



Doctoral School of Economics and Regional Sciences

**Bank-Imposed Conditions, the Business  
Environment, and Performance of Kenyan Firms**

**The Thesis of the Ph.D. Dissertation**

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## INTRODUCTION

*“Once an organization loses its spirit of pioneering and rests on its early work, its progress stops”*- Thomas J. Watson (1874-1956)

### 1.1 Study Background

The existing empirical literature suggests that access to formal credit has a strong influence on the firm. Credit-constrained firms register an inferior financial performance than those with considerable credit facilities access (Fowowe, 2017). Credit availability influences crucial firm facets like expansion, research, development (R&D), or innovation (Agénor & Canuto, 2017). For instance, finance availability was a significant factor in firm survival during the 2007 Global Financial Crisis (McGuinness, Hogan, & Powell, 2018). Likewise, with the Covid-19 pandemic, businesses across the globe may face a similar GFC scenario. Whereas firms may use internally generated funds, often, they are forced to source the deficit externally.

Fundamental to any modern economy is a well-functioning financial system with banks playing a central role. The banking industry has been the traditional provider of credit to private businesses. Studies establish a statistically significant correlation between access to bank finance and firm performance (Lee, 2019). Specific industry factors like bank market power (Cubillas & Suárez, 2018) and competition (X. Wang, Han, & Huang, 2020a) may influence firms' credit flow. Also, a country's monetary policy determines credit availability—for instance, an expansionary policy results in increased outflow and vice-versa. Research establishes a meaningful association between monetary policy, bank market power, and bank competition.

Further, banks may impose specific conditions or standards on a firm before advancing credit. These requirements vary across firms based on industry, age, ownership, operations, among others. Thus, access to credit lines for private firms is more contingent on bank-imposed standards than for public firms. Firms are unlikely to gain access to new lines when credit market conditions tighten. Still, credit crunches have a disproportionate effect on private firms. Businesses with no credit lines use more trade credit whenever banks tighten lending conditions. Nonetheless, pre-existing banking relationships may mitigate credit contractions to private firms (Demiroglu, James, & Kizilaslan, 2012).

Likewise, Köhler Ulbrich, Hempell, and Scopel (2016) demonstrate that banks revise lending standards based on their vulnerability to macroeconomic shifts in the domestic and global environment. As a result, even banks operating in the same economic block may institute

different standards depending on their vulnerability. For example, those in country A may tighten the rules while those in B may do the opposite. Firms, especially the small and medium, should pursue relationship building and trust banking. Research suggests that these approaches minimize information asymmetry leading to higher credit flow (Kautonen, Fredriksson, Minniti, & Moro, 2020; Moro & Fink, 2013).

Even so, technological breakthroughs are revolutionizing firm fundraising, and SMEs are no exception. Technologies such as Initial Coin Offering (ICO) and blockchains such as cryptocurrencies or crypto-assets are game-changers (Boreiko, Ferrarini, and Giudici, 2019). The merging of technology and financial services (FinTech) is a paradigm shift in the traditional bank financing options. These technologies are enabling high-value firms to pool funds from all corners of the globe. They offer firms with profitable investment opportunities a lifeline that would otherwise be cut short by bank loan rejections (Haamledari & Fischer, 2020).

Moreover, the task (industry-specific) and the remote environment (external to the firm) are the firms' two business environment types. Whereas the remote environment is beyond a firm's control, the task environment determines how well an industry performs relative to another. Research shows that different business environment elements have varying impacts on firms. Factors deemed insignificant in one country may substantially affect firms in another economy (Commander & Svejnar, 2011). Gogokhia and Berulava (2020) established that the business environment strongly relates to R&D investments, innovation, and labor productivity.

That notwithstanding, the literature establishes a substantial nexus between innovation and firm performance (Gök & Peker, 2017; Saunila, 2017). A firm must employ a dynamic business model reflective of the ever-shifting business environment. A case in point is the Borders Company and Amazon's business model innovation in the bookselling industry. Borders collapsed just because top management never shifted from the traditional superstore identity despite changes in the business environment. The unfortunate outcome demonstrates why, in some instances, firm unlearning may be inadequate, leading to organizational demise instead of a renewal. Other examples include Kodak film and Nokia (which has since reinvented its business model).

Finally, firm age and ownership are essential firm characteristics. As the firm ages or goes through different business life phases, so are its preferred financing options and investment opportunities (Adelino, Ma, & Robinson, 2017; Kieschnick & Moussawi, 2018). Besides, these two characteristics influence firm involvement in innovation activities (Fan & Wang, 2019a).

While researchers concur that firm age is a significant determinant of performance (Coad, Daunfeldt, & Halvarsson, 2018), they seem to differ between the young and old firms' superior performance. Likewise, the link between ownership type and firm performance remains a gray area. Some scholars opine that ownership structure influences performance (Maria and Bogumil, 2017), but others establish no meaningful relationship.

## **1.2 Statement of the Problem**

Extensive research suggests that small and medium enterprises (SMEs) account for a higher percentage of all businesses in emerging and mature economies. Researchers have explored SMEs' contribution to the national economic basket, such as through productivity and employment. A few selected examples across different economies include the European market (González-Loureiro & Pita-Castelo, 2012), Asian (Aris, 2007), American (Kruja, 2013), Latin American (Cravo, Gourlay, & Becker, 2012), and African (Taiwo, Falohun, & Agwu, 2016).

Likewise, substantial literature explores Kenyan SMEs and their role in the country's economic development. Kenya's institutions of higher learning continually produce a skilled workforce against few job opportunities. The government continues to face a situation of high labor supply against a dwindling job supply. For example, the country had an unemployment rate of approximately five percent before the Covid pandemic; however, the rate has since doubled based on the Kenya National Bureau of Statistics (KNBS) report (2020). Further, the KNBS report (2016), a national survey of Micro, Small, and Medium Enterprises (MSMEs) meant to assist county, and national governments in planning had insightful findings. The report finds that MSMEs contribute over a third of the country's gross national product.

Still, the KASNEB-CMA report (2020) finds that MSMEs account for 80% of the country's employment opportunities and 40% of the GDP. Cognizant of the role SMEs play in economic development, the government is fronting self-employment or job creation. The strategy is to address the growing levels of unemployment, mainly among the youth. Unfortunately, the biggest hurdle to would-be or existing entrepreneurs is access to financial resources. The government, through state corporations, avails funds to spur entrepreneurial activities. The funding bodies include the Youth Fund, Uwezo Fund, and Women Enterprise Fund, explicitly targeting youth, women, and persons with disabilities.

Also, other government-linked bodies offer credit to private companies but under stringent requirements. These include the Industrial and Commercial Development Corporation (ICDC),

Kenya Industrial Estates (KIE), Industrial Development Bank (IBD), and Agricultural Finance Corporation (AFC). These four deal exclusively with medium and large enterprises, unlike the previous three. Ultimately, the demand for credit outweighs the (government) supply. Thus, the majority of the firms have to secure financing elsewhere. Regrettably, domestic firms have not harnessed technology's power to explore new ways of raising capital. The scenario is contrary to firms in developed markets that successfully employ innovative financing tools (Boscoianu, Prelipcean, Calefariu, & Lupan, 2015).

The regulatory framework has been one of the greatest undoings for local firms. Over time, SMEs could not raise funds publicly due to stringent Capital markets Authority (CMA) regulations. However, the CMA report (2020) highlights the Growth Enterprise Market Segment (GEMS) establishment. GEMS allows venture companies with no prior profit history and SME-sized firms to list on the Nairobi Securities Exchange's GEMS to raise substantial initial and ongoing capital. These enterprises experience increased profile and liquidity within a regulated environment explicitly designed to meet their unique needs. GEMS also serves as an exit route for venture capitalists, private equity, entities, and family businesses.

Likewise, debate on blockchain-like technologies is ongoing to develop the necessary regulatory framework—limited options of raising the much-needed capital from the public force domestic SMEs to bank loans. The country's banking sector has experienced substantial changes over the last decade. For instance, the government had introduced interest rate control through Section 33B of the Banking (Amendment) Act, 2016. It provided for, among other things, a ceiling of 4% of commercial above the Kenya Bankers Reference Rate (KBRR). The Act got repelled in 2019 after pressure from international and domestic industry players. During the period, credit flow to private businesses fell drastically, with banks avoiding risky borrowers. On the converse, firms had expected easier access to cheap credit locally.

Moreover, Kenya, Eastern Africa's biggest economy, has the most developed financial sector. Be as it may, local banks have set standards to be met by firms seeking credit facilities. Further, banks have developed SMEs' dedicated products and relationships. Despite these efforts, the KNBS-MSME report (2016) found that the domestic start-ups' average life cycle is about 3.8 years. These firms cite substantial hurdles in accessing credit facilities from commercial banks as the main reason for failure. Apart from costs associated with bank loans, other conditions like providing significant collateral and other disclosure requirements remain challenging. On



the converse, freely available information has allowed firms to develop criteria for selecting their bank financiers.

Relevant agencies often experience regulatory challenges when dealing with commercial banks (Ashton, and Pressey, 2004). Part of the challenge pertains to increasing credit to the private sector which is part of the reason, Kenya introduced the short-lived interest rate controls. The CBK's persuasion of commercial banks to be moral in loan pricing seems not to work. SMEs deemed risky are locked out of credit facilities due to high costs. Banks exploit to the fullest flexibility accorded by the CBK in loan costing and remain opaque. Besides, corporate governance issues of the bank erode confidence in the banking systems. It explains the failure of three mid-tier banks between 2015 and 2016, namely Dubai, Imperial, and Chase bank. Besides, the regulatory framework, is the business model of each bank given attention?

