Does trade openness influence the performance of small and medium enterprises in Nigeria? A re-evaluation of the evidence

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ARTICLE INFO

Keywords:
Small- and medium-scale enterprises
Trade openness
ARDL
Toda-yamamoto causality test
Nigeria

ABSTRACT

The theoretical premises of open trade predict that open economies would benefit more from trade than those in autarky. Empirical findings for Nigeria are mixed both for macro-based studies and those devoted to sectoral investigations. In this paper, we re-evaluate the evidence on trade openness’s impact on the performance of small- and medium-scale enterprises (SMEs) in Nigeria. Existing studies in this area suffer from a twin restriction; one in scope, the other in methodology. We thus employ a two-pronged analytical framework on time series data spanning 1981 to 2019. First, the autoregressive distributed lag (ARDL) methodology is used to investigate the short-run and long-run effects of trade openness on SMEs’ performance. Second, the Toda-Yamamoto causality test provides additional evidence on the direction of causality among the policy variables. Our findings show that trade openness exerts a positive but insignificant impact on the performance of SMEs. Causality test results indicate that variations in exchange rate, infrastructure, labour force and foreign direct investment influence the performance of SMEs. The paper recommends the creation of enabling environments that guarantee formidable enterprise performance amidst open trade. Specifically, there is need, among other things, for significant improvements in infrastructure levels as well as stability in the exchange rate.

1. Introduction

Small and medium enterprises (SMEs) are pivotal building blocks in the industrial and economic development of any nation. They significantly impact the economy via employment generation, raising national living standards and contributing to the gross domestic product and the utilization of local resources in the production of goods and services (Effiom & Edet, 2018, 2020). The Smedan and National Bureau of statistics, 2013 report describes SMEs as growth-enhancing sector that not only create and utilize local capital for productive purposes, but also improve the standards of living of the population. In developing economies, they are touted as increasing the levels of innovation and competition. In view of these, nations are becoming more sensitive to the needs of SMEs by creating a friendly business environment and instituting policies and programs that will enable SMEs to overcome the constraints and challenges they face.

Previous studies (for instance, Ubi and Mba, 2019; Okpara, 2011; Elizabeth and James, 2006; Zainawa, 2006) suggest that SMEs in Nigeria and in most emerging economies are faced with diverse and debilitating challenges. However, Okpara (2011) and Adebisi et al. (2015) have singled out capital deficit as the major challenge inhibiting SME growth in Nigeria. The credit deficit for SMEs remains a persistent problem given that the World Bank (2015) estimated the global credit gap for SMEs to be as high as US $2.6 trillion. It further concluded that while the gap varies across regions, it is worse in Africa. Consequently, to shore up domestic capital, developing nations are constantly being urged by developed donor nations to institute open economies to attract foreign capital in flow in the form of portfolio capital, foreign direct investments (FDI) and various forms of development assistance. However, the infant industry argument (in which small businesses in emerging economies are considered to be too small and weak to compete with foreign multinational organizations) opens a debate on the appropriateness of opening
up economies to the global economic space. Thus, our enquiry in this paper is narrowed to a single research question: Does trade openness influence the performance of small and medium enterprises in Nigeria?

Even though trade openness has been a phenomenon in operation for millennia, it was Smith (1776) and Ricardo (1817) who first developed and modernized the idea of free trade. Smith’s theory of absolute cost advantage as well as Ricardo’s comparative cost advantage theory posit that free and open trade is always the best arrangement for nations because it is more beneficial to trading countries than autarky. These theoretical arguments clearly underline the significance of trade openness to the growth of national economies.

There seems to be a high degree of correlation between the degree of unemployment, poverty, underdevelopment of a nation and the vibrancy of its SMEs. Efiong and Edet (2018) argue that the Nigerian economy has not fared better because SMEs have not played their expected role. Nevertheless, the performance of SMEs in Nigeria cannot be considered inconsequential because they have been able to encourage the use of local resources and, in some cases, have aided the conversion of local inputs into either intermediate or finished goods. Moreover, the survey on MSMEs carried out by SMEDAN in 2010 found that there were approximately 17.3 million MSMEs that employed almost 32.4 million persons and were responsible for approximately 46.54% of nominal GDP. In 2013, the number of MSMEs in Nigeria rose to approximately 37 million, providing work for approximately 59.7 million persons while accounting for 48.47% of nominal GDP and 7.27% of exports. The survey, however, notes that the proportion of SME exports is a far cry when compared to that of Malaysia, Thailand, China, and India, where SMEs are the engine of growth and the subsector is responsible for a major share of their exports (Smedan and National Bureau of statistics, 2013).

The macroeconomic indicators on Nigeria further show that even though the SME sector experienced negative growth in 2016 and 2017 due to Nigeria’s economic misfortune occasioned by the economic recession, the sector recorded the highest percentage contribution to GDP of 20% in 2016, as shown in Figure 1 below. The lowest performance of the SME sector relative to GDP was in 1982, with a percentage contribution of 8%. The average contribution of the SME sector to GDP in the 1980s, as indicated in Table 1, was 10.77%, increasing to 16.6% in the 1990s. In the 2000s, its percentage contribution fell slightly to 16.3% and peaked at 17.7% between 2011 and 2019.

