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**DRIVERS OF CREDIT ACCESS AMONG WOMEN OWNED  
MANUFACTURING SMALL AND MEDIUM ENTERPRISES IN KENYA**

**SNIDER MUGESE ODANGA**

**MDF/170383/2023**

**A DISSERTATION SUBMITTED TO STRATHMORE BUSINESS SCHOOL IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF  
THE DEGREE OF MASTER OF SCIENCE IN DEVELOPMENT FINANCE OF  
STRATHMORE UNIVERSITY**



**JUNE 2026**

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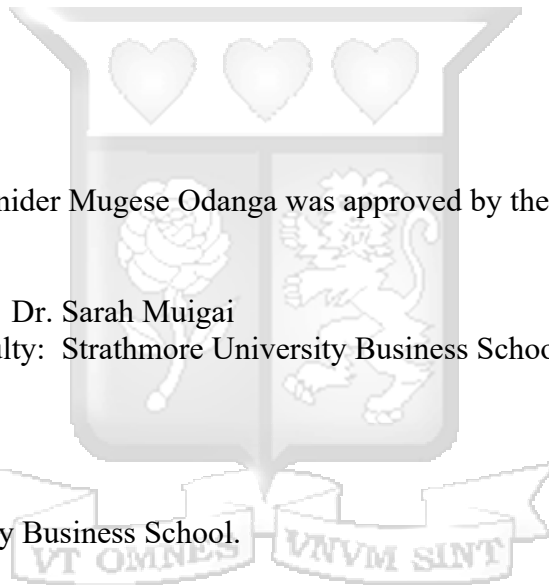
Approval

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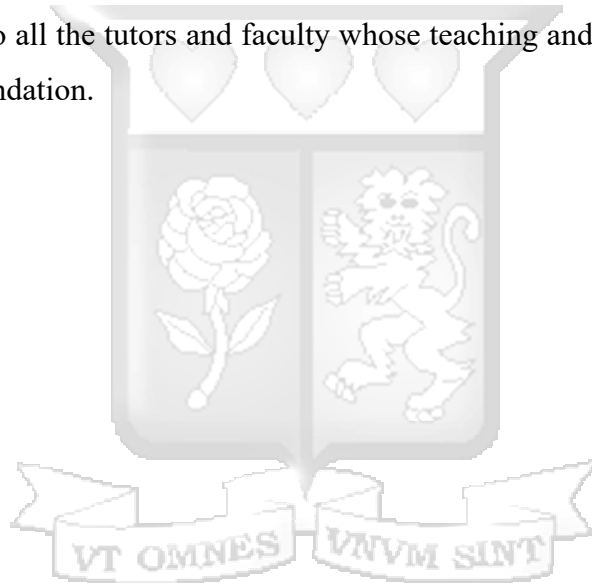
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## ABSTRACT

Access to formal credit remains a persistent constraint for women-owned small and medium-sized enterprises (SMEs), particularly within capital-intensive sectors such as manufacturing. Despite progress in financial inclusion in Kenya, significant gender disparities continue to characterize enterprise-level financing. This study examined the drivers of credit access among women-owned manufacturing SMEs in Kenya, with specific focus on credit perception and collateral availability, and further assessed the moderating role of firm size using a sample of 161 firms. Anchored in the Theory of Planned Behavior and Information Asymmetry Theory, the study conceptualized credit access as jointly shaped by behavioral (demand-side) and structural (supply-side) factors. Using secondary firm-level data from the World Bank Enterprise Survey and applying binary logistic regression, the study analyzed how credit perception, collateral availability, and firm size influence the likelihood of accessing formal credit. The findings indicate that unfavorable credit perceptions significantly reduce the probability of accessing credit, confirming the presence of discouraged borrowing behavior among women entrepreneurs. Collateral availability emerged as the most dominant structural determinant, reflecting the continued reliance on asset-based lending practices in Kenya's financial system. Importantly, firm size was found to moderate both relationships: as firm size increases, the negative effect of credit perception weakens, while the marginal importance of collateral diminishes. These results demonstrate that credit exclusion among women-owned manufacturing SMEs is not solely a function of credit supply constraints but is also shaped by perception-driven self-exclusion and firm heterogeneity. The study contributes to the literature by integrating behavioral and structural perspectives within a gendered and sector-specific context. Policy implications include the need for perception-sensitive lending frameworks, alternative collateral mechanisms, and size-segmented SME finance strategies. By highlighting the interaction between behavioral constraints and structural barriers, the study provides evidence-based insights to inform more inclusive financial policies aimed at strengthening women's participation in Kenya's manufacturing sector.