The monetary policy committee (MPC) of an economy's Federal or Central bank determines the money quantity in circulation. Based on the prevailing business environment, a country may pursue an expansionary or contractionary monetary policy. Ultimately, the MPC dictates the amount of money available to domestic businesses by varying the interest rate. Taking the cue from MPC, commercial banks review the costing and terms of their credit facilities to businesses. Be as it may, in a free economy the forces of demand and supply should set credit facility pricing. While it was finally repealed, the introduction of interest rate controls between 2016 and 2019, significantly affected credit access by firms in Kenya.

Could it be a time that small and medium enterprises in emerging economies shifted their focus from the traditional financing sources? In these economies, when the financial system does not intermediate funds properly, then bank lending channels get impaired (Mishra, Montiel, and Spilimbergo, 2012). Presently, technology is leveling the playing field between SMEs and large firms in numerous ways. SMEs with profitable opportunities should tap into the "crypto" world. For instance, the initial coin offer (ICO) allows firms access to funds bypassing the stringent stock market requirements. However, a policy framework should be developed to safeguard investors' interests.

Besides, firms operate in a competitive environment and progressively innovate to thrive (Aksoy, 2017). Such innovation will ensure that their products (or services) reach untapped markets. The Kenyan MSME report found that of the four innovation types (product, process, organizational, and marketing), product innovation was the most preferred by domestic firms, specifically in manufacturing, information, communication & technology (ICT), financial, and

health activities. Nonetheless, process and marketing innovations were mainly not standard features among these firms. The findings suggest that domestic firms do not implement innovation activities regularly or prefer imitation rather than originality. Bearing this in mind, how resilient are domestic firms to changes in the business environment?

In conclusion, the present study explores how firm financing (bank-imposed conditions, external financial requirement & owner-manager perception of future finance availability), innovation-activity level, and firm characteristics (firm age & ownership type) correlate to performance. Specifically, the researcher explores bank-imposed conditions and the business environment's direct and indirect effects on performance. The indirect effect is through external financial requirements and innovation-activity levels. Further, the study examines the two factor's direct and indirect impact conditional on owner-manager perception and firm characteristics.

### **1.3 Significance of the Study**

It is no doubt that SMEs' play a critical role in economies the world over. Like in other emerging economies, Kenyan regulators in the financial sector often face impediments in channeling funds to deserving financially constrained firms. For instance, since the Global Financial Crisis (GFC), there is a growing trend in alternative financing. These include but are not limited to equity-based crowdfunding, debt-based securities, invoice trading, donation-based crowdfunding, and P2P business or consumer lending (Baeck, Collins, & Zhang, 2014). Also, the growth in fintech and crypto-based assets piles more pressure on regulators in growing economies. Macchiavello (2017) notes that a lack of clarity on alternative financing models may result in regulatory failure while overshadowing the banking industry.

Be that as it may, the majority of domestic businesses depend on traditional banking for credit. Unprecedented bank failures in the recent past as highlighted earlier threaten confidence in the banking sector. Such incidences result in the CBK continually reevaluating its monitoring efforts of the financial sector. For example, locally some of the banking industry regulations resulted in credit-constrained firms, particularly small to medium firms (Alper, Clements, Hobdari, Porcel, & Chief, 2019). A major concern for regulators about Kenyan banks are hidden costs that makes credit cost expensive. Often, the disparities between financial institutions are significant with CBKs moral persuasion not achieving the intended purpose. As stated elsewhere in this work, the study comes after two major incidences a short interval apart. One is the repealing of the interest rate controls in the formal banking sector. Two is the Covid-19 pandemic whose effects on firms are worldwide.

Likewise, domestic small to medium enterprises have low innovation-related activities as evidenced by a recent study. In extreme cases, some of these businesses never itemize such expenditure in the capital budgets. Poon (2000) suggests that there is a correlation between the business environment and the benefits firms can derive from innovation programs. The GFC and the Covid-19 pandemic are classical examples of why firms must engage in innovation activities. Domestic firms that are subsidiaries of multinational firms usually benefit from external technology transfer (Howells, 1998). That notwithstanding, firms may obtain technology through collaborations with higher learning or research institutions (Fitjar & Rodríguez-Pose, 2013; Kafouros, Wang, Piperopoulos, & Zhang, 2015). Of concern then is, are local firms willing to invest in partnership with local academic institutions? Better still, how many of these small to medium enterprises have an R&D department with dedicated staff?

When firms overcome some of these challenges by registering sustained success, they may eventually shade off the SME tag by breaking into the large firms' category. Unfortunately, small and medium enterprises face hurdles in raising funds externally as if the challenge of insufficient internal financial resources is not enough. Whereas technology offers immense opportunities to these firms, innovative financing tools remain elusive for local firms. On a brighter note, SMEs with profitable investment opportunities and good relationships with their bankers can access finance. The current study on entrepreneurial financing and innovation is a step in the right direction. The findings provide a more in-depth and scientific understanding of the bank financing-SMEs relationship based on these firms' innovative nature.

Besides, these results may be a point of reference for future decision-making by relevant industry players. The study period is three years, 2017-2019, particularly regarding innovation activities. Two reasons justify the period; one, most scholars support a medium-term duration in appraising innovation-related activities. Two, technology and or innovation change rapidly, rendering what was "new yesterday completely obsolete today" (Heredia Pérez, Geldes, Kunc, & Flores, 2019; Saunila, 2017b). The study confines itself to the study variables and their boundaries. Below are the research questions guiding the study.

#### **1.4 Objectives of the Study**

The study's objectives are divided into two, namely, general and specific. Whereas the general goal broadly examines the research's pillars, the other explicitly focuses on each particular factor.

##### **1.4.1 General Objective**

The study's general objective is to examine the bank-imposed conditions and the business environment's direct, indirect, and conditional effects on Kenyan firms' performance.

#### **1.4.2 Specific Objectives**

The specific objectives are to:

- i. Establish bank imposed conditions (BIC) and business environment's (BE) direct effect on the performance and their indirect impact through external finance requirement (FR) and innovation-activity level (IAL).
- ii. Explore the owner manager's perception (OMP) of future finance availability's effect on the BIC and BEs' influence on performance.
- iii. Determine BIC and BE's indirect effect on firm performance conditional on ownership type
- iv. Investigate ownership type and firm age's role in the relationship between the two factors (BIC & BE) and the outcome variable.

#### **1.5 Research Hypotheses**

The study has four main hypotheses anchored on the research objectives. These are:

- i. **H1(a):** Bank-imposed conditions and the business environment have no meaningful effect on external financial requirements, either separately or jointly
- ii. **H1(b):** Bank-imposed conditions and the business environment have no meaningful effect on the innovation-activity level, either separately or jointly
- iii. **H1(c):** Bank-imposed conditions and the business environment jointly have a strong influence on the innovation-activity level through external financial requirements
- iv. **H1 (d):** Bank-imposed conditions and the business environment have a direct, meaningful effect on firm performance.
- v. **H1 (e):** Bank-imposed conditions and the business environment's direct and mediated effects on the firm performance are definitively different from zero.
- vi. **H2:** The moderating effect of owner-manager perception of future finance availability on the BIC and BE's effect is robustly different from zero.
- vii. **H3:** Ownership type substantially influences BIC and BE's indirect effect on performance. Besides, it strongly correlates to external FR and IAL.
- viii. **H4:** BIC and BE's effect on performance conditional on ownership type and firm age is not statistically different from zero.

## 1.6 Conceptual Framework

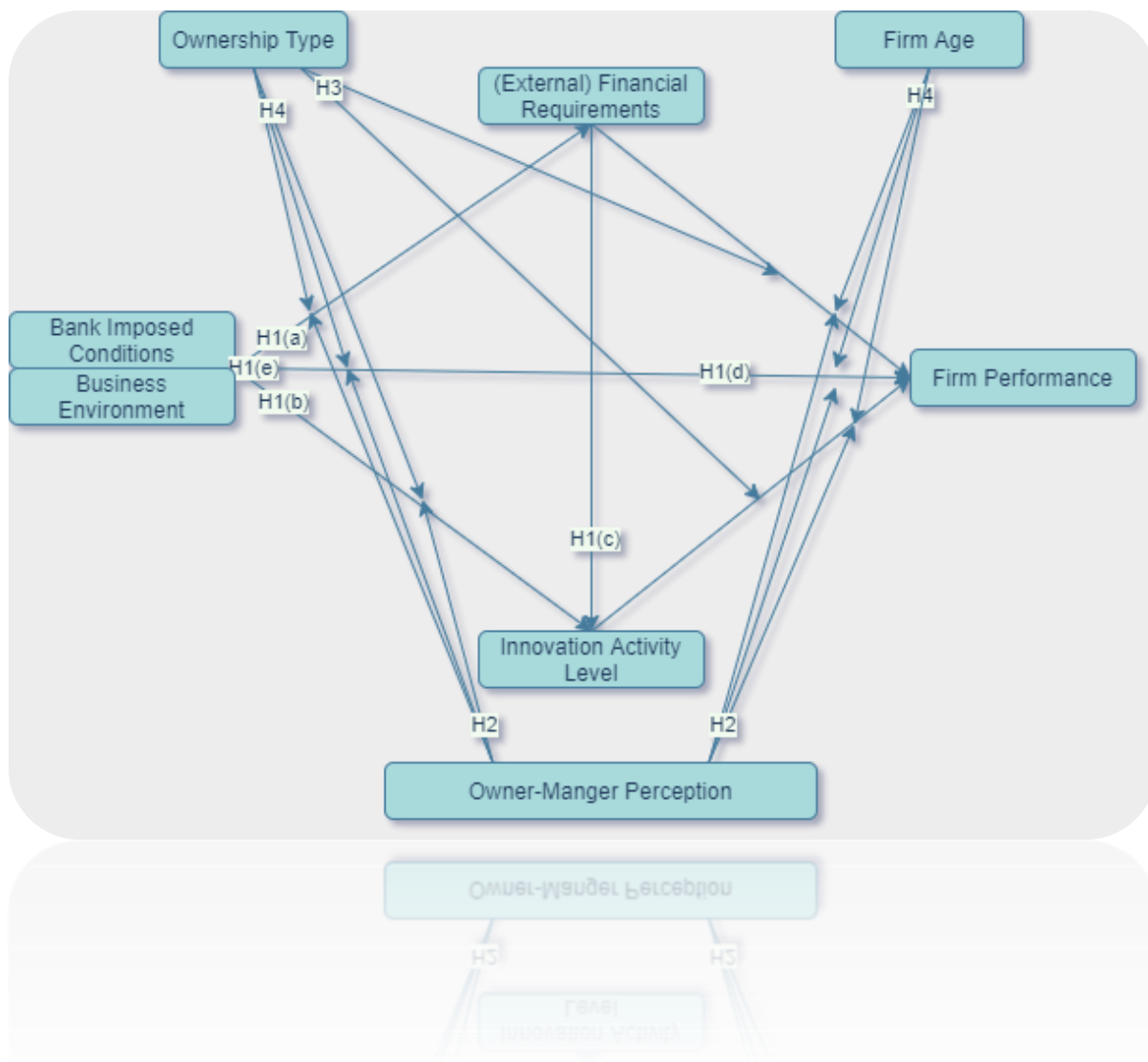
The conceptual framework depicted in figure 1 summarizes how the study factors relate. The researcher recommends interpreting the figure with each hypothesis's specific conceptual framework (appendices) and statistical framework (next chapter). Nevertheless, the first hypothesis has five sub-hypotheses and assumes the absence of owner-manager perception, ownership type, and firm age.