Several reasons have been advanced to justify the relatively poor performance of Nigeria’s SMEs. These include inconsistency in government policies, lack of financial capital, limited market accessibility, and multiple taxation (Mambula, 2002; Efiong and Edet, 2018; Smedan and National Bureau of statistics, 2013). Other performance constraints include poor management, low market demand and poor infrastructure (Okpara, 2011), unfair competition (including dumping of fake/substandard goods from foreign trade partners, smuggling), marketing problems (e.g., low-patronage made in Nigeria goods by Nigerians), environmental factors such as harassment by officials of state agencies, insecurity caused by farmer/herder clashes, Boko Haram, human resource and technological constraints (Dimoji and Onwuneme, 2016), and oil spillage in the Niger Delta.

Thus, to extend the trajectory of knowledge, the present study takes a broader or macro perspective of the entire SME sector in Nigeria. We examine the effect of trade openness on the performance of SMEs in Nigeria by departing from previous studies from two fronts. First, studies carried out by Zainawa (2006) and Sajuyigbe, Alabi & Adewale (2016) were limited in scope to a small segment of the SME subsector operating within small communities in Nigeria, thus limiting the space and implications for policy. Second, the present effort contributes to the literature on the methodological front. By deploying the autoregressive distributed lag (ARDL) framework, the inhibitions of partial adjustment models of previous studies are eliminated. The ARDL methodology employed investigates and furnishes results for both the long- and short-run dynamic effects of openness on the performance of SMEs in Nigeria. Furthermore, the Toda-Yamamoto causality test deployed in examining the causal links among key policy variables is an improvement over previous studies. Expectedly, based on the distinct contributions of this investigation, policymakers in Nigeria have been provided with an informed template for the coordination and administration of SMEs operations in the country.

The rest of the paper proceeds as follows. Section 2 reviews the performance of SMEs in Nigeria and presents a survey of both empirical and theoretical literature. Section 3 presents the methodology, while Section 4 presents the analysis of the data and discussions of the results. The paper concludes in section 5.

2. Literature review

2.1. Performance of SMEs in Nigeria

While several definitions of SMEs have been documented in the literature, there is no universally accepted characterization, perhaps because of the often subjective classification of SMEs (Awe, 2002). Therefore, conceptualization varies depending on several factors, such as the country’s population size, business culture, industry, and the extent of international economic integration (Kushnir, 2010). For instance, in the European Union, an SME is a business venture that hires less than 250 persons, with an annual turnover not greater than EUR 50 million or total

Table 1. Average percentage contribution of SME to GDP in decades.

| Time/period | Average % contribution of SME to GDP |
|-------------|-------------------------------------|
| 1980s       | 10.8                                |
| 1990s       | 16.6                                |
| 2000s       | 16.3                                |
| 2010–2019   | 17.7                                |

Source: Authors’ computation using data from CBN statistical bulletin, various sources.

Figure 1. Shows the annual percentage contribution of the SME sector to GDP.
assets of EUR 43 million (European Small and Medium-sized Enterprises Center, 2019). However, in the United States, varying definitions and guiding principles that differ from one industry to another are adopted. For instance, a manufacturing company is categorized as a small business if it has employees not exceeding 500. Even at that time, a wholesale trading company can only have 100 employees to be counted as an SME (CFI, 2020).

We adopt the classification proposed by the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) as contained in The National Policy on MSMEs. In that regard, MSMEs are classified on twofold criteria: number of workers as well as assets, apart from land and buildings. Thus, a microenterprise is a business enterprise that employs fewer than 10 workers with total assets of less than 5 million naira. A small enterprise is that which has number of employees between 10 to 49 with asset of 5 to less than 50 million naira, while a medium scale business entity employs 50 to 199 staff with a total asset of between 50 to 500 million. This categorization therefore suggests that a significant part of SMEs in Nigeria are microenterprises and engage in traditional activities with low productivity levels.

2.2. Theoretical review

The Solow-Swan growth theory (Solow, 1956; Swan, 1956) explains how economic growth can be initiated and sustained through the appropriate combination and accumulation of capital (K), labour (L), and technology (A). The structure of the model, which mimics the Cobb–Douglas production function, is assumed to exhibit constant returns to scale as well as diminishing returns to the variable inputs, i.e., capital, and labour. By the first assumption, a doubling of either labour or capital, for instance, would proportionately double output, whereas by the second assumption, an increase in capital, for instance, holding labour constant, would result in an increase in output but by a lesser amount compared to the previous increase. Two outcomes or predictions emanate from this last assumption, namely, the principle of convergence, wherein growth rates of poor economies (such as those in developing countries) will eventually catch up with richer developed countries (Ebi and Nyong, 2020). Second and more importantly is the prediction that the law of diminishing returns will ultimately stifle any growth that relies solely on physical accumulation. In the neoclassical framework, policy measures such as investment subsidies and tax cuts affect only the steady state level of output but not the long-run rate of growth. Growth is affected only in the short run as the economy converges to the new steady state output level. Thus, as submitted by Sala-i-Martin (2002), of the three causes of growth – labour, capital and technological change – the only enduring source of growth must be the third, i.e., technological change.

The assumptions of the neoclassical model and their ensuing conclusions have been refuted by the endogenous growth theory, the severest of which has been the assumption that technological change (the Solow residual or total factor productivity) cannot be determined by factors within the model or economic system. The logical outcome of such a premise is the inevitability of secular stagnation and the cessation of growth, even in the presence of the best intentions of government policy. Thus, the basic question of why technological change occurs is left unanswered or unexplained. The challenge of explaining or resolving the source of technological progress, which in most cases accounts for over 50 percent of growth in industrialised economies (Todaro and Smith, 2005; Blanchard and Fischer, 1989), as well as clarifying the significant difference in residuals across nations with comparable technologies, was taken up by endogenous growth theorists, notably Romer (1986), Lucas (1988) and Barro (1990). By retaining the basic structure of the neoclassical model but altering the latter’s underlying assumptions (i.e., substituting increasing returns to the factor inputs for diminishing returns) and endogenizing technological change, endogenous growth theory comes to different conclusions compared to exogenous theory, namely, the possibility of continuous long-term growth.