**Key Words:** Women owned manufacturing SMEs, credit perception, collateral availability, firm size and credit access.

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## ABBREVIATIONS AND ACRONYMS

|                 |                                                                                 |
|-----------------|---------------------------------------------------------------------------------|
| <b>BEEPS</b>    | Business Environment and Enterprise Performance Survey                          |
| <b>CBK</b>      | Central Bank of Kenya                                                           |
| <b>COVID-19</b> | Coronavirus Disease 2019                                                        |
| <b>ECOWAS</b>   | Economic Community of West African States                                       |
| <b>FSD</b>      | Financial Sector Deepening                                                      |
| <b>GDP</b>      | Gross Domestic Product                                                          |
| <b>GPFI</b>     | Global Partnership for Financial Inclusion                                      |
| <b>IFC</b>      | International Finance Corporation                                               |
| <b>IMF</b>      | International Monetary Fund                                                     |
| <b>KAM</b>      | Kenya Association of Manufacturers                                              |
| <b>KAM-ICRW</b> | Kenya Association of Manufacturers – International Center for Research on Women |
| <b>KBA</b>      | Kenya Bankers Association                                                       |
| <b>KES</b>      | Kenyan Shilling                                                                 |
| <b>KIPPRA</b>   | Kenya Institute for Public Policy Research and Analysis                         |
| <b>KNBS</b>     | Kenya National Bureau of Statistics                                             |
| <b>KWFT</b>     | Kenya Women Finance Trust                                                       |
| <b>MSME</b>     | Micro, Small, and Medium Enterprises                                            |
| <b>WBES</b>     | World Bank Enterprise Survey                                                    |



## DEFINITION OF TERMS

**Credit Perception:** Refers to an entrepreneur's subjective assessment of the likelihood of obtaining credit and the extent to which access to finance is perceived as an obstacle. It reflects beliefs regarding loan affordability, collateral requirements, interest rates, fees, application procedures, and the probability of approval (Dutta & Mallick, 2022; Simba et al., 2024).

**Credit access:** Refers to the ability of a firm to obtain formal financing from a financial institution (Naegels et al., 2018)

**Collateral availability:** Refers to the assets that a firm can pledge as security when applying for a loan. It reflects the extent to which a business possesses assets that satisfy lenders' collateral requirements and signal creditworthiness (Rahman et al., 2017; Simba et al., 2024; Beck & Demirgüç-Kunt, 2006).

**Firm size:** refers to the scale of a business measured by the number of permanent full-time employees. Consistent with the Kenya National Bureau of Statistics (KNBS) and World Bank Enterprise Survey classifications, firm size is used in this study as a moderating variable influencing the relationship between credit perception, collateral availability, and credit access (KNBS, 2016; Simba et al., 2024)

**Discouraged borrower:** Refers to an entrepreneur who requires credit but chooses not to apply because of anticipated rejection, perceived discrimination, complex procedures, or unfavorable lending conditions (Morsy et al., 2019).

**SME:** Refers to a business enterprise classified according to its number of employees and operational scale. In Kenya, SMEs generally comprise firms with between 5 and 99 employees, with small enterprises employing 5–19 workers and medium enterprises employing 20–99 workers (KNBS, 2016).

**Women-owned small or medium enterprise:** Refers to a business in which women hold the majority ownership interest and exercise significant managerial control over business operations and decision-making (IFC, 2023; Galli et al., 2020).

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background to the Study**

Small and medium-sized enterprises (SMEs) are recognized widely as key drivers of job creation and economic growth globally, playing a critical role in both developed and developing countries (Fajarika et al., 2024). However, despite their vital contribution to economic development, SMEs often struggle to grow due to limited access to finance (Ardic et al., 2012; Beck & Demirguc-Kunt, 2006; Ng'ang'a 2015; Rao et al., 2023; Tiriongo et al., 2025). According to International Finance Corporation (IFC) (2023), Micro, Small and Medium Enterprises report (MSME) finance gap report, South Asia has the largest proportion of fully constrained enterprises at 28%, followed by Sub-Saharan Africa at 25% of fully constrained MSMEs. Numerous studies have investigated the barriers to accessing finance by SMEs from different perspectives, including firm size, managerial experience, formal registration, financial literacy and found that the situation is especially consequential for women-owned SMEs (Marlow & Carter 2004; Beck & Demirguc-Kunt, 2006; Financial Sector Deepening (FSD) Kenya, 2022). Accessing formal credit remains a persistent challenge, constraining their capacity for growth and innovation (Naegels et al., 2018; Galli et al., 2020). While they face certain constraints like their male counterparts, there are many obstacles they face solely because of their gender (Singh & Dash 2021).

Globally, women-led businesses face a credit gap of approximately USD 1.5 trillion, with Sub-Saharan Africa representing a significant portion of this unmet demand (International Finance Corporation (IFC), 2023). While women constitute nearly 50% of SMEs in the region, they receive only 30% of the required credit, a disparity driven not only by discriminatory lending practices but also by behavioral dynamics such as self-exclusion due to anticipated rejection (Galli et al., 2020). Kenya has made notable strides in reducing the gender gap in access to financial services over the past two decades, yet significant disparities remain in enterprise-level financing. According to the Kenya FinAccess Report, the overall gender gap in formal financial inclusion, measured by the difference between men's and women's access to formal financial services narrowed sharply from 12.7% in 2006 to 1.6% in 2024 (Central Bank of Kenya et al., 2024). This was largely due to mobile money adoption, digital banking innovations, and gender-inclusive financial policies (FSD

Kenya, 2024). Similarly, a gender data diagnostic by Data2X found that Kenya's financial access gap fell from 12% in 2006 to 5.4% in 2019, indicating substantial progress in women's participation in the formal financial system (Data2X, 2019). Additionally, Data2X (2019) report estimated that only 9% of women-led SMEs in Kenya access formal credit, compared to 14% of male-led counterparts. Further, women entrepreneurs face higher rejection rates at 17% and are more likely to rely on informal financing mechanisms, such as chamas and family loans, with 43% reporting these as their primary sources of funding (FSD Kenya 2024).