The hypothesis assumes that the model's main predictors (bank-imposed conditions and the business environment) affect performance directly and indirectly. The predictors indirectly affect the outcome through the mediators (external financial requirements and the innovation-activity level). The direct pathway is  $(X \rightarrow Y)$ , whereas the indirect effect is  $(X \rightarrow M \rightarrow Y)$ .

The second hypothesis builds on the first one and introduces the first moderator, the owner-manager perception of future finance availability—which conditions the predictors' direct and indirect effects on performance. Directly, it conditions the path between the predictors and the outcome variable. Indirectly, it conditions the predictors' impact on the mediators (FR and IAL) and; the association between the mediators and the dependent variable. Precisely, the OMP direct effect is  $(X \rightarrow Y)$  and indirectly  $(X \rightarrow M \rightarrow Y)$ .

The third hypothesis introduces the second mediator, ownership type while excluding the OMP. The theory assumes three different indirect effects as illustrated in the specific conceptual framework  $(Xs \rightarrow M_1 \rightarrow M_2 \rightarrow Y)$ ;  $(Xs \rightarrow M_1 \rightarrow Y)$ ; and  $(Xs \rightarrow M_2 \rightarrow Y)$ . Be as it may, ownership type influences the first and third indirect effects at  $(M_2 \rightarrow Y)$  and at  $(M_1 \rightarrow Y)$  for the second indirect effect. Like in the first hypothesis, external FR is presumed to influence IAL.

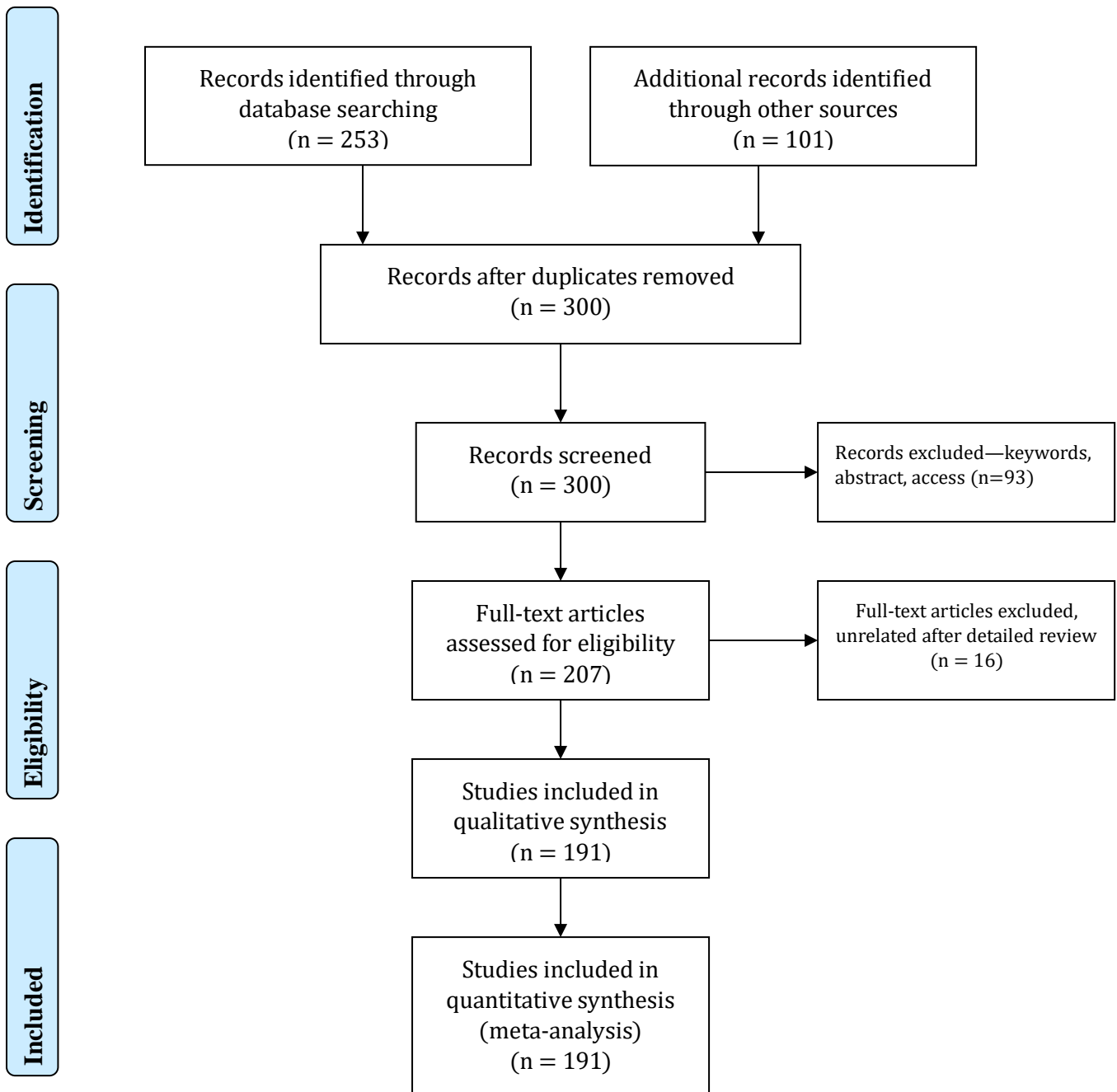
The fourth hypothesis builds on the third one by introducing firm age. Thus, ownership type and firm age simultaneously affect the predictors' direct and indirect outcomes. In particular, ownership type conditions the relationship between the predictors and the mediators  $(Xs \rightarrow M)$  and firm age, the correlation between the mediators, and performance  $(M \rightarrow Y)$ . Further, both OT and FA simultaneously influence the direct association between the predictors and the outcome  $Xs \rightarrow Y$ .



**Figure 1. 1 Conceptual Framework**  
 Source: Author's Conceptualization

## LITERATURE REVIEW

The literature review followed the PRISMA process as illustrated below.



**Figure 2. 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses Flow-Chart**

Source: Adopted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009).

## MATERIAL AND METHODS

### 3.1 Questionnaire Design and Development (*Original Sources of the Questionnaire*)

The first tool is the *European Commission and European Central Bank Survey on SMEs' access to finance* questionnaire by European Central Bank (2009). The survey assisted the European Commission with evidence for policymaking to improve businesses' financial access and European Central Bank monetary policy formulation. The second tool is the *Community Innovation Survey (CIS 4)* by Eurostat (2004). Be as it may, the researcher is cognizant of different updated versions of CIS as found at <https://ec.europa.eu/eurostat/web/microdata/community-innovation-survey>.

**Table 3. 1 A Brief Outlay of the Questionnaire**

Construct		Questi
Sections	Section Description	ons
Firm		
characteristics	Demographics, age*, ownership, sector, size, etc.	<b>FC1-5</b>
Financing	Financial requirements & Sources, bank conditions, perception	<b>FF1-7</b>
Business		
environment	The country's general economic and remote & task firm environment	<b>BE1</b>
Innovation	The product, process, marketing, and organizational innovation-related activities initiated by the firm.	<b>IAL1-4</b>
Performance	Financial (revenue-related) and non-financial (operational-related) parameters	<b>FP1-7</b>

Source: Author's construction based on previously used tools and existing literature

### 3.2 Models Specification and Statistical Software

Three statistical software performed the analysis, namely, R studio (v4.3.0), SPSS (v25), and Process Macro (v3.5). Process Macro runs on the SPSS platform and has specific advantages. The software can handle complicated conditional relationship analyses. Still, it automatically addresses particular OLS assumptions violated by the data used. One cornerstone of this study is the integration of mediation and moderation models. Feng, Song, Zhang, Zheng, and Pan (2020) highlight four approaches that test the integration of the two types of models. They include product indicator analysis (PI, unconstrained approach, and constrained approach), path analysis (PA), and latent moderated structural equations (LMS). Specifically, the current study focuses on two types of integrated moderated mediation namely, PA and LMS.