Both theories are relevant to our present investigation, as they provide a clear pointer of how trade openness can positively impact the domestic economy via its SME sector on the one hand and how SMEs can in turn propel the rate of economic growth and development through capital accumulation and expansion of investments. In the Solow model, the assumption of technology globalization or transfer means that participating SMEs in international trade are guaranteed costless access to new techniques of production, which would make them more competitive at the global level. In the Romer model, the performance of SMEs can be affected through international spillovers or externalities arising from cross-border investment or trade. However, the sanguine predictions of these models have been the subject of much debate and scathing criticism by scholars. Essai (2012), for instance, argues that technology transfer is unrealistic given the growing tacitness of new technologies, which has made it increasingly easier for high-technology firms to hoard vital information on innovations, thus restricting the flow of new technology to firms in developing countries. With the hoarding of new technology, the prediction of convergence based on technology diffusion is submitted to be a fallacy.

Equally relevant in this paper is the classical theory of trade as formalized in the Smithian and Ricardian theories of free trade (Smith, 1776; Ricardo, 1817). According to Smith, the benefits of trade rest in the capacity of nations to produce for export commodities that it produces at absolutely lower real cost than its trading partner. When that happens, trade will benefit participating countries by widening their markets and increasing their productivity. Smith’s theory rests on the proposition that there are two commodities and two participating countries with absolute advantage in the production of one commodity each. It, however, fails to provide an adequate explanation of the basis of trade when one country has an absolute advantage in the production of the two commodities (Esang, 2001).

This dilemma is addressed by the Ricardian theory of comparative cost advantage. Here, the Smithsonian model is extended a step further by showing that two nations can gain from commodity exchange even when one of the trading partners has an absolute advantage in the manufacture of all the goods. For Ricardo, as far as the opportunity cost or comparative cost of producing any of the commodities differs between the two countries, trade will be beneficial to them. The core of the classical theory of free trade is, however, rooted in the labour theory of value, which measures the value of a commodity in terms of the labour time used in its production. Going by the tenets of the labour theory of value, since SMEs in developing countries specialize in the production of labour-intensive goods (and mostly raw materials) that command low prices in the international market, it therefore means that free trade, according to the classical theory, puts developing countries and their businesses in unfavourable terms of trade. Consequently, the general consensus is that the unqualified implementation of this theory will constrain the development efforts of developing countries (Ukwandu, 2015).

Another theoretical perspective relevant to this study is Structuralist theory (Prebisch, 1959; Singer, 1950), also known as dependency theory or the theory of unequal exchange (Emmanuel, 1976). Structuralism contends that trade between developed and developing countries is not always mutually beneficial, as put forward by classical theories. It argues that the underdevelopment of third world countries is a product of their dependence on advanced capitalist countries, and because of the dominance of developing countries by the metropolitan center, developing countries cannot experience independent development. Premised on seven main assumptions, the structuralist school comes to the conclusion that one of the disequilibrating forces is the terms of trade between the peripheral countries (the less developed countries, LDCs) and the centre (developed countries, DCs) and that it has shifted in favour of developed countries (Nyong, 2015). The theory further argues that the trade conditions of LDCs are worsened by the latter’s dependence on the DCs for technical know-how, machinery and capital equipment. The policy trajectory therefore is that developing countries should trade more with...
themselves because of their similar production techniques. In particular, the policy of import substitution industrialisation (ISI) is advocated as a panacea to address these imbalances in trade relations. Empirical support for the dependency school is echoed in the studies of Nkrumah (1966), Galtung (1971), Frank (1968), Dos Santos (1970) and Walenstein (1974). These lines of study are unanimous in reiterating that economic dependency has widened income inequality in LDCs and that the lower levels of inequality seen in DCs may in fact be a product of increasing the exploitation of developing economies.

These arguments, however, do not altogether render the position of the classical models invalid, especially in the context of SME growth. This is because the critical factor input, capital, is inadequate in developing countries. Therefore, excess capital from developed rich nations in the form of FDI, portfolio investments and even official development assistance (ODA) can augment the local capital deficit in the SME subsector in Nigeria. The structuralist school has been criticized in a number of studies. Spraos (1980), for instance, laments that the theory bears no correspondence to the realities of economic development. The poor economic and developmental outcomes arising from the implementation of the ISI have led several scholars to challenge and discredit the structuralist prescription (see, for instance, Machean, 1966; Grubel, 1977; Edwards, 1998).

2.3. Empirical review

The empirical findings on the association between trade openness and the performance level of SMEs have not been consistent. While some studies agree that trade openness is more beneficial to nations than protectionism (because it helps to expand the capital base for investments in the SME subsector), others have argued that trade openness allows the inflow of foreign and superior goods, which are more attractive and cheaper than the local goods, resulting in the high mortality rate of local SMEs. Aarti (2014), for instance, studied the effect of globalization on Indian small and medium enterprises using descriptive analysis and found that globalization not only had a negative effect on the growth of SMEs but also posed major threats and big challenges to MSMEs in India. Elizabeth and James (2006) studied the effect of globalization on the performance of white- and minority-owned small- and medium-sized enterprises in the United States. The study utilized a survey-based OLS estimation technique, and the results revealed a significant negative relationship between globalization and minority-owned small-scale businesses. A contrary outcome is, however, reported for Indonesian firms. Tambunam (2008) reviews the effect of Indonesian trade liberalization policy reforms on SMES, which account for over 90 percent of firms in the economy, and finds that there is an absence of evidence to suggest that liberalization policies have negatively influenced SMES in that country. Confirming this result and using a more rigorous analytical methodology (i.e., vector autoregressive model, VAR; and vector error correction model, VECM) for the same Indonesian economy with data covering 1971 to 2008, Rahmadi and Ichihashi (2011) find evidence to support the hypothesis that trade openness has a significant positive impact on SME growth.