Despite these gains in basic financial inclusion, gender disparities persist in access to formal credit for women entrepreneurs, particularly among micro, small, and medium enterprises (MSMEs). Women-owned MSMEs account for approximately one-third of all registered small businesses in Kenya, yet only 7% have formal access to finance, reflecting persistent structural barriers to financial inclusion (International Finance Corporation [IFC], 2024, para. 1). These findings confirm that while Kenya has nearly closed the overall financial inclusion gap, the credit gap for women-owned businesses remains substantial.

Extant literature identifies a wide array of factors influencing access to credit for SMEs, typically categorized into demand-side behavioral factors, supply-side factors and structural barriers. Demand-side behavioral factors relate to the entrepreneur's perceptions, attitudes, and willingness to seek credit, including elements such as risk perception and discouragement from applying (Galli et al., 2020). Supply-side factors refer to lender-driven constraints such as risk assessment practices, interest rates, and collateral requirements (Beck et al., 2006) while structural factors capture firm-level characteristics including size, age, and formalization, which influence both lender decisions and borrower behavior (Mwirigi et al., 2021). In Kenya, demand side behavioral factors that explain why women engage differently in credit markets have remained underexplored. This study will fill this gap by focusing on credit perception and collateral availability as factors that directly shape credit seeking behavior. Collateral availability is a critical factor that influences both real and perceived credit access constraints (Simba et al., 2024). Additionally, it will test whether firm size moderates the relationship between credit perception and credit access. By focusing on this interaction, it aims to clarify whether

growth in firm size translates into improved credit access for women entrepreneurs or whether behavioral constraints persist regardless of firm size.

### **1.1.1 Credit Access for Women-owned Firms**

Gender disparities in access to credit persist globally, with women-owned enterprises disproportionately affected despite often demonstrating similar or better performance than male-led counterparts (Morazzoni & Sy, 2022). For instance, Brush et al. (2018) found that male-led startups in the United States were four times more likely to secure venture funding than female-led ones, even when controlling for business performance. These disparities are often rooted in both structural and behavioral constraints operating across both supply and demand sides of the credit market.

On the supply side, statistical discrimination, rooted in information asymmetries, results in lenders perceiving women-owned firms as riskier due to their smaller size, limited collateral, and informality (Marlow & Carter, 2004; Morazzoni & Sy, 2022). Lenders often rely on group-based heuristics to assess creditworthiness, penalizing female entrepreneurs regardless of individual merit. In parallel, taste-based discrimination, driven by unconscious bias or risk aversion, further restricts credit access. For example, Bellucci et al. (2010) found that female loan officers were more risk-averse, disproportionately limiting credit to newer or unproven borrowers. From the demand side, many women entrepreneurs self-exclude from formal credit channels due to perceived rejection or institutional complexity. Galli et al., (2020) characterize these women as “discouraged borrowers.” Studies show they often turn to internal sources such as friends, family, and savings due to anticipated discrimination or prohibitive collateral requirements (Dutta & Mallick, 2022; Naegels et al., 2018; Pavlova & Gvetadze, 2023).

Empirical studies reinforce the persistence of these barriers. Bellucci et al. (2010) observed that women-owned businesses in Italy faced higher collateral demands and interest rates than men. Singh and Dash (2021), through a systematic literature review, highlighted risk aversion among banks and lack of asset ownership as persistent barriers to credit access for women. Even when firm-level characteristics are controlled for, gender-based perceptions and stereotypes shape lending decisions (Cole et al., 2018). In Kenya, FSD Kenya (2022) reports that formal credit access remains skewed towards men and larger firms. Women-

owned businesses, often smaller and informal, rely on community-based sources like chamas due to collateral barriers and exclusion from formal networks (FSD Kenya, 2023). These dynamics highlight the critical need to examine not just structural limitations but also behavioral factors like credit perception which was addressed by the current study. For this study, credit access was measured using 2018 World Bank Enterprise Survey (WBES) data, indicated by an SME applied for a loan or not and the outcome of the application to distinguish self-exclusion and actual rejection (Galli et al., 2020; Simba et al., 2024).

### **1.1.2 Credit Perception**

Perception serves as the fundamental means through which humans cognitively engage with their surrounding environment (Efron 1969). In finance, credit perception is defined as an individual's subjective evaluation of the likelihood of obtaining a loan or being rejected by a financial institution (Simba et al., 2024; Dutta & Mallick 2022). It encapsulates beliefs about one's creditworthiness, trust in lending institutions, and perceived barriers to formal finance (Naegels et al., 2018) For women-owned firms, these perceptions are shaped by past experiences, cultural expectations, and systemic biases, often resulting in self-exclusion from formal credit channels (Morsy et al., 2019).

Simba et al., (2024) measured credit perception as the magnitude of the perceived constraints in access to credit and found that gender and collateral significantly affect credit perception, while Ključnikov et al., (2025) operationalized Theory of Planned Behavior in the context of borrowing and found that perceived behavioral control significantly and positively affected credit access. For this study, credit perception was captured by how women-owned firms perceive the obstacles to credit access. It is a subjective evaluation of the magnitude of constraints in credit access. Drawing from the WBES firm-level data, firms indicate whether they perceive access to finance which includes availability, cost, interest rates, fees and collateral requirements as an obstacle to their operations. Both Dutta and Mallick (2022) and Simba et al. (2024) employed similar indicators in examining how perceived credit constraints differ by gender composition and ownership in India and Africa, respectively.