#### 3.2.1 Model One: The Mediation Model (*Statistical framework in the main document*)



1. Three structural equation models summarize the predictors ( $X_s$ ) effect on firm performance ( $Y$ )

$$M_1 = i_{M1} + a_1X_1 + a_2X_2 + e_{M1} \dots \dots \dots (i)$$

$$M_2 = i_{M2} + a_3X_1 + a_4X_2 + d_1FR + e_{M2} \dots \dots \dots (ii)$$

$$Y = i_Y + b_1M_1 + b_2M_2 + c'_1X_1 + c'_2X_2 + e_Y \dots \dots \dots (iii)$$

Where: ( $i_M$ ) and ( $i_Y$ ) are the intercept terms, ( $a_s$ ) ( $b_s$ ) and ( $d_1$ ) regression estimates while ( $e_{ij}$ ), the error terms.

2. The ‘Product of the Coefficients’ tests the predictors’ indirect effect (pathway significance). The three indirect paths are:

$$\text{via } M_1 = (a_1 + a_2)b_1 \dots \dots \dots (iv)$$

$$\text{via } M_2 = (a_3 + a_4)b_2 \dots \dots \dots (v)$$

$$\text{via both mediators} = (a_1 + a_2) * d_1 * b_2 \dots (vi)$$

3. Pathway contrast:

$$\text{Cont 1} = (a_1 + a_2)b_1 - (a_3 + a_4)b_2 \dots \dots (vii. a)$$

$$\text{Cont 2} = (a_1 + a_2)d_1 * b_2 - (a_1 + a_2)b_1 \dots (vii. b)$$

$$\text{Cont 3} = (a_1 + a_2)d_1 * b_2 - (a_3 + a_4)b_2 \dots (vii. c)$$

4. The predictors’ effects:

- Total indirect effects:

$$= (a_1 + a_2)b_1 + (a_3 + a_4)b_2 + (a_1 + a_2)d_1 * b_2 \dots (viii. a)$$

- The direct effects

$$= c_{dash1} + c_{dash2} \dots \dots \dots (viii. b)$$

- The total effects (indirect plus direct)

$$Y = i_Y + b_1M_1 + b_2M_2 + c_1X_1 + c_2X_2 + e_Y \dots (viii. c)$$

5. The proportion mediated:

$$P_M = \frac{\text{Total Indirect Effect}}{\text{Total Effect}} \dots \dots \dots (ix)$$

### 3.2.2 Model Two: The Three-Way Moderated Mediation Model

6. BIC and BE’s indirect effect on the performance conditional on OMP:

$$M_1 = i_{M1} + a_{11}X_1 + a_{12}X_2 + a_{31}X_1Q + a_{32}X_2Q + a_{51}Q + e_Y \dots \dots \dots (x)$$

$$M_2 = i_{M2} + a_{21}X_1 + a_{22}X_2 + a_{41}X_1Q + a_{42}X_2Q + a_{52}Q + e_Y \dots \dots \dots (xi)$$

7. BIC and BE’s direct effect on the performance conditional on OMP:

$$= c_1X_1 + c_2X_2 + c_3X_1Q + c_4X_2Q \dots \dots \dots (xii)$$

8. Total effect:

$$Y = i_Y + b_1M_1 + b_2M_2 + b_3M_1Q + b_4M_2Q + c_1X_1 + c_2X_2 + c_3X_1Q + c_4X_2Q + c_3Q + e_Y \dots \dots \dots (xiii)$$

9. The proportion mediated conditional on OMP:

$$P_M = \frac{\text{Indirect Effect}}{\text{Total Effect}} \dots \dots \dots (xiii)$$

10. The index of moderated mediation tests the pathway significance:

$$im_1 = (a_{31} + a_{32})b_1 + (a_{11} + a_{12})b_3 + (a_{31} + a_{32})b_3 \dots \dots \dots (ix. a)$$

$$im_2 = (a_{41} + a_{42})b_2 + (a_{21} + a_{22})b_4 + (a_{41} + a_{42})b_4 \dots \dots \dots (ix. b)$$

### 3.2.3 Model Three: The Indirect Effect Conditional Model

\* $i$  is the ownership type under considerations

11. The model's three equations are:

- Predictors' effect on mediators

$$M_1 = i_{M1} + a_{11}X_1 + a_{12}X_2 + e_{M1} \dots \dots \dots (x)$$

$$M_2 = i_{M2} + a_{21}X_1 + a_{22}X_2 + d_1M_1 + e_{M2} \dots \dots \dots (xi)$$

- Total effect (direct and indirect)

$$Y = i_Y + b_1M_1 + b_2M_2 + b_3W + b_4M_1 + b_5M_2 + c'_2X_1 + c'_2X_2 + e_Y \dots (xii)$$

12. Breaking down the total effect

- Three indirect conditional effects conditional on W:

$$= (a_{11} + a_{12})(b_1 + b_4W) \dots \dots \dots (xiii.a)$$

$$= (a_{21} + a_{22})(b_2 + b_5W) \dots \dots \dots (xiii.b)$$

$$= d_1(a_{11} + a_{12})(b_2 + b_5W) \dots \dots \dots (xiii.c)$$

- The direct effects:

$$= c'_2X_1 + c'_2X_2 \dots \dots \dots (xiv)$$

### 3.2.4 Model Four: The Moderated-Moderated Mediation Model

The three model equations are:

- The predictors' direct effect on the mediators:

$$M_1 = i_{M1} + a_{11}X_1 + a_{12}X_2 + a_{31}X_1W + a_{41}X_2W + a_{51}W \dots \dots (xv)$$

$$M_2 = i_{M2} + a_{21}X_1 + a_{22}X_2 + a_{32}X_1W + a_{42}X_2W + a_{52}W \dots \dots (xvi)$$

$$Y = i_Y + b_1M_1 + b_2M_2 + b_3M_1Z + b_4M_2Z + c'_2X_1 + c'_2X_2 + c'_3W + c'_4Z + c'_5X_1W + c'_6X_2W + c'_7X_1Z + c'_8X_2Z \dots \dots \dots (xvii)$$

13. The predictors' indirect effect conditional on W and Z:

$$\text{Via } M_1 = [a_{51}W(a_{11} + a_{12})](b_1 + b_3V) \dots \dots (xviii.a)$$

$$\text{Via } M_2 = [a_{52}W(a_{21} + a_{22})](b_2 + b_4V) \dots \dots (xviii.b)$$

14. The predictors' direct effect conditional on W and Z:

$$= c'_2X_1 + c'_2X_2 + c'_3W + c'_4Z \dots \dots \dots (xix)$$

\* (i) and (j) represents ownership type and firm age category under consideration, respectively.

**Table 3.2 Technical sheet**

Geographical area	Nationwide
Target sectors	All except firms in the financial sectors
Data instrument	Questionnaire
Target firms	Small and medium enterprises
Contacted firms	1000 companies
Total Response	260 firms
Sample size (Analysed)	198 businesses
Participation rate	26 percent
Between 11-49 workers	37.65 percent
Between 50-99 workers	62.35 percent
Confidence level	95 percent
Duration of fieldwork	2020 to 2021

Source: Author

## RESULTS AND DISCUSSIONS

The section presents test results of the study hypotheses with emphasis on significant findings. Some results are edited and other tables are omitted from the short version for convenience reasons.

### 4.1 CFA Fit Measure Indices

All three indices are within acceptable levels implying that the items fit appropriately under their respective factor. CFA was crucial in deriving average extracted variance (AVE). AGFI  $\geq 0.90$ , suggests a good fit (Baumgartner and Homburg, 1996). West, Taylor, and Wu (2012) advise that CFI  $\geq 0.95$  is a good fit; however, values above 0.90 are equally acceptable. SRMR is the square root of the variation between the model's covariance matrix and the sample covariance matrix. SRMR values  $< 0.08$  are acceptable and indicate a low insufficient fit level (Bentler, 1990).

**Table 4. 1 CFA Fit Measure Indices**

Index	Fact.1	Fact.2	Fact.3	Fact.4	Fact.5	Fact.6
Adjusted Goodness of Fit	0.901	0.902	0.911	0.941	0.956	0.900
Comparative Fit Index	0.904	0.906	0.907	0.904	0.926	0.905
Standardized Root Mean Square Residual	0.04	0.053	0.064	0.074	0.056	0.05

Source: R program Output

**Table 7** presents the model validity and reliability tests. Based on the findings, the values are within an acceptable range after deleting specific items described under their constructs. The Composite Reliability ranges from 0.708 to 0.935 while AVE is above 0.5. The results are evidence that the study fulfills convergent validity and construct reliability requirements.

**Table 4. 2 Continuous Factor Convergent Validity and Internal Consistency Test Results**

Constructs	Cronbach's Alpha	Composite Reliability	Average Variance Extracted	Items Deleted*
<b>FP</b> Firm Performance	0.786	0.787	0.552	1
<b>BIC</b> Bank imposed Conditions	0.916	0.935	0.71	Nil
<b>BE</b> Business Environment	0.828	0.769	0.507	Nil
<b>OMP</b> Owner-Manager Perception	0.786	0.757	0.586	Nil
<b>FR</b> Financial Requirements	0.775	0.859	0.605	1
<b>IAL</b> Innovation Activity Level	0.709	0.705	0.536	3

Source: SPSS Output

\* Number of items per construct after deleting those with low loadings

### 4.2 BIC and BE's Mediated Effect on Performance

Considering  $M_1$ , the banks' imposed conditions (BIC) before access to credit facilities' effect on a firm's finance requirement (FFR) is definitively different from zero—as the bootstrap confidence interval has no zero ( $a_1 = 0.443; p = 0.000; CI = 0.315 \text{ to } 0.679$ ). Likewise, the business environment (BE) has a positive effect, but this is insignificant since the bootstrap confidence interval contains a zero ( $a_2 = 0.080; p = 0.279; CI = -0.104 \text{ to } 0.371$ ). For  $M_2$ , the test results show that the business environment's effect on innovation-activity level (IAL) is distinctly different from zero ( $a_4 = 0.373; p = 0.000; CI = 0.028 \text{ to } 0.086$ ).