Sun and Heshmati (2010), deploying econometric and nonparametric analysis on 6-year data of 31 provinces in China between 2002 and 2007, investigate the impact of trade openness on China’s SME performance. Their result shows that trade openness is a huge catalyst for the growth of SMEs in China. Similar studies for China come to the same conclusion (see Li et al., 2010; Can and Gozgor, 2015). In particular, Can and Gozgor investigate the impacts of export product diversification on aggregate export quality in a panel dataset of 115 countries within the period 1970–2010. The study observes, among other findings, that export quality increases proportionately with variation in export values among existing exports in low- and lower-middle-income countries. Utilizing the vector error correction model (VECM) on data covering 1987 to 2007, Mustafa (2011) investigated the relationship between trade liberalisation and the growth performance of SMEs in Turkey and finds that the short-run growth of SMEs is not significantly influenced by export growth. Similar conclusions are documented for Pakistan, namely, that employment and output for SMEs in Pakistan are boosted through the importation of raw materials for production (Javed, Qaiser, Mushtaq, Safi-ullah & Iqbal, 2012).

Nigerian studies on globalization or trade openness effects on SMEs document equally disparate findings. In a study on the impact of globalization on the development of SMEs in Enugu state in Nigeria, Chukwu et al., 2016, using percentages and the multiple regression method of data analysis, found a negative relationship between (stiff competition) and the development of SMEs in Nigeria. Furthermore, Zainawa (2006) studied the effect of globalization on Nigerian industries, focusing on Kano’s state footwear industry. A descriptive methodology was used to analyse the data spanning from 1980 to 2004, and the results revealed that globalization had a significant negative impact on the footwear industry, leading to plant capacity underutilization, unemployment, industrial stagnation and closures, as well as overdependence on imported leather footwear products from other developed economies. Another primary study that comes to the same negative conclusion about the effect of trade openness on SMEs in Nigeria is Obokoh, 2014. Utilizing structured questionnaires on 500 manufacturing small businesses in Lagos State of Nigeria, the study finds that liberalisation policies had a damaging impact on SMEs because of the absence of planning on the part of SMEs and unfavourable investment conditions in the economy. Oladimeji and Muhammed (2017) investigated the impact of international business on the growth of SMEs in Nigeria. Adopting the ordinary least square method, the results indicated that trade openness proxied by FDI and economic competitiveness had no significant influence on SMEs’ growth in Nigeria. A contrasting outcome was, however, reported in Sajuvigbje, Alabi & Adewale (2016), which found a positive nexus between globalization and small-scale business development in Nigeria.

The signing and coming into effect of the African Continental Free Trade Agreement (AfCFTA) by most member states of the African Union provides yet another opportunity for small businesses in Africa to exploit the advantages arising from trade openness. However, the potential benefits of the AfCFTA may be evaluated based on the impact or effectiveness of pre-AfCFTA trading regimes. A primary study by Rintaugu (2020) on the impact of regional integration on the performance of manufacturing SMEs in the East African Community (EAC) reveals that regional integration significantly affects the performance of manufacturing firms in Kenya who operate under the umbrella of the EAC. In particular, the surveyed SMEs, numbering 451, were particularly impacted by the accessibility to finance, business infrastructure, competition and finance afforded by the EAC.

Another area in which greater regional and global integration would affect SMEs is that of international value chains (IVCs). This is a budding phenomenon where the stages and processes of production occur in different countries. While the low intra-African trade of a paltry two percent between 2015 and 2017 (Afreximbank, 2018), it is unlikely that African or particularly Nigerian SMEs would benefit from the external economies provided by IVCs. Data show that with abysmally low trade within the African continent, most of the domestic value added is exported outside Africa. However, this is not the case for countries in Europe, Asia and North America, where the value chain is more regional because of intense trade within member countries (International Trade Centre, 2017). It is apparent that with many constraints compromising the performance of SMEs in Nigeria and many other developing countries, these small businesses may not be able to exploit the advantages conferred by greater integration, especially those posed by increased competition from low-cost producers within the AfCFTA framework (Kituyi, 2018).

Our review of empirical literature shows that while most of these Nigerian studies were minor in nature, with restricted policy implications, others employed methodologies that were not robust to alternative model specification or variable substitution. In some of the macro studies
on SMEs reviewed above, there was a clear deficiency with respect to measurement issues. For instance, studies such as Oladimeji and Muhammed (2017) did not indicate how SME growth or performance was measured. The present effort seeks to fill these gaps.

3. Research methods and data

3.1. Model specification

The Solow-Swan neoclassical growth model underpins our model specification. We begin with the Cobb–Douglas production function of the form,

\[ Y = f(AK^\alpha L^{1-\alpha}) \]  

where \( Y \) is economy-wide output, \( K \) is capital and \( L \) is labour. \( A \) represents technological progress or total factor productivity. The Cobb–Douglas production function is flexible and permits the amplification of \( A \) by incorporating other factors that directly affect the growth of SMEs. Thus, we incorporate openness (OPEN), herein measured as the ratio of imports and exports to the GDP, net foreign direct investments (FDI), and exchange rate (EXR), in SMEs.