This concept is critical because even when financing is available, negative perceptions may cause potential borrowers to self-exclude, resulting in a behavioral barrier to credit access (Morsy et al 2019; Naegels et al., 2018). This distorted perception may discourage women from accessing credit and limits their business growth opportunities hence important to study at country level. Firm size is introduced as a moderating variable in this study, as it is expected to influence the strength of the relationship between credit perception and access outcome. Larger firms may be better equipped to overcome perceived constraints due to their resources, reputation, and bargaining power (Beck et al., 2006).

### **1.1.3 Collateral Availability**

Collateral availability refers to the tangible or intangible assets a firm can pledge to secure a loan. It is a core principle of prudent banking practice and is used globally as a risk mitigation tool (World Bank, 2020). In most developing countries, including Kenya, land, buildings, and equipment are commonly required by financial institutions as collateral (Central Bank of Kenya (CBK) 2024). Collateral requirements are particularly significant for SMEs because most of these firms often lack transparent financial records, making them information-opaque to lenders. In such cases, collateral serves as a key signal of the borrower's creditworthiness, helping to mitigate perceived lending risk (Rahman et al., 2017). These requirements present a major challenge for women entrepreneurs, who typically have lower asset ownership due to legal, cultural, and economic barriers.

A large-scale survey by the Kenya Bankers Association (KBA), (2021) revealed that nearly half of MSMEs required collateral to secure credit due their size, with manufacturing firms many of them women-owned facing higher collateral demands than other sectors. Firm size, lack of valuable assets, and owners' gender majorly affects the ability of SMEs to convince lender to finance their businesses affecting their perception and consequently their confidence to apply for credit (Simba et al., 2024). To measure this variable, empirical studies consider whether collateral was required for a firm's most recent loan application, the percentage of fixed assets funded by internal funds or retained earnings and the approximate value of collateral required by the most recent loan (Rahman et al., 2017; Simba et al., 2024). In Kenya, Mwirigi et al., (2021) used the nature and value of collateral for their study on access to finance for women- owned SMEs in Nairobi. This

study will adopt indicators from the WBES where collateral availability was proxied using the proportion of fixed assets financed through internal funds or retained earnings. This indicator not only reflects asset ownership but also signals a firm's inability or reluctance to access external finance (Simba et al., 2024). SMEs with greater ownership of the business assets are more likely to secure external financing (Beck et al., 2006). This approach is consistent with a study done by Simba et al., (2024), whose study on the continent's manufacturing SMEs found that collateral has a significant effect on credit perception. Consequently, an increased ability to supply collateral may reduce borrower discouragement in credit application (Canton et al., 2013).

Although collateral availability is well established as a determinant of credit access, the literature has paid limited attention to the moderating factors that shape this relationship. This study therefore introduces firm size as a moderating variable to close this gap and strengthen the understanding of how collateral operates within heterogeneous firm contexts. Larger firms typically have deeper asset bases, formalized ownership structures, and stronger documentation, positioning them to meet collateral requirements more effectively and to be perceived by lenders as lower-risk borrowers (Canton et al., 2013). This often translates into reduced collateral demands or higher approval rates even where collateral is constrained. Conversely, smaller firms especially micro and small enterprises frequently possess collateral that is informally documented, undervalued, or deemed insufficient due to heightened perceptions of risk (Mwirigi et al., 2021). As such, firm size may either weaken or intensify the influence of collateral on credit access, underscoring the need to examine moderator variables to fully understand the mechanisms shaping financing outcomes for women-owned manufacturing SMEs.

#### **1.1.4 Firm Size**

Firm size is a critical characteristic influencing a business's access to finance, operational capacity, and sustainability (Tiriongo et al., 2025). Prior research has consistently shown that larger firms are generally perceived as lower risk by lenders, making them more likely to receive formal credit than smaller counterparts (Beck et al., 2006; Berger et al., 2007). In this study, firm size was assessed as a moderating variable, measured using the number of permanent full-time employees, consistent with both the Kenya National Bureau of

Statistics (KNBS, 2016) and WBES (2018) classifications. Specifically, small firms are defined as having 5–19 employees, medium firms' enterprises 20–99, and larger enterprises 100 or more employees. This indicator has been used in empirical finance and SME studies to categorize firm size (Berger et al., 2007; Simba et al., 2024; Dutta & Mallick, 2022; Hansen & Rand, 2014; Ng'anga 2015). Another indicator used for firm size is annual turnover thresholds (Tiriongo et al.,2025).

