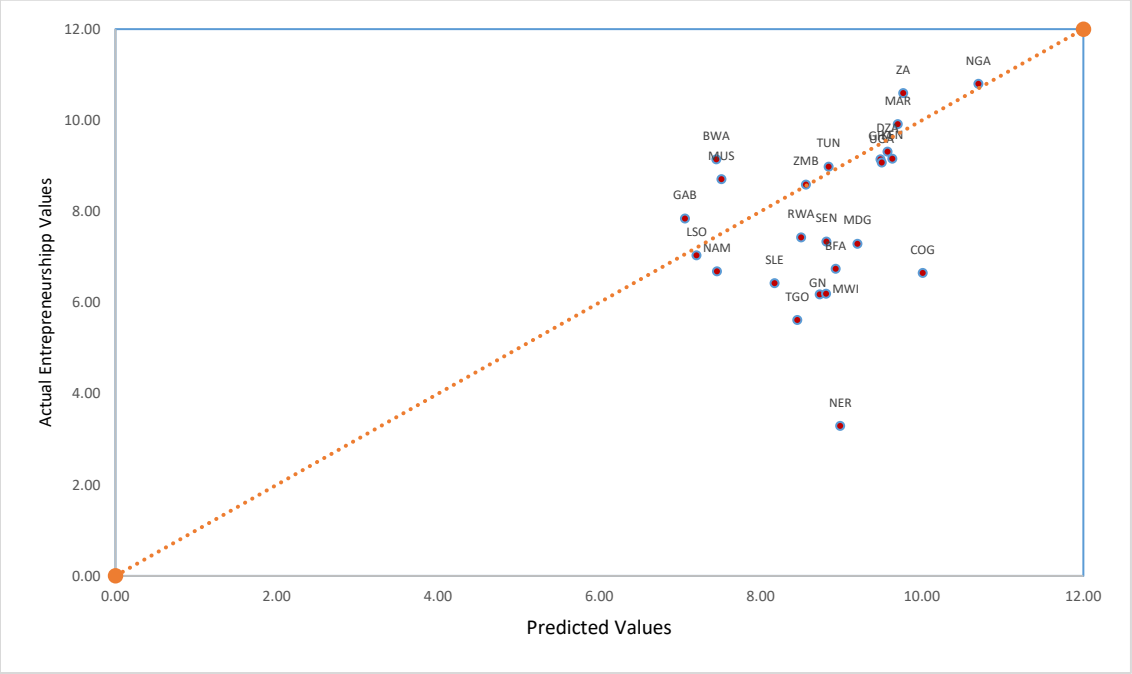

Notes: *Private sector credit* and *political factors* were used as measures of FSD and IQ, respectively. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A6: Entrepreneurship in Africa Actual Versus Potential