Thus, \( A \) in Eq. (1) becomes

\[ A = f(OPEN, FDI, EXR) \]  

Putting Eq. (2) into (1), we have the functional form of the model expressed as:

\[ Y = f(OPEN, FDI, EXR, K, L) \]  

The economy-wide aggregate output \( Y \) is replaced with the output of a subsector. This is in line with similar studies that augment the neoclassical growth model to investigate the output growth of a specific sector (Adedeji and Dauda, 2004; Ada and Anyanwu, 2014; Lucas, 1988; Ogbugu and Udo, 2012).

Thus, the linear econometric form of Eq. (3) becomes:

\[ SME_p = \delta_0 + \delta_1 OPEN + \delta_2 \ln FDI + \delta_3 \ln EXR + \delta_4 K + \delta_5 \text{LAB} + U \]  

Thus, \( SME_p \) denotes the performance of SMEs, while \( \delta_1 \ldots \delta_5 \) are the coefficients of the explanatory variables. On a priori, we expect \( \delta_1, \delta_2, \delta_3 \) and \( \delta_5 \) to be positively correlated with the dependent variable, SME\(_p\), while \( \delta_4 \) is expected to be negative. \( U \) is the stochastic error term, representing the unexplained residual or variation in the dependent variable.

3.2. Data descriptions

Based on the objectives of this study, annual time-series datasets spanning 1981–2019, sourced from the Central Bank of Nigeria statistical Bulletin, 2019 were evaluated for empirical illustration. Meanwhile, the time frame is determined by data availability constraints. In particular SMEs performance is measured by output of wholesale and retail trade (Ubi and Mba, 2019; Effiom and Edet, 2020); exchange rate represents the official rate at which the Nigerian naira exchanges for the United States dollar and is computed as a yearly average, based on monthly averages; FDI is measured as Net Foreign Direct Investment – difference between inflow and outflow of FDI in Nigeria; trade openness or liberalisation is measured as the ratio of the sum of imports and exports to the GDP; capital is proxied by stock of gross fixed capital formation as a percentage of GDP, while labour is measured as labour force employed in the SMEs sector.

3.3. Estimation techniques

The chosen analytical framework for the study is the ARDL technique. As noted by Shrestha and Bhatta (2018), several properties of macroeconomic time series mandate the use of the ARDL structure.

First, macroeconomic data are inherently autoregressive, meaning that current values bear some relationship with their own prior values; second, they are intrinsically nonstationary, having tendencies of not returning to their long-run average values. Specifically, this means that their covariance, variance, and mean exhibit changes over time. Finally, they exhibit trend, seasonality and cycle through time. The existence of these properties in macroeconomic data demands a careful choice of methodology. In the instant case, the ARDL is chosen based on the following documented merits. First, it is superior to earlier traditional methods in that it can be deployed on data that are stationary at levels [I(0)], stationary upon first differencing [I(1)] or a mix of I(0) and I(1). Second, the ARDL exhibits results that combine both the long-run and the short-run effects of the estimated variable; third, the applicable diagnostic test of an ARDL model is more reliable; and last, while most cointegration techniques are sensitive to the sample sizes, the ARDL structure fulfils consistent and robust results even for small sample sizes (Effiom and Edet, 2020; Pesaran et al., 2001; Uche and Effiom, 2021). The execution of the ARDL model proceeds first by investigating the stationarity properties of the data used in the study. This was done using both the augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests. It must be noted that the methodology becomes inapplicable if the underlying data are stationary at second difference, I(2). We next investigate the cointegrating relationship of the variables using the bounds tests advocated by Pesaran et al. (2001). The null hypothesis of no cointegration in the bounds test is evaluated using both the Wald and F-statistics. These tests are compared with the critical values of the lower and upper bounds. A higher estimated value of the F-statistic or Wald statistic means a rejection of the null hypothesis; if the estimated value is lower, the null hypothesis is accepted (Uche et al., 2021; Omode and Uche, 2021). However, an indecisive conclusion is affirmed if the calculated value lies between the two critical values. Finally, we conduct various postestimation tests of serial correlation, stability and linearity using the Breusch-Godfrey Serial Correlation LM test, Ramsey Reset test, and the Q-statistics test.

The corresponding ARDL structure of the theoretical model in Eq. (4) is represented in Eq. (5) to be estimated as follows:

\[ \Delta SME_p = \gamma_0 + \gamma_1 SME_{p-1} + \gamma_2 \ln EXR_{t-1} + \gamma_3 OPEN_{t-1} + \gamma_4 \ln FDI_{t-1} + \gamma_5 \ln K_{t-1} + \gamma_6 \ln LAB_{t-1} + \gamma_7 \delta_1 \Delta SME_{p-1} + \gamma_8 \delta_2 \Delta EXR_{t-1} + \gamma_9 \delta_3 \Delta OPEN_{t-1} + \gamma_10 \delta_4 \Delta FDI_{t-1} + \gamma_11 \delta_5 \Delta K_{t-1} + \gamma_12 \delta_6 \Delta LAB_{t-1} \]

(5)

Equation (5) is decomposed into short-run and long-run components, with \( \delta_1 \) to \( \delta_6 \) being the long-run multipliers; \( \gamma_1 \) to \( \gamma_6 \) are the short-run coefficients to be estimated, while \( \gamma \) is the intercept and \( \mu \) is the error term.

