

# Business Constraints and Firm Exit in Developing Countries: Evidence from Nigeria

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## Research Article

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# Abstract

This study examines the impact of business constraints on firm exit using harmonized dataset of panel firms from the World Bank Enterprise Survey in Nigeria. It applies a confirmatory methodology – factor analysis to aggregate 15 firm-level indicators of business constraints into an index scale and estimates firm likelihood of exit from the market using binary probit model. Findings suggest that firm exit in Nigeria is not determined by current level of constraints in the business environment; however, additional level of constraints will result to more firms exiting the market. This finding holds true in the entire model specifications; that is, with and without accounting for firms' differences or demographics, the squared business constraint index has a significant positive association with firm exit. By implication, addressing constraints in the business environment can improve business survival prospect and in return contribute to national development. Therefore, it is imperative that policymakers in developing countries like Nigeria should gear more efforts towards improving business environment in their economies through carefully designed policies that can foster private sector development.

## I. Introduction

The private sector remains the main engine of development for every economy and most importantly for developing countries. It absorbs the unemployed human capital (labour) and plays meaningful role towards reducing global poverty. This explains the efforts, energy and resources that are being put in place by researchers, think tanks, and development institutions to promote private sector development in developing countries through various projects and programs. An example is the Business Enabling Environment (BEE) Project by the World Bank. The new project provides new methodology for assessing global business environment with the goal to foster private sector development (World Bank, 2022).

It is a well known fact that private sector's growth is driven by innovation and entrepreneurship behaviour of individual entrepreneur; however, the business environment goes a long way to influence the sector's development through several factors such as government regulations and policies, institutional quality, variations in macroeconomic environment, infrastructure, market structure or composition, etc; with developing countries known to have most deteriorating business environment that impedes business operations. A comparison study of Africa and the rest of the world, Aterido and Hallward-Driemeier (2010) observed that investment climate conditions in Sub-Sahara African are more challenging than the rest of the world; while Geginat and Ramalho (2015), on the other hand, revealed that the time to obtain a new electricity connection in low-income countries is twice of what is obtainable in high-income countries, with a cost that is 70 times higher.

Nigeria, despite being the largest economy in Africa is faced with diverse challenges in her business environment. The country's business environment is ranked 131th out of 190 nations by the World Bank Ease of Doing Business in 2020. Numerous challenges confront the country's business environment with insecurity as the most pressing obstacle. The northern region of the country has witnessed decade of terrorist attacks by bandits and militant Islamist Boko Haram group (Whiting 2019). Similar to that, the

Niger Delta region that houses the nation's oil wells is faced with conflict attacks from the Niger delta militants; coupled with other crimes like kidnapping, police brutality, farmers/herdsmen conflict that are prevalent in other parts of the country. The country's public institutions are not without its own challenge; marked by high level of inefficiency, corruption, and lack of technical dynamism. In the same vein, inefficient infrastructure has over the years remained the major challenge to the country's prospect for development (Federal Republic of Nigeria 2017). The country's infrastructure is ranked 130th out of 138 countries in 2019 Global Competitiveness Index; with utility and transport infrastructure ranking 124th and 130th respectively (Schwab 2019). Also, the World Bank enterprise survey noted insufficient infrastructure as one of the major hindrances to business operation in Nigeria (Nigeria Enterprise Survey, 2014).

Figure 1 displays a snapshot of Nigeria's business and investment climate. The first part of the diagram (panel A) shows Nigeria's score on selected variables. The value of the score ranges from 0 (lowest performance) to 100 (best performance). The data are sourced from two respective sources; the Global Innovation Index and World Development Indicators.

[Insert Fig. 1]

The first panel of Fig. 1 shows that Nigeria's business environment in the areas of *cost of redundancy dismissal* and *ease of starting a business* has improved in recent years; with both indicators having their score values above 70. In most recent time, between 2016 and 2020, indicators like *rule of law*, *regulatory environment*, and *government effectiveness* have their score values below 30. This shows that the country's institutional environment is marked with some level of weakness in recent time. The second panel shows a gradual improvement in *ease of doing business* in Nigeria.

There is no doubt that the deplorable state of business environment in Nigeria has hampered firms' activities in several ways. Among the early studies on Nigeria's business environment like Adenikinju (2003) argued that the poor power supply in Nigeria has made many start-ups enterprises to spend equivalently 20–30 percent of their initial investment on costly self-generation in their bid to mitigate cost of frequent outages. Similarly, Okechukwu (2012) provided evidence for the cost of power failures on manufacturing firms' capacity utilization in Nigeria. The World Bank (2014) Enterprise Survey in Nigeria likewise identified obvious factors that hamper firms' performance such as access to finance, corruption, stifling business regulations, crime, inadequate workforce, political instability, informal competition, and inadequate infrastructure (Nigeria Enterprise Survey 2014). Figure II shows the percentage of Nigerian firms in two rounds of the enterprise surveys (2007 and 2014) that identify a particular factor as biggest obstacle to their operation in comparison with other Sub-Saharan Africa countries.