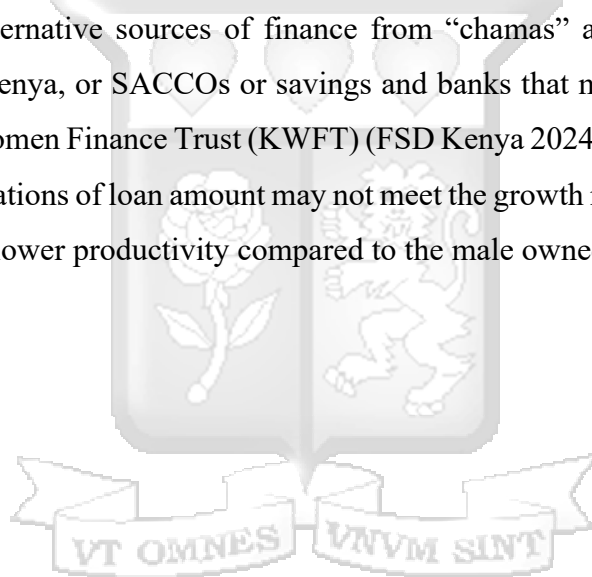
Firm size may moderate both structural and behavioral barriers to credit. For instance, while perceptions of credit constraints do not significantly differ across genders for small firms Hansen and Rand (2014) found that larger women-owned firms are more likely than male-owned ones to report access to credit as a major obstacle. This suggests that the gender gap in credit access may not match uniformly with firm growth. In Kenya, even medium-sized women-owned enterprises often remain reliant on informal financing channels and exhibit low credit uptake, pointing to persistent psychological and institutional barriers (Plan International & Intellectap, 2022).

#### **1.1.5 The Kenya SME Manufacturing Sector**

Kenya's manufacturing sector has a share about 7.3% to Gross Domestic Product (GDP) and creates the highest number of private sector employment serving as a key driver of economic growth through job creation and structural transformation (KNBS 2025). This sector is ranked the highest by contributing 24% of the MSMEs gross value added (KNBS 2016). Although not explicitly excluded from the sector, women- owned manufacturing SMEs are underrepresented in the sector with only about 153 of 1350 women led firms registered under the Kenya Association of Manufacturers (KAM) (Mugenyi et al., 2020). The Kenya Association of Manufacturers (KAM) has made deliberate strides to increase the participation of women in the manufacturing sector through the establishment of the Women in Manufacturing (WIM) program in 2017. Targeting women-owned, women-led, women founded micro, small and medium enterprises (MSMEs), WIM's goal is to create an enabling environment for women entrepreneurs in manufacturing. At the national level, the government has created gender sensitive action funds such as the Women Enterprise Fund (WEF), National Government Affirmative Action Fund, Youth enterprise Fund and Uwezo Fund (Kenya Bankers Association 2023). According to Mugenyi et al.,2020, in

the first ever women in Kenya manufacturing report, some women had their entry into manufacturing owing to these funds, while others expressed difficulty in access caused by sexual harassment, nepotism, corruption and opaque processes.

Women entrepreneurs in manufacturing face unique challenges that hinder their growth and sustainability. These include limited access to affordable finance and high operational costs (Mugenyi et al.,2020). Collateral requirements pose a significant barrier in access to finance for women-owned manufacturing SMEs due to cultural norms that restrict women's ownership of assets such as land (Brixiová et al., 2020). Additionally, women entrepreneurs frequently report encountering complex loan application procedures which further restricts their credit uptake (Naegels et al.,2018). It's because of these constraints that they seek alternative sources of finance from "chamas" a popular socio-economic welfare club in Kenya, or SACCOs or savings and banks that meet the needs for women like the Kenya Women Finance Trust (KWFT) (FSD Kenya 2024). These sources however, owing to the limitations of loan amount may not meet the growth needs of the firms keeping them small, with lower productivity compared to the male owned firms.



## 1.2 Statement of the Problem

Small businesses are widely recognized as the backbone of economic growth, yet up to 50% fail within the first five years, with even higher failure rates in developing economies (Denanyoh & Owusu, 2025). According to Denanyoh and Owusu (2025), the primary causes of small business failure are categorized into financial constraints, managerial deficiencies, market challenges, and environmental factors. Among these, limited access to finance emerges as a central and recurring barrier to firm survival and growth. Access to external finance plays a critical role in enabling SMEs to scale, innovate, and create jobs (Global Partnership for Financial Inclusion, 2023). Adequate financing allows firms to invest in equipment, hire talent, and expand their market reach, ultimately contributing to national productivity and economic resilience (International Finance Corporation, 2017). However, access to credit remains one of the most pressing constraints to SME growth and survival globally (Beck & Demirguc-Kunt, 2006; Quartey et al., 2017; Nguyen et al., 2022).

In Kenya, the challenge is even more pronounced, with approximately 70% of micro-enterprises lacking collateralisable assets, limiting them to informal finance, while larger, male-led firms often access more favorable lending terms (Kenya Bankers Association, 2024). For women-owned SMEs, these constraints are further compounded by gender-specific barriers. Despite increased attention to financial inclusion, women-led enterprises receive only 16% of SME loans in emerging markets, despite lower default rates (IFC, 2019), and account for only 2.3% of venture capital funding despite strong performance (GPFI, 2023). These disparities persist even where supply-side constraints have been addressed, suggesting the presence of deeper behavioral factors. Research shows that many women entrepreneurs self-exclude from formal credit markets due to perceived likelihood of rejection, particularly in environments viewed as opaque or biased (Galli et al., 2020; Statnik et al., 2023). Negative perceptions around loan conditions, institutional fairness, and application complexity can further discourage applications, even when firms are eligible (Naegels et al., 2018).

While most existing literature has focused on structural barriers such as collateral constraints and firm characteristics, limited attention has been given to psychological

factors such as credit perception. Collateral availability remains a key constraint, particularly for women who often lack ownership of high-value assets (Brixiova et al., 2020), yet little is known about how it interacts with perception to shape credit-seeking behavior (Rahman et al., 2017; Sakwa et al., 2019). Similarly, firm size which is often treated as a control variable, may influence both perceived and actual creditworthiness through its association with formalization and bargaining power (Gur et al., 2023). This gap is particularly relevant in Kenya, where existing studies have largely emphasized structural constraints with limited empirical focus on behavioral drivers. This study therefore examines credit perception and assesses whether firm size moderates the relationship between credit perception and access to finance among women-owned manufacturing SMEs, a capital-intensive sector with high financing needs.