4. Data analysis and discussions

The underlying properties of the empirical data as well as a preliminary assessment of the relationships among the variables are summarized in Table 2. The mean value of the naira exchange rate to the dollar is N88.83, with minimum and maximum rates of N20.64 and N305.79, respectively. This is indicative of the relative strength of the local currency, especially during the prestructural adjustment era when the naira was almost at par with the US dollar compared to the current regime of market liberalisation. The deviation of the exchange rate from its mean value is marginal. Foreign direct investment ranges from $0.13 million to $1.92 million, with a mean value of $0.36 million, while on average, the output growth of SMEs within the study period was 23.10% of GDP, with minimum and maximum values of 0.24% and 73.67%, respectively. A general evaluation of the deviations of the variables from their mean values indicates insignificant variation.
In particular, it is noted that with respect to key policy variables of the study (i.e., SMEp and OPEN), the performance of SMEs reached its peak at a value of N73.67 billion and a minimum value of N0.24 billion within the study period—an abysmal performance when juxtaposed with the contribution of the sector to GDP. This is not surprising at all, as documented evidence shows that SMEs in Nigeria are bedeviled by so many constraints (Effiom & Edet, 2018, 2020). The period of this peak performance was between 1983 and 1984, a few years before the introduction of the structural adjustment programme (SAP), a neoliberal policy of market fundamentalism. The SAP policy of exchange rate devaluation crippled the Nigerian economy, especially small local businesses (Ndebbio, 2006; Ekpo, 1992). Since then, the SME sector has not recovered despite several government interventions. It is therefore of no coincidence that within the SAP period of deregulation and trade liberalisation, the maximum value of trade openness reached 58.9 percent; the minimum value was 7.40 percent, coinciding with the pre-SAP era.

There exist moderate to weak correlations of the variables to each other. For instance, SMEp is shown to have a negative but weak correlation with the exchange rate; however, it is positively correlated with FDI, capital, and openness. These results are thus far in tandem with a priori expectations and provide a cursory hint to the ensuing analytical results.

### 4.2. Unit root test

The stationarity properties of the data series were investigated via three-pronged tests: The Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Ng-Perron techniques, with the last two playing a confirmatory role. The test results displayed in Table 3 show consistency in both the ADF and the PP. While FDI and SMEp were stationary at their levels I(0), EXR, K, and OPN were stationary at first difference I(1) for both tests. The four Ng-Perron test statistics were all smaller in absolute terms than the critical values at both the one and five percent significance level, necessitating the rejection of the null hypothesis of non-stationarity. The variables were stationary either at I(0) or I(1). A combination of both I(0) and I(1) technically mandates the deployment of the ARDL regression methodology. Next, a cointegration test is conducted.

### Table 2. Statistical properties.

| Variable | Obs. | Mean | Std. dev. | Min | Max. |
|----------|------|------|-----------|-----|------|
| EXR      | 38   | 88.83| 87.02     | 0.64| 305.79|
| FDI      | 38   | 0.36 | 0.45      | 0.13| 1.92 |
| K        | 38   | 87234| 44313     | 77628| 96786|
| LAB      | 38   | 90056| 65438     | 21876| 98518|
| OPEN     | 38   | 30.09| 12.68     | 4.70 | 73.87|
| SMEp     | 38   | 23.10| 20.76     | 0.24| 73.67|

### Table 3. Unit root and cointegration tests results.

#### ADF-Statistic

| Variable | EXR | FDI | K | LAB | OPEN | SMEp |
|----------|-----|-----|---|-----|------|------|
| Test Critical Values at 5% Level | -2.948 | -2.948 | -3.537 | -2.948 | -2.948 | -2.948 |
| Level | -2.411 | -3.350 | -1.949 | -5.702* | -2.329 | -3.697 |
| 1st Diff | -5.904 | -6.715* | -7.924 | - |
| Remark | I(1) | I(0) | I(1) | I(0) | I(1) | I(0) |

#### Phillips-Perron Statistic

| Critical Values at 5% | -3.537 | -3.537 | -3.537 | -3.537 | -3.537 | -3.537 |
| Level | -1.193 | -3.99** | -1.919 | -5.911* | -1.951 | -3.748** |
| 1st Diff | -4.480* | -6.87* | -9.58** |
| Remark | I(1) | I(0) | I(1) | I(0) | I(1) | I(0) |

#### NG-Perron Statistic

| Deterministic component: Constant and Trend | Lag | M2g | M2s | MSB | MPt | Remark |
|-------------------------------------------|-----|-----|-----|-----|-----|--------|
| Variables | 3 | -6.253 | -5.342 | 0.677 | 4.099 | I(0) |
| EXR | 3 | -4.156 | -4.265 | 0.873 | 3.541 | I(0) |
| FDI | 3 | -1.754 | -8.112 | 0.925 | 3.012 | I(1) |
| K | 3 | -2.982 | -2.124 | 0.734 | 2.564 | I(0) |
| LAB | 3 | -1.431 | -4.101 | 0.467 | 3.430 | I(1) |
| OPEN | 3 | -1.552 | -5.321 | 0.619 | 2.876 | I(1) |
| SMEp | 3 | -1.023 | -2.912 | 0.854 | 2.123 | I(0) |
| Critical values | 1% | -23.80 | -25.233 | 2.847 | 7.236 | - |
| 5% | -17.34 | -23.124 | 1.792 | 6.458 | - |

#### Bounds Test Results

| Test Statistic | Value | Significance | I(0) | I(1) |
|----------------|-------|--------------|------|------|
| F-statistic | 3.925 | 10% | 2.2 | 3.09 |
| K | 5 | 5% | 2.5 | 3.49 |
| 2.5 | 2.88 | 3.87 |
| 1% | 3.29 | 4.37 |

Decision: Existence of long run cointegrating relationship.