[Insert Figure II]

Compared to other Sub-Sahara African countries, Nigeria has the least percentage of firms identifying *Court; Crime, Theft and Disorder; Custom and Trade Regulation; Inadequate Educated Workforce; Political Instability; Informal Sector; Tax Administration; and Tax Rate* as biggest challenge to their operation.

However, worrisome challenges exist in other areas and looms the largest in *Access to Finance* and *Electricity*. About 30.2 percent of the surveyed firms in 2014 identified *Access to Finance* as biggest constraint to their operation against 15.5 percent in 2007. Likewise, 63.6 percent of the surveyed firms in 2007 identified electricity as the biggest obstacle to their operation; a value that is many times higher than that of other African nations. By 2014, the percentage of firms identifying electricity as biggest obstacle reduced to 27.2 percent which signals an improvement in the country's electricity sector.

There are number of existing studies that have assessed the effect of different dimensions of the business constraints on firms' performance and growth. An increasing number of them examined the effect of infrastructure on firms' performance (Fakih et al. 2020; limi 2011; Abdisa 2019; Geginat and Ramalho 2015; Escribano et al. 2010; limi et al. 2015; and Rentschler et al. 2019); others examined the importance of access to finance on firm productivity (Essmui et al. 2014; Aterido et al. 2009; Ayyagari et al. 2006; Amin and Viganola 2021; Bahy and Cooper 2012; Aterido and Hallward-Driemeier 2010); while several number of them investigated the role of institutions and regulatory environment (Yang 2017; Ayyagari et al. 2014; Klapper et al. 2010); bribery and corruption (Amin and Ulku 2019; Hallward-Driemeier and Rijkers 2014; Amin and Motta 2021) on enterprise development.

Generally, these studies conclude that unfriendly business environment harms firm productivity; raises costs and risks of doing business; and creates barriers to competition. However, studies that examine the impact of business environment on firm survival/exit appear to be sparse in literature (with exception of Iwasaki et al. 2021; Klapper and Richmond 2011; Muzi et al. 2021; Orjiakor and Omeje 2022), even though the possibility abounds that business constraints can impede firm survival prospect. Most empirical literature on business survival provided evidence for the impact of internal factors on firm survival (e.g. Esteve-Pérez and Manñez-Castillejo 2008; Dunne and Masenyetse 2015; Aga and Francis 2015; Esteve-Pérez and Sahiti 2019). It is against this background that this paper set out to investigate the impact of business constraints on firm exit using firm-level measures of business constraints from the World Bank Enterprise Survey. It maintains that firms faced with business constraints remain susceptible to exit risk from the market.

The reminder of this paper is arranged as follows: section II reviews empirical literature related to this study; section III gives attention to the methodology and data source used in the study; section IV discusses the analytical results; and section V provides the concluding remarks.

## **II. Literature Review**

Existing business climate literature provided evidence for the effect of business constraints such as infrastructure, finance, institutions, corruption, and business regulation on firm performance and growth. Talking about infrastructure such as electricity, several studies argued that adequate and reliable electricity matters for firm performance. For example, Fakih et al. (2020) uses measures of firm performance such as sales, employment, and productivity growth rates to examine the impact of power outages on manufacturing firms' performance in the Middle East and North Africa region using data from

the World Bank enterprise survey. The study provided evidence that power outages in all its forms have adverse effect on manufacturing firm performance and much evident in sales and labour productivity growth rates. Similarly, limi (2011) established that frequent electrical outages increase corporate costs for enterprises in 26 transition economies in Eastern Europe and Central Asia; while Abdisa (2019) discovered that investing in self-generation reduces outage loss for firms that invest in self-generation, although such firms continue to experience greater unmitigated outage loss than their counterpart (firms that did not invest in self generation). On the other hand, Geginat and Ramalho (2015) identified level of bureaucracy in low-income countries to be significant factor that explains inefficiency in utilities distribution in these countries, and support the premise that electricity connectivity matters for firm performance. The study indicated that firms that face smaller and less costly electricity connection processes have better performance and most especially in sectors with high needs for electricity.

Related studies examined the general impact of infrastructure quality on business performance. Findings from Escribano et al. (2010) for manufacturing enterprises in 26 African countries established that infrastructure quality has a high negative impact on low-income countries' total factor productivity and a minor positive influence on high-income countries' total factor productivity; while limi et al. (2015) revealed that infrastructure quality are essential for enhancing enterprise productivity in selected five East African countries. Rentschler et al. (2019), on the other hand, estimated the monetary cost of unreliable infrastructure for firms in 137 low- and middle-income nations to be around \$300 billion each year, with annual utilization losses of \$151 billion.