### **1.3 Research Objectives**

The study was guided by the following general and specific objectives.

#### **1.3.1 General Objective**

The general objective of the study was to examine the drivers of credit access for women owned manufacturing SMEs in Kenya.

#### **1.3.2 Specific Objectives**

To address the general objective, the study was guided by the following specific objectives:

- (i) To examine the influence of credit perception on credit access among women-owned manufacturing SMEs in Kenya.
- (ii) To assess the influence of collateral availability on credit access among women-owned manufacturing SMEs in Kenya.
- (iii) To examine the moderating effect of firm size on the relationship between drivers of credit access and credit access among women-owned manufacturing SMEs in Kenya.

### **1.4 Research Questions**

The study answered the following questions:

- i) What is the influence of credit perception on credit access among women-owned manufacturing SMEs in Kenya?

- ii) What is the influence of collateral availability on credit access among women-owned manufacturing SMEs in Kenya?
- iii) What is the moderating effect of firm size on the relationship between drivers of credit access and credit access among women-owned manufacturing SMEs in Kenya?

### **1.5 Scope of the Study**

This study examined how credit perception and collateral availability influence access to credit among women-owned manufacturing small and medium-sized enterprises (SMEs) in Kenya. It further assessed whether firm size moderates the relationship between credit perception and credit access. The study used nationally representative firm-level data from the 2025 WBES for Kenya. This was the latest available dataset that captures credit application behavior, firm characteristics, and financing constraints. The unit of analysis was individual women-owned manufacturing firms. The study adopted a positivist research philosophy and applied a quantitative cross-sectional design. Credit access was measured as a binary outcome whether the firm accessed credit or not and the analysis was conducted using binary logistic regression.

### **1.6 Significance of the Study**

The empirical evidence of this study will be of significance to the following stakeholders.

#### **1.6.1 Women Entrepreneurs**

This study will offer actionable insights that can help these business owners understand the self-imposed barriers to secure financing, scale their operations, and formalize their enterprises.

#### **1.6.2 Policy Makers and Financial Institutions**

The study's findings can inform the design of gender-responsive lending products and guide the development of policies that lower barriers to finance for women, supporting broader economic empowerment and industrial growth goals.

### **1.6.3 Entrepreneur Support Organizations and Initiatives**

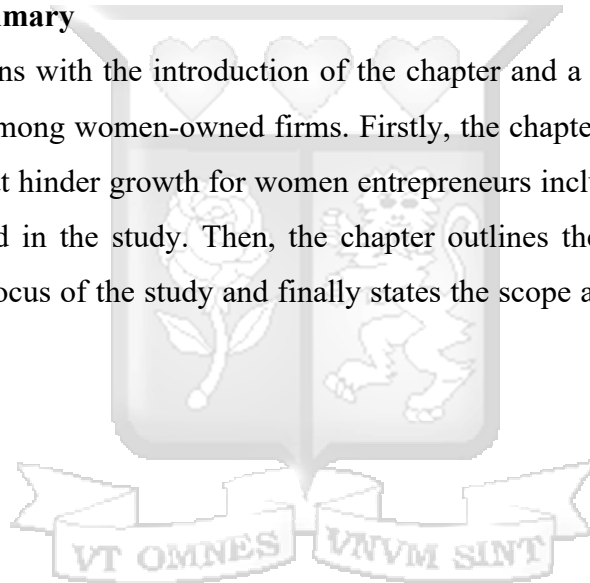
Programs like the Women in Manufacturing (WIM) initiative, business associations, and organizations working to promote gender equality in industry can use the evidence to refine their advocacy, training, and mentorship strategies, ensuring their interventions are better targeted and more effective.

### **1.6.4 Academicians and Researchers**

The study will add to the knowledge of gender equity in access to finance by providing insights that can serve as a foundation for future research thus contributing to a more inclusive and competitive manufacturing landscape in Kenya

### **1.7 Chapter Summary**

This chapter begins with the introduction of the chapter and a background on drivers of access to credit among women-owned firms. Firstly, the chapter presents an overview of the challenges that hinder growth for women entrepreneurs including access to credit and the variables used in the study. Then, the chapter outlines the research objectives and questions to the focus of the study and finally states the scope and the significance of the study.



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter focuses on the literature that relates to the research issues as posed by different academics and researchers worldwide. The review drew from a variety of sources that were relevant to the study's goal. The theoretical review is presented in the first section, followed by the empirical review.

### **2.2 Theoretical Review**

This study will examine the influence of credit perception and collateral availability on credit access by women-owned manufacturing firms in Kenya and the moderating role of firm size using the WBES data. Consequently, it was necessary to consider the theoretical explanations for credit seeking behavior by women owned SMEs using the Theory of Planned Behavior (TPB) and the Information Asymmetry.