Source: Authors’ Data Analysis. * and ** denote 1% and 5% significance levels, respectively.

### 4.1. Descriptive statistics

In particular, it is noted that with respect to key policy variables of the study (i.e., SMEp, and OPEN), the performance of SMEs reached its peak at a value of N73.67 billion and a minimum value of N0.24 billion within the study period—an abysmal performance when juxtaposed with the contribution of the sector to GDP. This is not surprising at all, as documented evidence shows that SMEs in Nigeria are bedeviled by so many constraints (Effiom & Edet, 2018, 2020). The period of this peak performance was between 1983 and 1984, a few years before the introduction of the structural adjustment programme (SAP), a neoliberal policy of market fundamentalism. The SAP policy of exchange rate devaluation crippled the Nigerian economy, especially small local businesses (Ndebbio, 2006; Ekpo, 1992). Since then, the SME sector has not recovered despite several government interventions. It is therefore of no coincidence that within the SAP period of deregulation and trade liberalisation, the maximum value of trade openness reached 58.9 percent; the minimum value was 7.40 percent, coinciding with the pre-SAP era. There exist moderate to weak correlations of the variables to each other. For instance, SMEp is shown to have a negative but weak correlation with the exchange rate; however, it is positively correlated with FDI, capital, and openness. These results are thus far in tandem with a priori expectations and provide a cursory hint to the ensuing analytical results.

The stationarity properties of the data series were investigated via three-pronged tests: The Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Ng-Perron techniques, with the last two playing a confirmatory role. The test results displayed in Table 3 show consistency in both the ADF and the PP. While FDI and SMEp were stationary at their levels I(0), EXR, K, and OPN were stationary at first difference I(1) for both tests. The four Ng-Perron test statistics were all smaller in absolute terms than the critical values at both the one and five percent significance level, necessitating the rejection of the null hypothesis of non-stationarity. The variables were stationary either at I(0) or I(1). A combination of both I(0) and I(1) technically mandates the deployment of the ARDL regression methodology. Next, a cointegration test is conducted.
using the bounds testing procedure to determine the existence or absence of a long-run relationship among the variables.

The results also reveal that the model variables, although nonstationary in the short run, have an underlying long-run cointegrating relationship that merits their use in the ARDL analysis. This is because the estimated F-statistic (3.925) exceeds the critical values of both the lower and upper bounds at all significance levels, except at the upper bound of the one percent level, where 3.925445 < 4.37.

Table 4, which presents the long-run and short-run ARDL results, indicates that while the growth of SMEs is a decreasing function of exchange rate (i.e., SMEp declines as EXR increases), it is positively impacted by all other explanatory variables. In particular, a 10% increase in OPEN, FDI, K and LAB (all things being equal, and on average) leads, respectively, to a 1.66%, 4.09%, 6.75%, and 0.72% increase in the growth of SMEs within the study period. All estimated parameter coefficients conform to a priori expectations. However, their significance levels show that some are not major factors explaining variations in the dependent variable. For instance, OPEN and FDI are not significant predictors of SME growth in Nigeria. Possible reasons for this insignificance could be the high costs of trade openness, as noted above, might be due to the hostile domestic environment that SMEs are constrained to operate in. In the absence or parlous state of basic infrastructure such as electricity, transportation and communication infrastructure, high taxation, lack of access to venture capital and other funding options, etc., SMEs cannot reap the benefits of trade openness, nor do they have buffers to cushion the negative effects of liberalisation; they also suffer from high mortality rates. These are mostly domestic constraints that preceded liberalisation policy, which have perhaps worsened the conditions of SMEs, as the economy is stuck in the warm embrace of trade openness. It is also instructive to observe that gross fixed capital formation (K), which is synonymous with domestic investment and infrastructure, exerts a comparatively greater impact on SMEs than FDI.

The result of the short-run error correction ARDL model, with an automatically selected maximum lag at (3, 0, 3, 1, 0) using the Akaike information criterion (AIC), indicates that the output growth of SMEs in the current period is reinforced by its previous lagged values. In other words, SMEs’ current growth levels are positively associated with their immediate past values. Both are also highly statistically significant. Consistent with the long-run results, the estimated coefficient of the exchange rate reveals that a 10% increase in the exchange rate (depreciation of the local currency) induces a 2.24% decrease in the performance of SMEs in Nigeria. The results also show that in the short run, openness positively impacts SME growth, although it is not significant. This is in tandem with the long-run results reported earlier. Foreign direct investment, capital and labour are also positively and significantly associated with the performance of SMEs. A key feature of the selected model is that the error correction term exhibits all the relevant criteria for acceptability: it is negative, fractional, and statistically significant at the one percent level. This and the outcomes of other postmortem evaluation tests, including the Breusch-Godfrey Serial Correlation LM test, for serial correlation, the Ramsey RESET test for misspecification, the Breusch-Pagan-Godfrey test for heteroscedasticity and the Jarque-Bera normality test, confirmed the robustness of the empirical estimates.

This further imply that the specified empirical model is free from the inhibiting assumptions of the classical linear regression model, CLRM. Specifically, nonlinearity, serial correlation, heteroscedasticity of residual variance, and deviation from normal distributions of the residuals in the model are absent. This is because the probabilities connected to the test statistics exceed 0.1 (i.e., are insignificant), implying that relevant policy recommendations can be advanced from the results. The stability of the model is additionally confirmed by the CUSUM and CUSUM of squares plots presented in Figures 2 and 3, respectively. Both show that the plots of the empirical model are within the 5% critical bound. This endorses the absence of any structural instability in the estimated parameters within the study period, and therefore, the results are suitable for policy-making decisions.
for long-term policy prescriptions. However, policymakers are advised to take into account the eventual interference of momentary shocks given the notable instability within some portions of the CUSUM of square graphs.