Moreover, finance requirement substantially mediates the correlation between predictors and performance, pathway ( $\theta_{M_1 \rightarrow Y}$ ) However, while statistically significant, it negatively mediates this relationship ( $b_1 = -0.246; p = 0.000; CI = -0.211 \text{ to } -0.061$ ). The two predictors have a substantial positive influence on performance based on the PCI. In particular, ( $c_1 = 0.273; p = 0.001; CI = 0.071 \text{ to } 0.275$ ) for BIC and; ( $c_2 = 0.442; p = 0.000; CI = 0.241 \text{ to } 0.487$ ) for BE. Moreover, value standardization is essential for variable loading comparison—thus, BE (0.442) strongly loads on performance more than BIC (0.273).

**Table 4. 3 Structural Equation Modeling Estimates, Standard Errors, and  $p$ -value**

Antecedent	Estimate	SE. <i>boot</i>	$P$ -value	95% PCI
$X_1; M_1: \text{BIC} \rightarrow \text{Fin. Req.}$	$a_1 = 0.443$	0.091	0.000	0.315—0.676
$X_2; M_1: \text{BE} \rightarrow \text{Fin. Req.}$	$a_2 = 0.080$	0.120	0.276	-0.104—0.371
$X_1; M_2: \text{BIC} \rightarrow \text{Inno. Act}$	$a_3 = -0.075$	0.010	0.494	-0.026—0.012
$X_2; M_2: \text{BE} \rightarrow \text{Inno. Act}$	$a_4 = 0.373$	0.015	0.000	0.028—0.086
$M_1; M_2: \text{BIC \& BE} \rightarrow \text{FR} \rightarrow \text{IA}$	$d_1 = 0.144$	0.009	0.274	-0.007—0.025
$M_2; Y: \text{Fin Req} \rightarrow \text{Perform}$	$b_1 = -0.246$	0.038	0.000	-0.211— -0.061
$M_1; Y: \text{Innovation} \rightarrow \text{Perform}$	$b_2 = -0.091$	0.339	0.144	-1.274—0.060
$Cdash1: \text{BIC} \rightarrow \text{Perform}$	$c_1 = 0.273$	0.051	0.001	0.071— 0.275
$Cdash2: \text{BE} \rightarrow \text{Perform}$	$c_2 = 0.442$	0.063	0.000	0.24— 0.4870

Source: Test results from the R program

\* PCI= Percentile confidence level based on 5,000 bootstrap iterations; SE.*boot*= Bootstrapped standard error

#### 4.2.1 The Indirect Effects (Product of Coefficients Test)

The coefficients product shows that BIC and BE's indirect impact on the performance through finance requirements is definitively different from zero ( $ab_1 = -0.086; p = 0.006; CI = -0.155 \text{ to } -0.032$ ). That is, the two predictors have a negative influence on the outcome variable. There is a significant difference in the coefficient products for pathways ( $\theta_{X \rightarrow M_1 \rightarrow M_2 \rightarrow Y}$ ) and ( $\theta_{X \rightarrow M_1 \rightarrow Y}$ ) which is ( $k_2 = 0.074; p = 0.007; CI = 0.032 \text{ to } 0.155$ ).

Thus, there is a substantial difference in BIC and BE's indirect effect through mediators and finance requirements. However, with the indirect effect through both mediators being insignificant, there is no reason to probe further the differences.

Moreover, BIC and the BE's total indirect effect on performance is statistically different from zero based on the PCI ( $i_t = -0.100; p = 0.004; CI = -0.200 \text{ to } -0.047$ ). Still, the total effect (direct and indirect) is substantial ( $t_2 = 0.442; p = 0.000; CI = 0.332 \text{ to } 0.570$ ). That notwithstanding, these factors account for 23.6% of the finance request change, 16% for innovation activities, and performance at 29.7%. R-squared represents the proportion of variance in the outcome variable explained by the predictors, while adjusted R-squared estimates the population (Miles, 2014).

**Table 4. 4 Test Results for the Product of Coefficients and Path Contrasts**

Antecedent	Estimate	SE <sub>boot</sub>	p-value	95% PCI
Indirect Effect 1: $(a_1 + a_2)b_1$	$ab_1 = -0.086$	0.031	0.006	-0.155 – -0.032
Indirect Effect 2: $(a_3 + a_4)b_2$	$ab_2 = -0.025$	0.020	0.212	-0.074 – 0.003
Indirect Effect 3: $d_1(a_3 + a_4)b_2$	$ab_3 = 0.000$	0.000	0.169	-0.001– 0.000
Cont. 1: $(a_1 + a_2)b_1 - (a_3 + a_4)b_2$	$k_1 = -0.062$	0.035	0.082	-0.133– 0.008
Cont. 2: $d_1(a_3 + a_4)b_2 - (a_1 + a_2)b_1$	$k_2 = 0.074$	0.029	0.007	0.032 – 0.155
Cont.3: $d_1(a_3 + a_4)b_2 - (a_3 + a_4)b_2$	$k_3 = 0.024$	0.020	0.215	-0.003– 0.073
Total Indirect Effect: $ie_1 + ie_2 + ie_3$	$i_t = -0.111$	0.039	0.004	-0.200 – -0.047
Total Effect : $cdash_1 + cdash_2 + i_t$	$t_2 = 0.442$	0.061	0.000	0.332 – 0.570
R Square Estimates:	Performance	0.297		
	Finance Req.	0.236		
	Innovation	0.160		

Source: Test results from the R program

\* PCI= Percentile confidence level based on 5,000 bootstrap iterations; SE<sub>boot</sub>= Bootstrapped standard error

#### 4.2.3 The Effect Size

The first two effects are for mediators in a parallel format and the last in serial. The proportion of BIC and BE's indirect to total effect (via external finance requirements) is distinctively different from zero based on the percentile CI ( $P_{M1} = -0.193, CI = -0.382 - -0.071$ ). The indirect effect of the two predictors accounts for approximately 20% of the variance in performance. The negative correlation indicates the effect nature, adverse.

**Table 4. 5 The Ratio of the Indirect Effect to the Total Effect**

Proportion Mediated	Effect Size	SE <sub>boot</sub>	95% PCI
Prop. Mediated 1: Indirect 1/Total Effect	$P_{M1} = -0.193$	0.082	-0.382—-.071
Prop. Mediated 2: Indirect 2/Total Effect	$P_{M2} = -0.064$	0.194	-0.183—0.009
Prop. Mediated 3: Indirect 3/Total Effect	$P_{M3} = -0.001$	0.273	-0.002—0.001

Source: Test results from the R program

Interchanging the terms gives the best appropriate mediation equation models as:

1. BIC and BE's effect on the mediators: Path Path ( $a\theta_{X \rightarrow M}$ );

$$FR = -4.099 + 0.443BIC + 0.080BE$$

$$IAL = 0.127 - 0.075BIC + 0.3736BE + 0.144FR$$

2. The outcome (total effect): Path ( $c_{dash}$ );

$$Perform = -0.534 - 0.246FR - 0.091IAL + 0.273BIC + 0.442BE$$

#### 4.2.4 Model Fit Assessment

The comparative fit index (CFI) by Bentler (1990) measures the relative improvement in model fit, moving from the baseline model to the postulated model. CFI is a normed fit index ranging between 0 and 1, with high values indicating a better fit. West, Taylor, and Wu (2012) advise that for a good fit,  $CFI \geq .95$ . The Tucker–Lewis index (TLI) quantifies a relative reduction in misfit per degree of freedom (Tucker and Lewis, 1973). Higher TLI values indicate a better fit for the model. The index being non-normed is not required to be between 0 and 1. Whereas values larger than 0.95, the cut-off value acceptable in a great deal of research is 0.97.

**Table 4.6 Model Fit Test Results**

	Index	Statistic
1.	Comparative fit index (CFI)	0.99
2	Tucker–Lewis index (TLI)	1.00

Source: R-studio Output

#### 4.2.5 Owner-Manager Perception of Future Finance Availability on the Mediated Correlation between the Predictors and the Outcome.

The perception of future finance availability substantially affects external finance requirements ( $a_{51} = 0.404; p = 0.000$ ). OMP's interaction with the predictors has a discernible effect on the mediators ( $a_{31} = 0.356; p = 0.000$ ). On the converse, it has a negative moderating effect in the case of the business environment ( $a_{32} = -0.258; p = 0.014$ ). The effects are statistically different from zero based on the bias-corrected and accelerated (BCa) bootstrap CI. Further, OMP robustly moderates BE's effect on IAL since there is no zero in the BCa CI ( $a_{42} = -0.041; CI = -0.068 - -0.015$ ). OMP substantially moderates external FR and

performance's association ( $b_3 = 0.101$ ;  $CI = 0.001 - 0.033$ ). These factors and interactions account for 43% of the external FR's change and 25.9% for IAL. More specifically, they account for 58.4% of the change in performance, which is quite substantial.