#### **2.2.1 Theory of Planned Behavior**

The Theory of Planned Behavior (TPB), developed by Ajzen (1985; 1991; 2002) was applied in this study to explain the credit-seeking behavior of women-owned manufacturing SMEs in Nairobi. TPB posits that behavioral intention is shaped by three psychological constructs: attitude toward the behavior whether positive or negative evaluations, subjective norms, and perceived behavioral control which is the confidence in one's ability to perform the behavior. TPB evolved from the earlier Theory of Reasoned Action, which explained behavior as a function of behavioral intentions driven by attitudes and subjective norms. Ajzen (1991) extended this model by introducing perceived behavioral control, recognizing that individuals often face constraints that influence their ability to act on their intentions. Subsequent refinements included additional elements such as moral norms, habits, and past behavior to improve predictive power (Ajzen 2002). This theory has been widely applied in health, environmental behavior, consumer psychology and entrepreneurship (Kautonen et al., 2015). Despite its widespread use, critics have highlighted its limitations particularly its insufficient attention to structural or systemic inequalities, such as institutional gender bias or legal barriers, that may constrain behavior regardless of an individual's intention (Ogden, 2003; Sniehotta et al., 2014).

Ključnikov et al., (2025) operationalized TPB in the context of borrowing and found that perceived behavioral control significantly and positively affected credit access, while personal attitude showed no significant influence across countries in Europe. However, Zou and Fu (2024) using the same theory disputed that subjective norm while central to TPB did not affect behavioral intention. Applying this lens to women-owned manufacturing SMEs in Kenya, it is expected that perceived institutional barriers will influence attitudes and perceived behavioral control, resulting in discouraged borrowing behavior.

In this study, TPB was used to understand the extent to which credit perception shapes credit seeking behavior. A woman entrepreneur's intention to apply for credit may be shaped by her beliefs about her capacity to access financing and the anticipated outcome of applying. Negative past experiences limited financial literacy or fear of rejection may undermine perceived behavioral control and result in self-exclusion from the credit market (Naegels et al., 2018). Empirical studies support this view, showing that women often perceive higher complexity and lower chances of success in formal credit processes, deterring them from applying (Morsy et al., 2019; Dutta & Mallick 2022). Additionally, firm size and collateral availability can indirectly influence perceived behavioral control. Larger firms and those with sufficient collateral may perceive formal loan processes as accessible and worthwhile, resulting in stronger behavioral intentions to apply for credit (Canton et al., 2012). In contrast, smaller firms may perceive greater barriers, resulting in negative attitudes and reduced perceived control, ultimately discouraging credit applications (Simba et al., 2024). Thus, the application of TPB in this context will enable the nuanced exploration of psychological factors driving credit-seeking behavior among women entrepreneurs.

### **2.2.2 Information Asymmetry Theory**

This study was anchored in Information Asymmetry Theory, developed by Akerlof (1970) and later extended by Stiglitz and Weiss (1981) to explain credit rationing in markets characterized by unequal access to information between borrowers and lenders. Akerlof's seminal "market for lemons" model illustrated how one party's superior information about product quality can lead to market inefficiency. Stiglitz and Weiss (1981) applied this to

credit markets, showing that because lenders cannot perfectly assess borrower risk, they often demand high collateral or increase interest rates actions that may exclude otherwise creditworthy borrowers.

In the credit context, this imbalance of information results in adverse selection, where risk-averse lenders ration credit, and moral hazard, where borrowers' behavior changes after obtaining credit. Over time, the theory has evolved to incorporate behavioral responses borrowers, aware of such asymmetries and anticipating discrimination or rejection, may refrain from applying for loans altogether (Galli et al., 2020). This perspective is particularly relevant in explaining the credit behavior of women entrepreneurs, who often face both informational and perceptual barriers within formal financial systems. Empirical evidence consistently supports the relevance of information asymmetry in explaining credit access constraints. Beck and Demirgüç-Kunt (2006) found that the opacity of small and medium-sized enterprises (SMEs) significantly contributes to their limited access to finance, especially in environments with underdeveloped financial infrastructure. Similarly, Fatoki (2012) demonstrated that asymmetric information between entrepreneurs and lenders leads to high rejection rates and discourages women-owned SMEs from applying for loans in South Africa.

In Kenya, SMEs, which are typically smaller, less formalized, and undercapitalized. These firms often lack collateral, financial records, or established credit histories that would signal creditworthiness, reinforcing lenders' perception of high risk (CBK, 2024). This perceived risk may lead to credit rationing and discouragement, where women entrepreneurs self-exclude from the credit market due to low credit perception and anticipated bias (FSD Kenya, 2023; Galli et al., 2020).

Collateral availability plays a central role within this framework. Where collateral is scarce or undervalued as is common among women due to gendered asset ownership patterns it heightens lenders' uncertainty, increasing the likelihood of credit denial (Brixiová et al., 2020; Simba et al., 2024). Firm size was introduced in this study as a moderating variable, as it may mitigate information asymmetry. Larger firms typically provide more documentation, financial transparency, and operational history signals that reduce lender

uncertainty and improve credit access (Beck et al., 2006). Smaller women-owned firms, on the other hand, remain more opaque to lenders and are disproportionately affected by both structural and behavioral barriers.

While Information Asymmetry Theory provides a framework for understanding the interaction between borrower behavior and lender response, it has limitations. It does not fully capture social or institutional biases such as gender norms, cultural attitudes, and trust that shape financial decision-making beyond information availability (Zott & Huy, 2007). Nonetheless, its application in this study will help explain the demand-side behaviors of women entrepreneurs who internalize perceived constraints (Naegels et al., 2018).