Another body of literature channeled concern to the institutional aspect of business environment, specifically governance, regulation and corruption, and determine their impact on firm growth and performance, and access to credit and public utilities. For example, Yang (2017) used firm-level data for small and medium enterprises in Latin America and the Caribbean region to provide evidence that weak environment reduces the performance of innovative SMEs compared to their counterpart. In the same vein, Amin and Ulku (2019) used firm data for more than 39,000 enterprises in 111 countries to show that corruption adversely affect firm productivity and highly significant in times of high regulation. Ayyagari et al. (2014) provided evidence that innovative firm especially those in countries with excessive bureaucratic regulations and weak governance institutions are more likely to face rent seeking from government officials and still does not face better service delivery. In the same vein, Freund et al. (2014) showed that contrarily to popular opinion that demand for bribe is associated with quick service delivery, the amount of time to secure an operating license, building permit, or electrical connection is 1.5 times longer for firms that are faced with bribes demands than their counterpart (firms that are not faced with bribe demands); 1.2 times longer to clear customs when exporting; and 1.4 times longer when importing. Amin and Motta (2021) also established evidence that corruption in developing countries limits SMEs access to credit in a strong way and estimated that every increase in bureaucratic corruption, say from the minimum to maximum value, SMEs chances of being financially constrained increases from 6.9 to 10.9 percentage points.

In addition to some of the mentioned constraints, factors such as access to finance, competition from informal sector, crime, etc are as well recognized in business literature as key predictors of business success. For example, Essmui et al. (2014) applied method of Structural Equation Model (SEM) to analyze the impact deplorable business environment on manufacturing firms' employment growth using enterprise data of 207 enterprises operating in three commercial cities of Libya. The study identifies lack of finance, crime, human capital, corruption, and infrastructure to be significant factors that obstruct employment growth of firms in Libya, but fail to obtain evidence for the effect of competition and business regulations on firms' employment growth. Similarly, Aterido et al. (2009) used enterprise data for more than 56,000 establishments in developing and high-income economies to study the effects of the business environment, mainly infrastructure, access to credit, corruption, and business regulations on firms' employment growth while accounting for heterogeneity across firm size. Evidence from the study indicated that employment growth rate for medium and large firms is adversely affected by lack of access to credit and deplorable infrastructure, while that of small firms is mostly affect by business regulations.

In similar study, Klapper et al. (2010) provided evidence that formal sector growth measured by firm entry and density rates are robustly related to measures of country's economic growth and development, level of legal and institutional (regulatory) development, ease of access to finance, and activities of the informal sector. Further evidence from the study supports the premise that business environment proxy by ease of starting a business and political corruption are significant predictors of the number of firm registrations. Applying methods of regression analyses and Directed Acyclic Graph methodology, Ayyagari et al. (2006) provided evidence that business constraints pertaining to finance, political instability, and crime are binding constraints that have direct influence on firm growth, with finance having the largest impact. Ullah (2020) also indicated that inadequate finance has adverse effect on sales and employment growth of SMEs in 28 Eastern European and Central Asian countries after accounting for differences in countries level of development, institutional quality, and corruption. Amin and Viganola (2021) obtained similar evidence that firms with access to finance before the Covid-19 pandemic have lower likelihood of experiencing decreased sales during the pandemic; while Bahy and Cooper (2012) identify lack of access to credit and degree of competition as major constraints limiting income growth of small firms in Northern Myanmar.

Aterido et al. (2007) examined the impact of credit access, business regulation, corruption, and infrastructure on employment growth of 70,000 firms in 107 countries and found evidence of composition effects of business environment on firm employment growth, suggesting that weak business climate adversely affect employment growth of firms. The effects of access to finance and regulation reduce employment growth of all enterprises, most especially, micro and small enterprises; while corruption and deplorable infrastructure reduce employment growth of medium and large enterprises. In a comparison study of Africa and the rest of the world, Aterido and Hallward-Driemeier (2010) assessed how access to credit, infrastructure, regulatory environment, and corruption affect patterns of employment growth in Sub-Sahara Africa using World Bank Enterprise Survey for 104 countries including 31 Sub-Sahara African countries. The authors argued that despite the fact that Sub-

Sahara African has a challenging investment climate than the rest of the world; it does not translate to low employment growth. Instead, more of the major constraints; particularly, access to finance and infrastructure translate to expanding micro enterprises. The effect of power outages is found to lower employment growth of large firms in the region but promotes employment growth of micro firms.