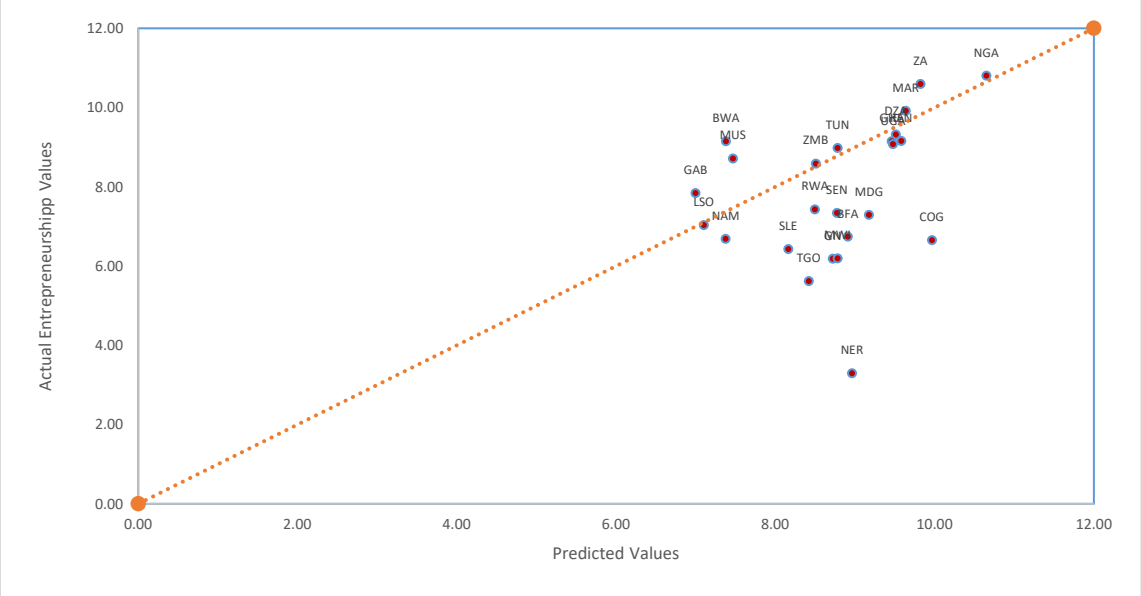

Notes: Only the liquidity-to-liabilities ratio (as a measure of financial sector development) was used. No institutional quality indicator was used. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A7: Entrepreneurship in Africa Actual Versus Potential



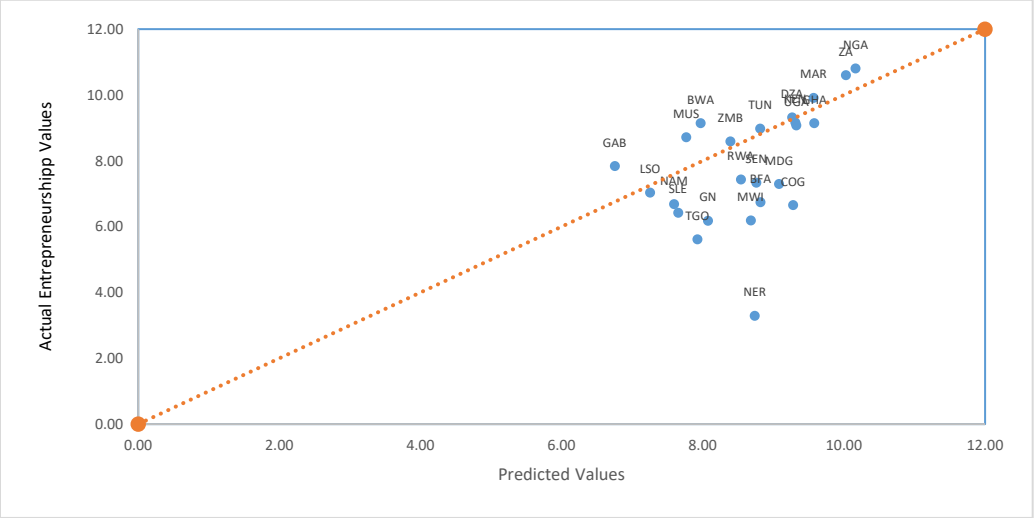

Notes: Only Bank credit, as a measure of FSD, was used. No institutional quality indicator was used. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A8: Entrepreneurship in Africa Actual Versus Potential