**Table 4.7 Structural Equation Modeling Estimates of BE and BIC's Indirect Effect Conditional on Owner-Manager Perception**

Antecedent	Outcome								
	Financial	(M1)			(M2)			Performance (Y)	
		Coefficient	p-value	95% BCA CI	Innovation	P-value	95% BCA		Coefficient
$X_1$ : Bank Cond	$a_{11} = \mathbf{0.503}$	0.000	0.371—0.640	$a_{21} = -0.007$	0.419	0.297—0.538	$c_1 = \mathbf{0.134}$	0.007	0.043—0.242
$X_2$ : Business Environment	$a_{12} = -0.056$	0.609	-0.276—0.158	$a_{22} = \mathbf{0.062}$	0.000	0.038—0.087	$c_2 = \mathbf{0.419}$	0.000	0.297—0.538
$X_1W$ : BIC * OMP	$a_{31} = \mathbf{0.356}$	0.000	0.229—0.483	$a_{41} = -0.009$	0.284	0.026—0.007	$c_3 = .047$	0.253	-0.127—0.031
$X_2W$ : BE * OMP	$a_{32} = -\mathbf{0.258}$	0.014	-0.453—-0.045	$a_{42} = -\mathbf{0.041}$	0.002	0.068—0.015	$c_4 = -0.086$	0.105	-0.186—0.021
W: OM-Perception	$a_{51} = \mathbf{0.404}$	0.000	0.246—0.557	$a_{52} = 0.011$	0.199	0.006—0.027	$c_5 = 0.400$	0.031	0.063—0.783
$M_1W$ : Fin. Req. * OMP							$b_3 = \mathbf{0.101}$	0.014	0.001—0.033
$M_2W$ : Inno. Act * OMP							$b_4 = 0.617$	0.072	-0.157—1.550
				$R^2_{M2} = 0.412$		$R^2_{M2} = 0.20$			$R^2_Y = \mathbf{0.588}$

Source: Test results from the R program

#### 4.2.6 The Effect Size and Conditional Effects

The indirect predictors' effect (via external financial requirements) is definitively different from zero at one SD above the mean. That is, ( $ab_2 = 0.060$ ;  $CI = -0.127 - -0.018$ ), for path [ $a(\theta_{(X1;X2 \rightarrow M1 \rightarrow Y)})b$ ]. Notably, such a conditional effect inversely relates to the outcome variable. Moreover, the predictors have a substantial direct influence on performance conditional on OMP at both standard deviations—( $c_i = 0.689$ ;  $CI = 0.548 - 0.864$ ) at one-SD below the mean and ( $c_{ii} = 0.418$ ;  $CI = 0.027 - 0.557$ ) at one-SD above. Similarly, the total effect (direct and indirect) is conclusively different from zero at the deviation, based on the BCA CI. Specifically, ( $ab_5 = 0.613$ ;  $CI = 0.473 - 0.774$ ) at one-SD below the mean and ( $ab_7 = 0.357$ ;  $p = 0.073$ ).

The table shows a proportion of BIC and BE's mediated effect on the outcome conditional on OMP at both SDs. The ratio is definitively different from zero for one SD above the mean since there is no zero in the percentile CI ( $P_{M2} = -0.170$ ;  $p = 0.108$ ). Approximately 17% of the predictors' mediated effect on performance is conditional on the owner-manager perception of future finance availability.

**Table 4. 8 Results of the Direct and indirect Effects Conditional on OMP**

Indirect Effect					Pathway	Direct Effect		
Pathway	Deviation	Estimate	Std. Dev	95% BCA CI		Estimate	Std. Dev	95% BCA CI
$a(\theta_{(X1;X2 \rightarrow M1 \rightarrow Y)})$	One-SD Below Mean	$ab_1 = -.038$	0.028	-0.114 - -0.000	$\theta_{(cdash1;2 \rightarrow)}$	$c_i = \mathbf{0.689}$	0.008	0.548 - 0.864
	One-SD Above Mean	$ab_2 = -.060$	0.027	-0.127 - -0.018				
Total Conditional Effect						Mediated		
	One-SD Above Mean	$ab_5 = \mathbf{.613}$	0.075	0.471 - 0.774		$P_{M1} = -0.124$	0.101	-0.368 - 0.023
	One-SD	$ab_7 = \mathbf{.357}$	0.073	0.216 - 0.501		$P_{M1} = -\mathbf{0.17}$	0.108	-0.460 -



below Mean							0.037
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Source: Test results from the R program

Substituting the terms results in best-fitting OLS equations:

1. BIC and BE's effect on external FR and IAL: Path ( $a\theta_{X \rightarrow M}$ );

$$FR = -4.27 + 0.503BIC - 0.056BE + 0.356BIC * OMP - 0.258BE * OMP + 0.404OMP + 0.797CS$$

$$IAL = 0.009 - 0.009BIC + 0.062BE - 0.009BIC * OMP - 0.041BE * OMP + 0.011OMP + 0.113CS$$

2. BIC and BE's indirect effect conditional on OMP: Path ( $a\theta_{X \rightarrow M}$ ) $b$ ;

$$\begin{aligned} \text{Via } FR &= [(0.503 - 0.056) + OMP(0.356 - 0.258)][-0.109 + 0.016OMP] \\ &= (0.447 + 0.098OMP)(-0.109 + 0.016OMP) \\ &= 0.044 - 0.002OMP \end{aligned}$$

$$\begin{aligned} \text{Via } IAL &= [(-0.009 + 0.062) + OMP(-0.009 - 0.041)][-0.358 + 0.787OMP] \\ &= (0.053 - 0.05OMP)(-0.358 + 0.787OMP) \\ &= -0.019 + 0.021OMP \end{aligned}$$

$$\begin{aligned} \text{Total indirect} &= (0.044 - 0.002OMP) + (-0.019 + 0.021OMP) \\ &= 0.025 + 0.019OMP \end{aligned}$$

3. BIC and BE's direct effect conditional on OMP: Path ( $c\theta_{X \rightarrow M}$ );

$$\begin{aligned} &= (0.134 + 0.419) + (0.101 + 0.617)OMP \\ &= 0.553 + 0.718OMP \end{aligned}$$

4. The outcome (total effect)

$$\begin{aligned} Perf &= -0.449 + 0.134BIC + 0.419BE + 0.047BIC * OMP - 0.086BE * OMP \\ &\quad + 0.4OMP - 0.109FR - 0.358IAL + 0.016FR * OMP + 0.787IAL * OMP \end{aligned}$$

#### 4.2.7 Model Fit Assessment

The indices are within acceptable limits, for instance, the RMSE = 0.070 (empirical evidence places values below 0.08 within an acceptable range).

**Table 4.9 Model Fit indices**

	Index	Statistic
1.	Comparative fit index (CFI)	0.900
2.	Tucker-Lewis index (TLI)	0.905
3.	Root mean square error of approximation (RMSEA)	0.070

Source: Test results from the R program

#### 4.3 Ownership Type Influence on BIC and BE's Indirect Effect on Performance

Privately listed firms have significantly superior performance than the referent group ( $b_{35} = 0.324$ ,  $CI = 0.062 - 0.586$ ). Still, affiliates ( $b_{44} = 0.392$ ,  $CI = 0.195 - 0.588$ ) and privately listed businesses ( $b_{45} = 0.914$ ,  $CI = 0.438 - 1.389$ ), positively and significantly moderate the correlation between finance requirements and performance than the referent group. All these factors and their interaction account for 39.6% of the change in performance.

**Table 4. 10 Ordinary Least Squares Regression Coefficients of BE and BIC's Indirect Effect on the Outcome Variable Conditional on Ownership**

Antecedent	Coefficient		95% Percentile
	( $SE_{boot}$ )	<i>P value</i>	Bootstrap CI
$X_1$ : Bank-Imposed Cond.	$c_1 = 0.179(0.049)$	0.000	0.082—0.276
$X_2$ : Business Environment	$c_2 = 0.408(0.063)$	0.000	0.284—0.531
$W_1$ : Male-Owned	$b_{31} = 0.019(0.101)$	0.850	-0.180—0.218
$W_2$ : Female-Owned	$b_{32} = 0.147(0.302)$	0.627	-0.448—0.743
$W_3$ : Family-Owned	$b_{33} = -0.203(0.403)$	0.616	-1.000— 0.592
$W_4$ : Affiliate	$b_{34} = 0.048(0.122)$	0.698	-0.194— 0.289
$W_5$ : Privately Listed	$b_{35} = 0.324(0.133)$	0.016	0.062—0.586
$M_1; M_2$ : Fin. Req~ Inno. Act	$d_1 = 0.017(0.009)$	0.274	-0.009—0.023
$M_1W_1$ : Fin Req. * Male-Owned	$b_{41} = -0.025(0.069)$	0.717	-0.162—0.112
$M_1W_2$ : Fin Req. * Female-Owned	$b_{42} = -0.082(0.018)$	0.477	-0.023—0.049
$M_1W_3$ : Fin Req. * Family-Owned	$b_{43} = 0.235(0.492)$	0.633	-0.736—1.207
$M_1W_4$ : Fin Req. * Affiliate	$b_{44} = 0.392(0.100)$	0.000	0.195—0.588
$M_1W_5$ : Fin Req. * Privately Listed	$b_{45} = 0.914(0.241)$	0.000	0.438—1.389
$M_2W_1$ : Inno. Act * Male-Owned	$b_{51} = -3.083(3.015)$	0.308	-9.033—2.867
$M_2W_2$ : Inno. Act * Female-Owned	$b_{52} = -0.016(0.297)$	0.958	-0.603—0.571
$M_2W_3$ : Inno. Act * Family-Owned	$b_{53} = 0.852(0.877)$	0.332	-0.878—2.582
$M_2W_4$ : Inno. Act * Affiliate	$b_{54} = 0.508(0.835)$	0.544	-1.140—2.155
$M_2W_5$ : Inno. Act * Privately Listed	$b_{55} = -1.340(2.210)$	0.539	-5.721— 3.003
$M_1$ : Financial Requirement	$b_1 = -0.172(0.000)$	0.000	-0.263— -0.084
$M_2$ : Innovation-Activity Level	$b_2 = -0.364(0.416)$	0.416	-1.245—0.417
$R^2 = 0.396$			

Source: Test results from Process Macro

#### 4.3.1 Assessment of the Differences among Ownership Types using Kruskal Wallis Test

The Kruskal Wallis test results in differences among the levels. The null hypothesis fails to hold as there are no statistically significant performance differences between ownership levels ( $p = 0.368$ ). The insignificance implies the absence of any rationale for further probing. The findings support the zero effect size discussed above.