Another body of literature took a different approach to examine the impact of business environment on firm entry and choice of entry. For example, Klapper et al. (2004) used firm-level data for Western and Eastern Europe to establish evidence that entry regulations hampers rate of firm entry and more evident in sectors that naturally should have high rate of entry, which further translates to lower output per worker in the sector especially for countries with burdensome regulations on entry. In the same manner, Klapper et al. (2009) used data from business registries to establish evidence that better governance and lesser burden in starting a business such as a fast, efficient, and cost-effective business registration process are important factors that drive entrepreneurship activity in the formal sector. Also, Klapper and Love (2010) used longitudinal data on new firm registrations in 91 countries to show that the number of new firm registrations is significantly determined by the required costs, days and procedures of starting a business.

Studies that have examined the impact of business environment on firm survival or exit appears to be scarce in literature with exception of very few. Studies like Orjiakor and Omeje (2022) provided evidence for the effect of infrastructure deficit on firm survival in Nigeria using data from World Bank Enterprise Survey. The study asserted that firms with improved access to infrastructure such as electricity, telecommunication, transportation, and quality institutional services have better chances to survive than those without such access. Hallward-Driemeier (2007) used dataset of enterprises operating in 27 Eastern European and Central Asian countries to establish that inefficiencies in business environment, specifically access to credit, efficiency of public services, corruption, level of competition, and strength of property rights are associated with higher risk of business exit. Similarly, Iwasaki et al. (2021) supported the premise that quality institutions and developed financial system help improve firm longevity, using dataset of 94,401 small enterprises in 17 European emerging markets from 2007–2017. In the same manner, Klapper and Richmond (2011) used data of registered businesses in Cote d'Ivoire for the period 1976–1997 to show that the risk of firm exit increases with types of reforms, while firm likelihood of survival increases monotonically with firm size and better economic performance; while Muzi et al. (2021) established that excessive regulation proxy by the amount of time senior executive spent dealing regulatory requirements increases the risk of firm exit during the Covid-19 pandemic.

Following an extensive review of literature, it appears that there is gap in literature to be filled in the area of business constraints and firm survival/exit especially in the context of developing countries. In other to bridge this gap in knowledge and contribute to literature, this study presents a new evidence for the impact of business constraints on firm risk of exit in developing using Nigeria as a case study.

## **iii. Methodology**

### Data Source

This paper utilises the harmonized dataset of Nigeria Enterprise Survey by the World Bank during the period 2007–2014. The Enterprise Surveys provide firm-level data on business and investment climate in 151 countries (Enterprise Survey, World Bank 2022). The surveys are representative sample of an economy's private sector and contained broad array of indicators that are use to study business environment such as infrastructure, corruption, finance, competition, crime, and performance indicators (Enterprise Survey, World Bank 2022). The availability and the unique qualities of the dataset make it the most suited dataset for this study. To the best of the author's knowledge, the Nigeria Enterprise Survey dataset is the only available dataset that provides firm-level data that is representative sample of the country's private sector comprising both the manufacturing and service sector. In addition, the dataset identifies obvious factors that hamper firm performance such as access to finance, corruption, stifling business regulations, crime, inadequate workforce, political instability, informal competition, inadequate infrastructure, and lot more. This information helps to discern constraining factors that affect business survival. Finally, the harmonized dataset contains information on the operating state of all previously surveyed enterprises including enterprises that have exited the market. This information enables researchers to follow up over time changes in the business environment and as well, investigate the dynamics of firm survival/exit between two survey rounds (Aga and Francis 2015).

### Measurement of Variables

This study employs firm-level indicators as measure business constraints in Nigeria's business environment. The Nigeria enterprise survey measures firms' level of constraints in the business environment by asking "how much of an obstacle" a factor (say finance) is to firm current operation. Firms respond to such question with any of the following options: "no obstacle", "minor obstacle", "moderate obstacle", "major obstacle", and "very severe obstacle". This study uses confirmatory methodology – factor analysis to aggregate 15 of these indicators into a scale variable. The resulting scale variable has a Cronbach's alpha of  $\alpha = 0.7784$ , which indicates a good internal reliability. This scale variable (is hereafter referred as business constraint index) is a continuous variable for which a unit increase in the variable implies additional constraint in the business environment. The list of indicators that forms the business constraints index is contained in Table 1.