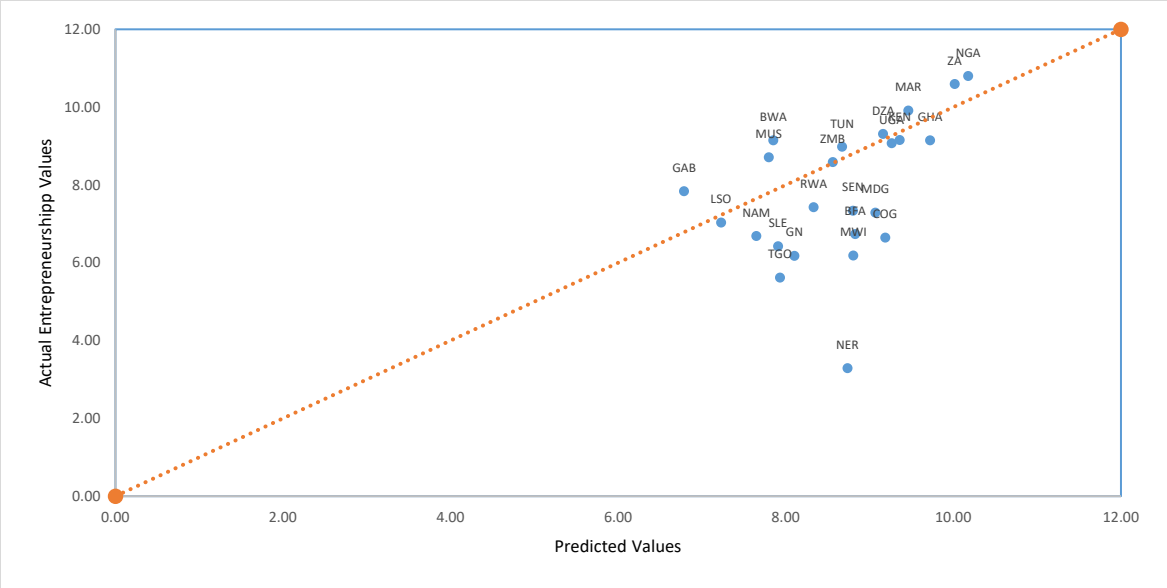

Notes: Only *financial sector credit* was used as a measure of FSD. No institutional quality indicator was used. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A9: Entrepreneurship in Africa Actual Versus Potential




Notes: Only *Legal* was used as a measure of IQ, and no institutional quality indicator was used. Unemployment, population, GDP per capita, and trade openness were used as control variables.

Figure A10: Entrepreneurship in Africa Actual Versus Potential




Notes: Only *Political* was used as a measure of IQ, and no FSD indicator was used. Unemployment, population, GDP per capita, and trade openness were used as control variables.

## References


Acs, Z. (2006). How is entrepreneurship good for economic growth? *Innovations,* Winter: 97-107.

African Development Bank. (2025). *African Economic Outlook 2025: Making Africa's capital work better for Africa's development*. African Development Bank Group.

African Development Bank (2011). *African Development Report 2011: Private Sector Development as an Engine of Africa's Economic Development*. African Development Bank Group, Tunisia. Allen, F., Carletti, F., Cull, R., Qian, J., Senbet, L., and Valenzuela, P. (2013). Resolving the African Financial Development Gap: Cross-Country Comparisons and a Within-Country Study of Kenya. *World Bank Working Paper Number 6592*. World Bank, Washington D.C.

Allen, F., Babus, A. and Carlettie, E. (2009). Financial crisis: theory and evidence. *Annual Review of Financial Economics*, 1: 97-116.

Amine, R., Zhang, Q., Hakobyan, S., & Goel, A. (2025). *Bottlenecks to private sector development in Sub-Saharan Africa: A firm-level analysis.* IMF Working Paper No. WP/25/188. International Monetary Fund. https://doi.org/10.5089/9798229023740.001

Armington, C., & Acs, Z. J. (2002). The Determinants of Regional Variation in New Firm Formation. *Regional Studies*, *36*(1): 33–45. https://doi.org/10.1080/00343400120099843

Audretsch, D. B. and Fritsch, M. (1994). The geography of firm births in Germany. *Regional Studies* 28(4): 359-366. https://doi.org/10.1080/00343409412331348326

Bowen, H.P., De Clercq, D. (2008). Institutional context and the allocation of entrepreneurial effort. *Journal of international Business Studies* 39 (4), 747-767.

Brixiova, Z., Ncube, M., and Bicaba, Z. (2015). Skills and youth entrepreneurship in Africa: Analysis with evidence from Swaziland. *World Development* 67: 11-26.