**Table 4. 11 Kruskal Wallis Test Results on Ownership Levels**

Null Hypothesis	Sign	Decision
The distribution of performance is not definitively different from zero across ownership levels	0.368	Retain the Null Hypothesis

Source: Test results from SPSS

Interchanging terms result in the following best-fitting OLS equations:

- The indirect effects (assuming family ownership):
 
$$= [-0.172(0.439 + 0.115)] + [-0.364(-0.014 + 0.063)]$$

$$+ [-0.364(0.439 + 0.115)\{0.009 + (0.235 + 0.852)family - owned\}]$$

$$= -0.242 - 0.177family\ owned$$

- BIC and BE's direct effect:

$$= 0.179BIC + 0.419BE$$

### 4.3.2 The Relationship between Ownership Type, the Firm Age, and the Predictor's Indirect Effect on Performance.

Regarding the first mediator, the pathway ( $\theta_{X_2 \rightarrow M}$ ), all five ownership levels have a low demand for external financial requirements than the referent group. With the second mediator, path ( $\theta_{X_2 \rightarrow M}$ ), only two ownership levels have a more substantial influence on the innovation-activity level than the referent group, namely, family and privately listed. Their influence is definitively different from zero based on the percentile bootstrap CI.

### 4.3.3 The predictors' Effect Size on Performance Conditional on Ownership Type (First-Stage Moderation)

Based on the findings, ownership type interaction with BIC positively affects performance for three categories, namely male-owned, female-owned, and affiliates. Whereas for BE, these are male-owned, affiliates, and privately listed.

**Table 4. 12 Test Results for First-Stage Moderation**

Ownership ( $W$ )	BIC ( $X_1$ )			BE ( $X_2$ )		
	Effect	$SE_{boot}$	95% Perc. CI	Effect	$SE_{boot}$	95% Perc. CI
Entrepreneurs	.097	.134	(-.167)— 0.362	(-.173)	.126	(-.421)— .075

Male	<b>.645</b>	.155	.339— 0.951	<b>.410</b>	.187	.040— .779
Female	<b>.938</b>	.209	.526— 1.350	.525	.461	(-.385)—1.434
Family	.682	.711	(-.72)—2.084	.630	.883	(-1.113)—2.373
Affiliate	<b>1.661</b>	.068	(1.526)—1.795	<b>(-2.659)</b>	.236	(-3.126)— (-2.193)
Privately Listed	(-.653)	.362	(-1.367)—0.062	<b>(-.802)</b>	.251	(-1.296)— (-.307)

Source: Test results from Process Macro

#### 4.3.4 The Mediators' Effect on Performance Conditional on Firm Age (Second-Stage Moderation)

Based on the findings, external financial requirement's interaction with age hurts start-ups & young firms' performance ( $-0.297, Se = 0.047$ ) and those growing ( $-0.172, Se = 0.035$ ). Furthermore, it negatively influences the correlation between innovation activities and performance for the two groups. That is, start-ups & young ventures ( $-1.985, Se = 0.581$ ) and growing ( $-1.118, Se = 0.362$ ). The effects are substantially different from zero based on the percentile CI. These factors and their interactions result in a 38.8% change for external FR and 33.6% for innovation activities. Notably, they result in a significant difference in the outcome variable, 62.7% for performance. Appendix (2) in the main document.

**Table 4. 13 Test Results for the Second-Stage Moderation**

Age ( <i>Z</i> )	Financial Req. ( $M_1$ )			Innovation Act ( $M_2$ )		
	Effect Size	$SE_{boot}$	95% Perc. CI	Effect Size	$SE_{boot}$	95% Perc. CI
Low	<b>-0.297</b>	.047	-0.390— -0.204	<b>-1.985</b>	0.581	-3.131— -0.839
Medium	<b>-0.172</b>	.035	-0.240— -0.103	<b>-1.118</b>	0.362	-1.833— -0.403
High	-0.046	.042	-0.129— 0.037	-0.251	0.294	-0.831— 0.328

Source: Test results from Process Macro

\*Low = 16<sup>th</sup> percentile (startups/young—under five years); Medium = 50<sup>th</sup> percentile (growing—over five but under ten years) and; High = 84<sup>th</sup> percentile (mature—over ten years)

#### 4.3.5 Testing BIC and BE's Direct and Indirect Effects Size Conditional on Ownership Type and Firm Age

Based on Appendix (4) findings, the two moderators robustly influence BIC's indirect effect (via external FR) on performance for three ownership types. The conditional indirect impact is statistically significant for affiliates, male and female-owned firms in the startup/young and growing life-cycle phases. Bank-imposed requirements indirect conditional effects hurt the performance of these firms. On the converse, BIC has a significant indirect conditional effect (via IAL) on the performance of affiliates and privately listed firms again at the two stages. Such indirect conditional effect negatively influences performance substantially based on the percentile CI.

The moderators' influence of BE's indirect effect (via external FR) results in a substantial positive performance for affiliates and privately listed firms but negatively for male-owned. However, such conditional effects via IAL hurts male-owned, entrepreneurs-owned, and privately listed firms. The adverse impact is robust at the two firm life cycle stages based on the CI.

Appendix (3) focuses on the dual moderation of BIC and BE's direct effect on performance. Regarding BIC, such double moderation results in family-owned and affiliate firms' positive performances at all three age levels but hurts privately listed. The effects are definitively different from zero as there is no zero in the percentile CI. Likewise, BE has a statistically significant indirect effect on all ages for half of the ownership types. Such conditional effect positively influences entrepreneurs' and family-owned venture performance but adversely affects privately listed firms. Nevertheless, it is essential to explore if any significant variances exist among surveyed firms based on age.

#### 4.3.6 Assessment of the Differences among Age Groups using the Kruskal-Wallis Test

The mean difference between the groups is statistically different from zero ( $p = 0.002$ ). The substantial difference in the means requires additional tests, thus, the pairwise comparison of the differences in means. There are discernible differences in the means of these age groups. In particular, the mean of the 'over two years but under five' substantially differs from the 'under two years' group ( $p = 0.002$ ). Likewise, such a difference exists between the 'over five years but under ten' and the 'under two years' ( $p = 0.0038$ ).

**Table 4. 14 Kruskal Wallis Test Results on Age Groups**

Null Hypothesis	Sign	Decision
The distribution of performance is the same across age groups	<b>0.002</b>	Reject the Null Hypothesis

**Table 4. 15 Pairwise Comparison for Means**

Age Group Levels	Standard Test Statistic	Adjusted Significance
Over 2 years but under 5 vs Under 2 years	3.615	<b>0.002</b>
Over 5 years but under 10 vs Under 2 years	2.734	<b>0.038</b>

Source: Test results from SPSS

Replacing the terms gives the best-fitting OLS equations. The equations consider an affiliate in the 'over ten years' category, selected randomly (compared to the referent).

1. The indirect effect (for instance, via external FR) of BIC and BE on the performance

$$\begin{aligned}
 &= (0.098 + 0.890 + 1.563Affiliate)(-1.04 + 0.381Agegroup) \\
 &= (0.988 + 1.563Affiliate)(-1.04 + 0.381Agegroup)
 \end{aligned}$$

2. BICs and BE direct impact conditional on ownership type and age group

$$\begin{aligned} &= [(0.196 + 0.639) + (0.708 - 1.6)Affiliate] + [-1.06 + (-0.583 - 0.278)Age\ group] \\ &= (0.835 - 0.892Affiliate)(-1.06 - 0.305Age\ group) \end{aligned}$$

## CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

The study sought to explore the bank-imposed condition and the business environment's direct and indirect effect on firm performance. The external financial requirements and innovation-activity level offer the indirect pathway. Still, the researcher examined the predictors' direct and indirect effects on performance conditional on the owner-manager perception of future finance availability, ownership type, and firm age. The study presents two sets of descriptive statistics: raw data and mean-centered. Mean-centering is a critical component of structural equation modeling and conditional path analysis based on existing literature.

Nonetheless, ownership type and firm age are not mean-centered as they are categorical variables. While some scholars argue that a categorical variable is a continuous factor with more than five levels, others hold a conservative view. The researcher opted for the conservative approach treating ownership type (with six levels) as a categorical moderator. Preliminary findings reveal no substantial performance differences among sampled firms based on ownership type. On the converse, the opposite is true for firm age. R statistical program and Process Macro tested the significance of the predictors' direct, indirect, and conditional effects on the outcome variable.

Bank-imposed conditions and the business environment have a robust, positive, and direct influence on performance. In such a situation, bank conditions act as a deterrent to financial indiscipline among firms granted formal credit facilities. Similarly, BICs, viewed as a measure of formal financial access, enhance funding requirements. Higher unfulfilled financial needs negatively impact performance. Also, superior performance occurs when firms exploit opportunities in the prevailing business environment by being proactive rather than passive or reactive. Firms can introduce or alter their innovation activities as a competitive strategy regardless of the existing business environment.

Moreover, findings establish a negative correlation between innovation activities and performance, albeit inconsequential. The two predictors have a substantial indirect effect on performance. In particular, external finance requirements and innovation activities mediate about 20% of BE and BIC's adverse indirect effects on performance. That notwithstanding, owner-manager perception of future finance availability's interaction with the prevailing business environment significantly lowers external finance requirements while hurting innovation activities on the other hand.

Furthermore, ownership type alone has no meaningful influence on predictors. It has little effect on firm requirements for external cash or innovation activities. Nonetheless, consistent with existing empirical literature, firm age relates strongly to innovation activities and performance. Still, ownership type and firm age robustly moderate BE and BIC's indirect effect on performance. The analysis illustrates how ownership type combination with different firm age levels influences the predictors' impact on performance.

Be as it may, loan pricing and associated costs allowed boosted credit flow to SMEs than non-pricing conditions like collaterals, facility size, and maturity. Owner-manager perception of future finance uncertainties makes the firms place their faith in internally generated revenues. Besides, domestic firms introduce more service innovations than any of the other categories. These firms invest more in in-house R&D, internal innovation-related training of the workforce, software acquisition, and equipment to boost innovativeness. However, those that shunned innovativeness were primarily due to uncertainty about innovation acceptability by the market, low innovation demands, and great ideas' unavailability.