As stated earlier, information in the ES dataset is useful for investigating firms' survival/exit dynamics in the elapsed period between two survey rounds. This information is used to construct a binary indicator of firm exit that takes the value of one if a firm is considered to have exited the market, and zero if otherwise. In classifying "exited" firms, this paper follows Aga and Francis (2015) conservative definition of firm exit that is based on the idea that firms in business would remain in business until it is proven beyond every reasonable doubt that they have exited the market (Aga and Francis 2015). For the purpose of the analysis in this study and based on Aga and Francis (2015) classification of firm exit (weak exit), a firm is considered to have exited the market if (1) it is established during the screening process that the firm is out of operation; (2) firm activities now relate to an ineligible activity or status, such as moving abroad, becoming fully owned by the government, engaging in out-of-universe activities, or has withdrawn its membership with a trade association; or (3) all additional attempts to gather contact

information prove abortive after the listed contact information turns to be a dead line or a non-functioning phone line, and lastly, (4) contact information is misleading and there are no accessible new records (Aga and Francis 2015).

### Model Specifications for Exit Predication

This study adopts a binary outcome model for firm exit prediction (hereafter, the model is identified as exit model) following Hallward-Driemeier (2007) and Aga and Francis (2015) to examine the effect of business constraints on firms' risk of exit in Nigeria. The exit model is represented with the help of a binary choice equation below:

$$exit = \begin{cases} 1 & \text{if } Q_t < Q^* \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

Equation (1) represents firm's choice of exit, where  $Q_t$  and  $Q^*$  denote firm's current performance level and optimal performance level, respectively. The exit model is built on the assumption of perfect competition such that an enterprise operating in a business environment full of risks will choose or be compelled to quit the market if its' current level of productivity ( $Q_t$ ) falls behind certain optimal point ( $Q^*$ ) (Aga and Francis 2015). The model is conceptualized using method of latent variable in Eq. (2) and estimated by binary probit regression approach.

$$y_i^* = X_i\gamma + \mu_i \quad (2)$$

The latent or unobserved variable ( $y_i^*$ ) represents *ith* firm's risk of exit and is influenced by vector of observed explanatory variables ( $X_i$ ) which includes the business constraints index and host of firm-level factors;  $\gamma$  is the associated coefficients vector; and  $\mu_i$  is the error term. The error term in a probit model follows the assumptions of normal distribution, with zero mean [ $E(\mu) = 0$ ] and constant variance [ $\text{Var}(\mu) = 1$ ] (Long and Freese, 2001). Using a simple measurement equation (Eq. 3) further simplifies the relationship between the latent and observed binary outcome ( $y_i$ ).

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad (3)$$

Here, it is assumed that a firm choice or risk of exit is determined by a latent factor (say the propensity to remain in business) that cannot be directly measured. Firm exit is observed ( $y_i = 1$ ) when the latent factor is positive ( $y_i^* > 0$ ) and unobserved ( $y_i = 0$ ) if otherwise ( $y_i^* \leq 0$ ). The functional form of the latent variable model for binary outcomes can be expressed as:

$$\Pr(y = 1 | X) = \Pr(y^* > 0 | X) \quad (4)$$

The functional form of the exit model is expressed as:

$$\Pr(exit_{t+n}) = \Pr(y = 1) = BusCons_{it}, FirmCont_{it}, FE_{it} \quad (5)$$

Where  $\Pr(\text{exit}_{t+n})$  is the probability that *ith* firm will exit the market at  $\text{time } t + n$ . *BusCons* stands for business constraints; *FirmCont* represents firm-level controls included in the model; and FE corresponds to industry, location, and year dummies (fixed effects). As often pointed out in micro-econometric literature (e.g. Escribano et al. 2010), regressions on limited number of explanatory variables are likely going to produce biased results arising from omitted variables. A recommended approach in literature is to include control variables in the model.

The first set of controls in literature relates to firm demographics such as firm's age and size, usually referred as the "liability of newness" and "liability of smallness." Empirical evidences suggest that small and young firms have higher risk of exit than old and large firms. For example, Esteve-Pérez and Maníez-Castillejo (2008); Dunne and Masenyetse (2015); Aga and Francis (2015); and Esteve-Pérez and Sahiti (2019) found the effect of business size and age to robustly increase firm survival. A common explanation often put for in literature is that larger firms have production levels close to the minimum efficient scale (MES) and hence are less vulnerable than small firms that operate at a lower scale. Also, larger enterprises are known to be more diversified than smaller enterprises, thus their risk of withdrawal or termination because poor market conditions could be compensated by stronger market conditions elsewhere.