Having evaluated the short-run and long-run relationships in the model, we next investigate the direction of causality among the variables of the study. This is necessary because of the hybrid stationarity properties of the data. Table 5 exhibits the Toda-Yamamoto causality test results. Commenting briefly on the variables of interest, we note (vide Table 5) the existence of a unidirectional causality running from trade openness, labour force in SMEs, capital, FDI and exchange rate to growth.

As noted earlier, one of the merits of the ARDL analytical framework is that it furnishes robust estimates of both the short- and long-term results. From the results presented above, two important findings are important. First, it was established that the performance of SMEs is positively driven by trade openness. The caveat, however, is that this positive impact is insignificant. This implies that although SMEs benefitted from the external economies provided by trade liberalisation (as earlier endorsed by Murat and Isaac, 2019), the proportion of their performance associated with liberalisation is quite low or inconsiderable. Our finding is corroborated by Oladimeji and Muhammed (2017), who document that trade openness insignificantly impacts the growth of SMEs in Nigeria. This outcome may not be totally surprising given that the literature finds that countries who benefit more from trade liberalisation are those whose domestic economic conditions are robust enough to attract and adapt the dynamic benefits arising from trade and economic relations with other countries. The case of developing countries, particularly Nigeria, is worrisome, given the poor state of infrastructure, rising insecurity, and policy somersault (Effiom and Edet, 2020; Effiom and Edet, 2019). In fact, Gamage et al. (2019) specifically link the high mortality rate of SMEs in developing countries to the negative impact of trade openness, largely due to a poor domestic operating environment. Similar conclusions are shared by Auwal et al. (2018) and Ahmedova (2015), who submit that a key challenge to the growth of SMEs is global competition induced by trade openness. This explains why the proportion of Nigeria’s non-oil exports is quite low compared to the quantity of goods imported into the country. Eniola and Entebang (2015) similarly argue that SMEs that produce localized products are most affected by trade openness because of the penetration of local markets by well-established foreign firms. In terms of the direction of the relationship between trade openness and SMEs, our findings contrast with Chikwu et al. (2016) and Zainawa (2006).

"The Toda-Yamamoto causality tests, which constitute the second flank of our findings, revealed a unidirectional causality running from exchange rate, FDI, labour force, infrastructure, and trade openness to the performance of SMEs. This implies that these variables cause significant variations in the performance of small businesses. This result has implications for future policy directions in the SME subsector. It should be noted, however, that most developing countries that were in the warm
embrace of trade openness, even against the compelling infant industry argument, did so, not out of a firm conviction of the positive effects of the policy but out of the general conditions attached to accessing capital from multilateral financial institutions, such as the World Bank or the International Monetary Fund, IMF.

5. Conclusion and policy implications

The theoretical and empirical literature documents contrasting evidence on the effect of trade openness on the performance of small and medium enterprises. In this paper, we re-evaluate the evidence, especially as extant empirical studies on the subject in Nigeria are either limited in scope or restricted in methodology. Applying the ARDL methodology to time series data from 1981 to 2019, we find evidence of a positive but insignificant impact of trade openness on SME performance in Nigeria. Additional evidence is also furnished via the Toda-Yamamoto causality test, namely, that variations in exchange rate, foreign direct investment, infrastructure, and labour force influence the performance of SMEs. The insignificant impact of trade openness, as noted above, might be due to the hostile domestic environment that SMEs are constrained to operate. In the absence or parlous state of basic infrastructure such as electricity, transportation and communication infrastructure, multiple taxation, lack of access to venture capital and other funding options, etc., SMEs cannot reap the benefits of trade openness, nor do they have buffers to cushion the negative effects of liberalisation; they also suffer from high mortality rates. These are mostly domestic constraints that preceded liberalisation policy, which have perhaps worsened the conditions of SMEs, as the economy is stuck in the warm embrace of trade openness. Recognizing that the Nigerian economy has toed the path of trade liberalisation since 1986 when the government adopted the SAP, our policy recommendation is therefore not a reversion to the era of protectionism. Rather, policy must focus on providing a domestic enabling environment for SMEs to exploit the advantages conferred by trade openness. Specifically, the challenge of inadequate infrastructure (roads, telecommunication, rail transportation, electricity, portable water, etc.) must be adequately addressed by the government at all levels.

The outcome of the Toda-Yamamoto causality test strengthens the above-recommended policy stance, given that the evidence shows that the performance of SMEs is directly caused by domestic infrastructure, labour force, and FDI. This implies that balanced management of these variables could guarantee the optimal performance of SMEs in Nigeria. In what follows, future research in this area might consider using different measures for trade openness and SME performance. For instance, it would be interesting to see the potential insights if productivity is used instead of performance. However, this would mean over-come the present data constraints typical of studies on SMEs in Nigeria.

Declarations

Author contribution statement

Lionel Effiom: conceived and designed the experiments, and also wrote the paper.
Noel Ebebuing: performed the experiments.
Emmanuel Uche: analyzed and interpreted the data.
Okey O. Ovat: contributed, materials, analysis tools or data.
Rowland Tochukwu Obiakor: analyzed and interpreted the data.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data included in article-supplementary material/referenced in article.

Declaration of interest’s statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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