Numerous enterprises scaled down their operations or closed shop altogether due to the Covid pandemic. Most formal financial institutions agreed to restructure loan facilities for firms advanced credit. However, with the unfavorable pandemic effects expected to take time before clearing, accessing formal credit may pose a challenge for specific firms. Due to this, traditional credit providers are introducing additional (revising their lending) conditions to lower cases of non-performing loans.

Firms with insufficient collateral or guarantee and unable to access formal credit may opt for informal financing. All these may have a substantial effect on local firms' financing and business survival. It is expected that government will be keenly monitoring the situation and act accordingly. For instance, the government has been reviewing the listing of defaulting SMEs at credit reference bureaus. The move is meant to stop the blacklisting of enterprises from accessing loans as the economy recovers.

Access to formal credit by domestic firms substantially is a major pillar of this study. Also, such accessibility has a direct influence on Kenya's economy. While the MPC rests the monetary policy based on economic conditions, the Central bank must pursue other options to enable banks to advance deserving SMEs' credit. The findings show that bank conditions have a substantial effect on the SMEs' access to formal credit and ultimately, performance. As such



the Central bank must pursue a monetary policy (MP) that addresses credit availability, whether pursuing a contractionary or expansionary policy.

In the Kenyan case, the Central bank should continuously engage commercial banks to channel funds to SMEs. For banks willing to lend to risky ventures, the CBK should offer them incentives like lower interest rates and collateral than other compliant banks. The study came at an unprecedented time, the Covid pandemic, which has adversely affected most economies across the globe. Could the situation offer the country a perfect opportunity to test the unconventional monetary policy? It combines discount lending, open market operations (OMO), and quantitative easing (QE).

The government through different agencies continuously makes efforts to avail significant funds to the youth, the women, and the less privileged in the economy. These funds are meant to either start or expand existing businesses. These as stated earlier include the Youth fund, Uwezo fund among others. Unfortunately, the success rate of these ventures is low and so is the repayment rate. Several reasons are attributed to the failure such as amounts advanced. Whatever the case, policymakers need to reexamine whether the program meets its intended purpose. The researcher opines that these funds through the CBK, be channeled to commercial or state-owned banks for SMEs lending at rates lower than market rates.

In conclusion, incidences like Covid-19 have a substantial impact on emerging economies like Kenya. Domestic businesses will experience such effects for a considerable length of time. The government's involvement in the domestic financial market through borrowing has crowded out credit to the private sector. Small to medium enterprises with insufficient collateral resources are hardest hit by such government action. The study avers that limited government involvement in domestic borrowing coupled with other remedies highlighted above may result in favorable credit flow to businesses.

## **5.2 Recommendation**

Domestic small and medium enterprises should maintain a positive relationship with their bankers over the business life cycle. Research suggests that enterprises have positive benefits when they keep trust with their bankers. For instance, these firms may get substantial financial and professional assistance from their bankers should profitable opportunities arise. Besides, through relationship banking, firms may be subjected to friendlier customized requirements that boost the chances of accessing sought funds.

The business environment is continuously changing so are the effects on firms in different economic sectors. Whereas such turbulence may pose challenges to passive or reactive firms, it offers business opportunities for proactive businesses. Today, technology is the new world order; business processes and products unique yesterday may be obsolete tomorrow, regardless of firm size. Thus firms must remain positive by concentrating on one or a combination of the four innovation types: product, process, organizational, and marketing. Enterprises must be conscious of their age or business life cycle phase. The study's results concur with existing literature that firm age is an essential determinant of innovation, performance, and other processes, like business survival, capital accumulation, & owner-manager perceptions.

Whereas bank-imposed conditions and the business environment have a desirable direct effect on performance, their indirect effect hurts such an outcome. Also, unmet external financial needs substantially hurt performance—addressed by an excellent firm-bank relationship. The owner-manager must take control over their perceptions of future finance availability. Such perceptions regarding bank requirements make a terrible situation (external financial needs) worse. Likewise, perception concerning the prevailing business environment may force them to lower external funding requirements. Sadly, such a revision, while realistic, curtails full exploitation of the innovation-type niche strategy. Ownership type and firm age should inform crucial decisions relating to bank financing, external funding needs, and the adopted plan for prevailing business conditions like innovation.

The government through relevant agencies must develop a (carrot and stick) framework that punishes non-compliant but rewards compliant banks. Kenya, being a free economy, CBK should allow commercial banks flexibility in loan pricing. That is, act tough on banks that may seek CBK's assistance like a loan through higher interest rates and collateral requirements and vice versa. However, caution should be exercised on the issue of non-performing loans (NPLs) with the Central Bank 'walking through them' with concerned banks. Besides, CBK should interrogate thorough each commercial bank's business model (and offer guidance on a case-by-case basis).

### **NEW SCIENTIFIC FINDINGS**

Based on the analysis and discussion in the previous chapters, the researcher draws the following new findings:

1. Bank imposed conditions and the business environment have a substantial direct effect on performance. However, their effect becomes negative (inverse correlation) when considering a firm's external financial need particularly for young/startups and growing firms.
2. Bank-imposed conditions tend to increase (worsen) the need for external funding, especially for firms unable to meet the set terms. Besides, the prevailing business environment influences innovation activities amongst firms. That is, a competitive business atmosphere nudges firms to find strategies for surviving like being innovative.
3. Owner-manager perception of finance availability positively influences the correlation between bank imposed conditions and the financial requirements of an enterprise. On the converse, OMP results in an inverse relationship between the business environment and innovation activities.
4. Firm Ownership type affects bank imposed conditions and the business environment's direct and indirect effect on performance. The argument holds for single-owned firms (both male and female-owned), affiliates, and privately listed. Nonetheless, the nature of the effect depends on the ownership considered.

## SUMMARY

The researcher formulated four objectives and related hypotheses to guide the present study. In particular, the study investigates bank-imposed conditions and the business environment's three different effects on firm performance. These are the direct, indirect, and conditional effects, particularly on small and medium-sized firms in Kenya over three years. The indirect effect is through two factors, namely external finance requirements and innovation activity level. Still, BE and BIC's indirect and conditional effects stem from three moderators: ownership type, firm age, and owner-manager perception of future finance availability. Structural equation modeling through the R program and Process Macro Pathway Analysis tests the study's hypotheses.

Objective one hypothesized that BIC and the BE's direct and mediated effects on the firm performance are definitively different from zero. The hypothesis assumes a serial arrangement of the mediator with external financial requirements influencing innovation activities. The study tests the theory by exploring the significance of the product of the coefficients test. From the findings, BICs and BE have a positive and substantial direct effect on performance. Moreover, based on the path analysis, the product of the coefficients is statistically significant. Unlike the direct impact, the predictors' indirect effect negatively correlates with performance. More precisely, the mediators account for approximately 20% of BE and BIC's negative influence on performance. Thus, the test results confirmed the first hypothesis.

Objective two hypothesized that the moderating effect of owner-manager perception of future finance availability on the BE and BIC's effect is robustly different from zero. The index of moderated mediation tests the hypothesis assumptions. Owner-manager perception interaction with the business environment significantly lowers external financial needs but with undesirable effects on innovation activities. Also, these perceptions have no meaningful impact on firm performance. However, the index of the moderated mediation test result is statistically insignificant. Therefore, the findings do not support the second hypothesis; owner-manager perception of future financing is inconsequential in the entire model.

Objective three assumes that ownership type substantially influences BIC and BE's indirect effect on performance. Like in the first model, the mediators are in a serial

format. With ownership type acting as a categorical variable, dummy coding resulted in five rather than six categories. Specifically, the 'entrepreneurs owned' category served as the referent group. The selection was arbitrary, at the researcher's discretion, and not based on any empirical support. External financial requirement weakly influences innovation activities. Besides, there are no robust differences in performance based on firm ownership. Neither does ownership influence external financial requirements or innovation activities. That notwithstanding, bootstrapped indirect effects indicate that ownership type has no substantial influence envisioned in the hypothesis.

Objective four assumed that BIC and BE's effect on performance conditional on ownership level and firm age is not statistically different from zero. The hypothesis resulted in a moderated-moderated mediation model, two models in one. The first stage model places ownership type between the predictors and the mediators. In the second-stage model, firm age is between the mediators and performance. Like ownership type, firm age is a categorical variable that resulted in dummy coding. That is, the referent group comprises firms in the above five but less than ten years category.

Also, ownership and firm age dually moderate the predictors' direct path. Significant differences exist in performance based on firm age, as evidenced by the Kruskal Wallis test. The absence of a detailed index of moderated-moderated mediation in models with categorical variables necessitates probing the conditional effects before concluding the significance status. Nevertheless, ownership type and firm age substantially condition BE and BIC's direct and indirect impact on the outcome variable based on the findings. Thus, the fourth and final hypothesis is confirmed.

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1. Mallinguh, E. & Zoltan, Z (2022). Financial Institution Type and Firm-Related Attributes as Determinants of Loan Amounts. *Journal of Risk and Financial Management*, 15 (3),119. <https://doi.org/10.3390/jrfm15030119>
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### CONFERENCE PRESENTATION

1. "Innovative Financial Digital Ecosystem: An Evaluative Study of Kenya." MIRDEC 6<sup>th</sup> International academic conference on economics, business and social science, 2017, Lisbon, Portugal
2. "Literature Review and Classification: Monetary Policy and Equity Market Volatility." International Business Information Management Association (IBIMA) 31<sup>st</sup> conference, 2018, in Milan Italy
3. "Economic Policy and Private Credit in Kenya." 25<sup>th</sup> Anniversary of the Doctoral School of Management and Business Administration, 2019 at Szent István University