Firm ownership structure is another characteristic that can influence firm survival prospect. It relates to whether a firm has presence of foreign capital ownership and also whether females are part of the top owners of the firm. A common believe is that firms with international status are more likely to survive than their counterpart because they can benefit from local policies designed to encourage foreign investment, and as well have better access to advanced technology and financial resources. However, foreign ownership can also increase exit in scenarios where foreign-owned firms are less adaptive to the local environment; or cases where the local business environment does not encourage foreign participation. For example, Esteve-Pérez and Maníez-Castillejo (2008) observed absence of foreign capital participation to increase firm survival. In the same vein, empirical studies suggest that gender of firm owner matters for firm survival (e.g. Shiferaw 2009). The impact of firm performance on business survival remains inconclusive in literature. Studies like Salmon et al. (2018); Aga and Francis (2015); and Muzi et al (2021) provided evidence for the effect of performance on firm survival; Bosio et al. (2020), on the other hand, observed that firm survival times are not linked to higher productivity. This study also controls for other factors that are identified in literature such as export (e.g. Esteve-Pérez and Maníez-Castillejo 2008), investment in fixed assets and manager's year of experience (e.g. Orjiakor and Omeje 2022).

The other set of control variable relates to industry, location (region), and year dummy variables which control for unobservable factors that can influence firm exit. The industry dummies control for industry-specific factors like level of competition and innovation that explain firm exit. For example, firms in highly competitive industries face higher degree of exit risk compared to firms in less competitive sectors. Similarly, the location and year dummies control for the effect of firm location and time of survey, respectively. Table 2 describes the variables used in the analyses.

## IV. Results And Discussions.

### Summary Statistics

Table 3 shows the variables' summary statistics for sample of 1,157 panel firms used in the analysis. According the definition of firm exit in this study, 33 percent of the firms in the sample is considered to have exited the market by the second round of the survey. On average, a firm in the sample has existed for 16 years; consists of 15 permanent workers; and has past annual sales per work ratio of 751,157 naira (nominal value); while a manager in the sample has an average experience of 8 years in the industry. Little few of firms in the sample (less than 3 percent) made abroad sales in previous year and with the presence of foreign capital ownership (less than 2 percent). Majority of firms in the sample has at least a woman as part of the firm owners (85 percent) and over 96 percent belong to micro, small, and medium enterprises (MSMEs).

### Empirical Findings

Table 4 presents the probit estimates of firm exit. It begins by specifying a parsimonious regression model with the business constraints index and squared business index as the only explanatory variable (controlling only for industry and region fixed effects) in the first and third column respectively. The year dummy is omitted in the entire estimations due to high correlation with other explanatory variables. The remaining columns contain the full model with the nine firm-level control variables. Robust standard errors clustered by firms are used in all the model specifications to correct for the impacts of clustered data and for possible residual correlation across time for a given firm (Long and Freese, 2001). The estimated coefficients are interpreted with respect to their direction and statistical significance and not necessarily on the magnitude; with a positive (negative) value indicating that the variable increases (decreases) the risk of exit. In addition, the terms "significant" or "insignificant" estimate coefficient values apply to the traditional 10%, 5% and 1% level of significance.

Interestingly, the regression results establish that existing level of constraints in the business environment does not significantly explain firm exit in Nigeria as evident by an insignificant association between the business constraint index and the exit variable. On the other hand, the effect of the squared index further implies that additional constraints in the business environment will result to more firms exiting the market. This finding holds true throughout the specifications; that is, with and without controlling for heterogeneity across firms using firm demographics, the effect of squared business constraints on firm exit remains positive and significant.

Regarding the firm control variables, findings from the analysis support the premise in literature that firm risk of exit significantly decreases with firm size. However, there is no significant evidence that older firms have higher likelihood to survive; nor does managers' year of experience matter for firm survival. The finding on the effect of firm age can be attributed to simultaneity problem (the age variable being correlated with other firm characteristics) as pointed out by Aga and Francis (2015). The effect of export on firm exit is negative throughout the specifications but statistically significant only with the inclusion of

squared business constraints index measure. This implies that exporting firms are more resilient to severe business constraints. On the other hand, results from the analysis show that the presence of foreign capital ownership does not improve firm survival, nor does firm productivity matter for better survival prospect. These findings contradict popular opinion in literature and can be attributed to business dynamics in Nigeria's business environment.

The results also provide evidence for effect of ownership structure, relating to having at least one female as part of business owners. The effect is negative and statistically significant throughout the estimations. Thus, this finding contradicts the popular opinion that female owned businesses are more vulnerable than their counterpart. Similarly, there is significant evidence that firm with history of purchasing fixed assets using bank loan are less likely to exit market. This evidence also holds true in the entire model specifications. This implies that improving private sector access to financial credits for investment can help increase performance and hence improve likelihood of survival. In line with evidence in literature (e.g. Aga and Francis 2015), firms belonging to the category of micro, small, and medium enterprises (MSMEs) face greater risk of exit than their opponent (large firms). This can be attributed to MSMEs being more constrained in several areas such as finance, reliable electricity, and unfavourable tax policies.