Desai, M., Gompers, P., Lerner, J., 2003. Institutions, capital constraints and entrepreneurial firm dynamics: evidence from Europe. Unpublished working paper. National Bureau of Economic Research.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2002. The regulation of entry. *Quarterly Journal of Economics* 117, 1–35.

Fogel, K., Hawk, A., Morck, R. and Yeung, B., 2006. Institutional obstacles to entrepreneurship. In: Casson, M., Yeung, B., Basu, A., Wedeson, N. (Eds.), *The Oxford Handbook of Entrepreneurship*. Oxford University Press, Oxford, pp. 540–579.

Garofoli, G. (1994). New firm formation and regional development: the Italian case. *Regional Studies* 28(4): 381-394. https://doi.org/10.1080/00343409412331348346

Garofoli, G. (1994). New Firm Formation and Regional Development: The Italian Case. *Regional Studies*, *28*(4), 381–393. https://doi.org/10.1080/00343409412331348346

Haltiwanger, J., R. Jarmin, and Miranda, J. (2009). Jobs created from business startups in the United States. *Kauffman Foundation*, January 2009.

Johnson, S., Kaufmann, D., and Zoido-Lobatón, P. (1998). Regulatory Discretion and the Unofficial Economy. *American Economic Review*, 88(2): 387-392.

Kelley, D., Singer, S. and Herrington, M. (2016). *Global Entrepreneurship Monitor 2015/16* Global Report.

King, R. G. and Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108(3): 717-737.

Klapper, L., Singer, D., Starita, L., and Norris, A. (2025). *The Global Findex Database 2025: Connectivity and Financial Inclusion in the Digital Economy*. Washington, DC: World Bank. doi:10.1596/978-1-4648-2204-9.

Klapper, L., Laeven, L. and Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics*, 82: 591–629.

Levie, J., Autio, E. (2011). Regulatory burden, rule of law, and entry of strategic entrepreneurs: an international panel study. *Journal of Management Studies* 48 (6), 1392-1419.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature, 35*(2): 688-726.

Ndikumana, L. (2000). Financial determinants of domestic investment in Sub-Saharan Africa: Evidence from Panel Data. *World Development*, 28(2): 381-400.

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.

Obstfeld, M. (1994). Risk-taking, global diversification and growth. *The American Economic Review*, 84(5): 1310-1329.

Rajan, R. G. and Zingales, L. (1998). Financial dependence and growth. *American Economic Review* 88(3): 559-586.

Rajan, R. R. and Zingales, L. (2004). *Saving Capitalism from the Capitalists: Unleashing the power of financial markets to create wealth and spread opportunity*. Princeton University Press.

Ramachandran, V., Gelb, A. and Shah, M. K. (2009). *Africa's private sector: What's wrong with the business environment and what to do about it*. Centre for Global Development. Washington D.C.

Reynolds, P. (1994). Autonomous firm dynamics and economic growth in United States, 1986 – 1990. *Regional Studies,* 28(4): 429-442. https://doi.org/10.1080/00343409412331348376

Revelli, R. and Silvana, P. (1989). The determinants of new firm formation in Italian manufacturing. *Small Business Economics* 1(3): 181-191.

Stampini, M., Leung, R., Diarra, S. M. and Pla, L. (2011). How large is the private sector in Africa? Evidence from National Accounts and Labour Markets. *IZA Working Paper Nu*mber 6267.

Sutaria, V., & Hicks, D. A. (2004). New firm formation: Dynamics and determinants. *The Annals of Regional Science,* 38(2): 241-262.

Wang, S. (2006). Determinants of new firm formation in Taiwan. *Small Business Economics,* 27: 313-321.

World Bank (2015). The Global Findex database 2014: Measuring Financial Inclusion around the World. *World Bank Policy Research Working Paper* 7255.

World Bank (2016). *Doing Business 2016: Measuring Regulatory Quality and Efficiency*. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-0667-4.




# Mission

To strengthen local capacity for conducting independent,
rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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- Improve quality.
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