## V. Concluding Remarks

This paper set out to investigate the impact of business constraints on firm exit in developing using Nigeria as a case study. Despite being the largest economy in Africa, Nigeria's business environment is faced with diverse challenges such as insecurity, infrastructural deficit, poor institutional quality (most especially corruption), unfavourable tax policy and excessive regulations from the government. According to the 2014 Enterprise Survey in Nigeria, inadequate finance, electricity, corruption, tax rates and poor transport network are the five biggest constraints to firms' operation in the country (Nigeria Enterprise Survey 2014). This study adopts a generalize view of business constraints by aggregating 15 firm-level indicators of business constraints into an index scale through a confirmatory methodology – factor analysis. Evidence from the analysis opines that current level of constraints in Nigeria's business environment is not associated with firm exit; however, additional level of constraints will result to more firms exiting the market.

Having established from this study that addressing business constraints can help secure firms' chances of surviving in business, therefore, it is imperative that policymakers should gear more efforts towards improving Nigeria's business environment through carefully designed policies that can foster private sector development.

## Declarations

- **Ethics approval and consent to participate:** Not applicable
- **Consent for publication:** Not applicable

- **Availability of data and materials:** Data used for this study is derived from a source in the public domain - World Bank Enterprise Survey and available for registered users at <https://login.enterprisesurveys.org/content/sites/financeandprivatesector/en/library/library-detail.html/content/dam>
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## Tables

Tables 1 to 4 are available in the Supplementary Files section.

## Figures

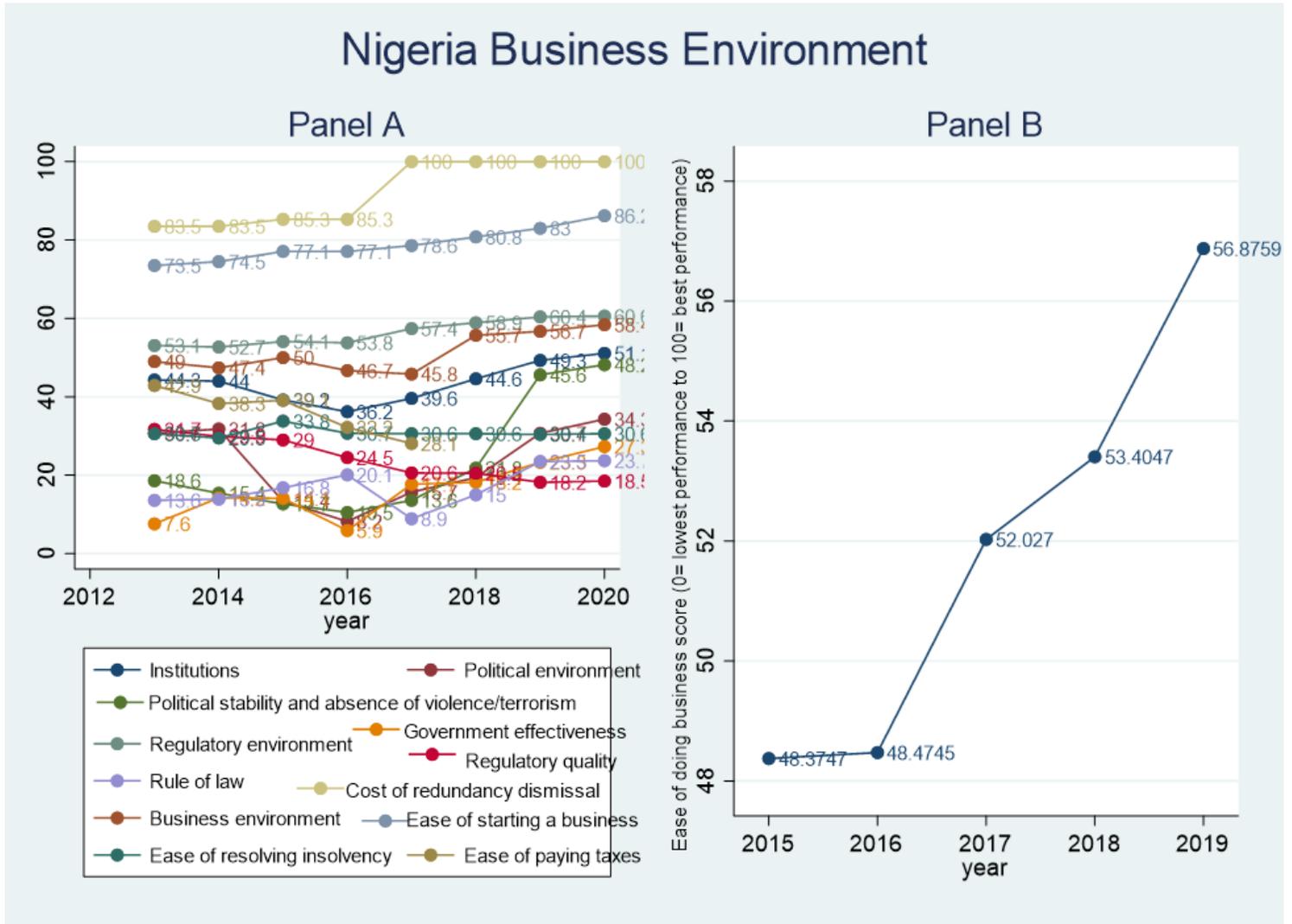


Figure 1

### Nigeria's Business Environment

Source: Author's Computation using Data from Global Innovation Index and World Development Indicators.

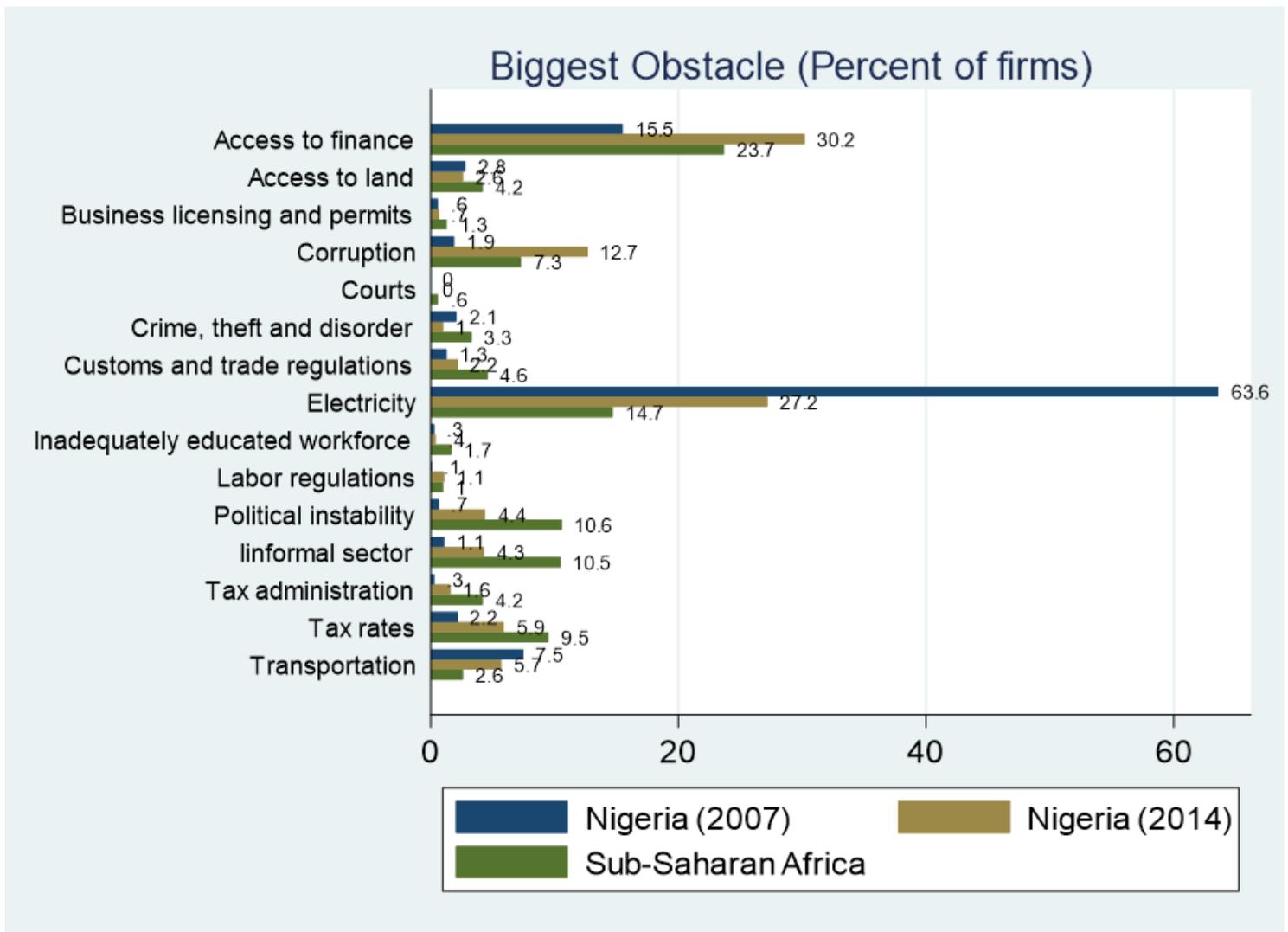


Figure 2

### Biggest Obstacles to Firms' Operation in Nigeria

Source: Author's Computation using Enterprise Survey Data

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Tables.docx](#)