### **2.3 Empirical Review**

Numerous studies have explored the factors that affect credit access among SMEs from various perspectives, including firm characteristics, collateral requirements, and gender disparities. The following subsection presents an empirical review of the specific factors examined in this study, with a focus on whether they influence access to credit among women-owned SMEs in Kenya. The review is structured around the study's key focus areas: credit perception, collateral availability and firm size.

#### **2.3.1 Credit Perception and Access to Finance**

The perceived complexity of loan terms-including interest rates, repayment schedules, collateral demands, and documentation requirements-significantly affects SMEs' willingness and ability to access formal finance (Nguyen et al., (2022). Understanding how entrepreneurs perceive the terms and processes of formal lending is critical to addressing the persistent gap in credit uptake among SMEs, particularly women-owned enterprises. While many studies have focused on supply-side barriers such as interest rates, collateral requirements, or institutional capacity, growing attention is being paid to credit perception indicated by a self-reported view of the complexity, transparency, and fairness of loan terms (Dutta & Mallick 2022; Simba et al., 2024). Entrepreneurs who view loan conditions as complicated, opaque, or unfavorable are less likely to apply for credit, particularly women-owned firms that may have lower financial literacy or less confidence navigating formal financial systems (Naegels et al.,2018; Morsy et al., 2019; Garwe & Fatoki, 2012).

These perceptions create behavioral barriers that reduce demand for formal loans, even when credit supply exists. The studies reviewed in this section show how perceived loan complexity, fear of rejection, and mistrust in financial institutions intersect with gender to shape borrowing behavior.

In Europe, Canton et al., (2013) examined the determinants of perceived access to bank loans among SMEs in 25 European countries using data from 3500 firms and found that smaller firms perceive greater difficulty accessing bank loans, due to information asymmetry and lack of formal documentation. The research confirmed that firm size had a significant effect on loan accessibility perception. These insights support the argument that structural firm characteristics influence both lender behavior and borrower perceptions. Similarly, Ključnikov, et al., (2025) examined how personal attitude, subjective norm, and perceived behavioral control shape access to bank credit across 1,367 enterprises in Central and Eastern Europe. Using binary logistic regression, they found that perceived behavioral control significantly and positively affected credit access, while personal attitude showed no significant influence across countries. Interestingly, subjective norm only affected access in specific contexts underscoring the role of cultural and institutional differences in shaping financing behavior. These studies however, focused on the determinants of perceived constraints in access without linking them to credit outcome, which was addressed by current study.

Dutta and Mallick (2022) conducted a study using World Bank Enterprise Survey data on Indian firms to examine whether perceived constraints in accessing finance differ by the gender composition of firm ownership. Their analysis revealed that while there is no significant difference in perceived financial barriers between male-owned firms and those with minority female ownership (less than 50%), firms with majority female ownership (more than 50%) report significantly greater perceived constraints in accessing finance compared to both male-owned and minority-female-owned firms. The authors attribute these differences to both demand- and supply-side factors, including business inexperience, weaker networking, and lender perceptions shaped by signaling and gender congruity theories. Their findings suggest that majority-female-owned firms must negotiate more actively to access finance, as they face stereotypical and gendered beliefs about their

entrepreneurial abilities. Interestingly, when funding sources are personal savings, family and friends, or client advances, majority-female-owned firms do not perceive greater financial barriers than their counterparts. This suggests that access to informal or relationship-based financing might mask gender-based credit perception differences in some contexts. However, this study does not link credit perceptions to access outcomes which is the focus of the current study.

Morsy et al., (2019) conducted a broader study providing empirical evidence that complex loan application procedures are a significant barrier discouraging women entrepreneurs from seeking formal credit in Africa. Using World Bank Enterprise Survey firm-level data from 47 African countries, the authors found that women managers are more likely than men to self-select out of the credit market, not because of direct discrimination by banks, but due to their own perceptions of low creditworthiness and the intimidating complexity of loan processes. Specifically, for women who needed a loan, “application procedures were complex” emerged as one of the top reasons for not applying, alongside unfavorable interest rates. The study’s findings indicate that these demand-side perceptions-particularly regarding the complexity and opacity of loan terms-play a critical role in widening the gender gap in access to finance. Importantly, the authors disentangle this self-selection behavior from supply-side discrimination, concluding that even in the absence of overt bias from lenders, perceived loan complexity can independently discourage women from participating in the formal credit market. The current study provides localized evidence on the influence of perceived credit barriers on credit seeking behavior in Kenya.

Similarly, Garwe and Fatoki (2012) investigated the impact of gender on SME characteristics and access to debt finance in South Africa using survey data and statistical analysis. The study found significant gender differences in the demand for debt finance, with female SME owners less likely to apply for external credit compared to their male counterparts. However, there were no significant gender differences in the availability of debt finance once applications were made. The research also identified notable gender differences in firm and entrepreneurial characteristics, suggesting that women-owned SMEs often face unique challenges in business ownership and credit-seeking behavior. Importantly, the study highlighted that discouragement and self-exclusion rather than

outright discrimination in lending are key barriers for female entrepreneurs, as women are more likely to refrain from applying for credit due to perceived rejection or risk aversion aligning with the cognitive bias pathways identified by Morsy et al. (2019). This study, however, does not focus the role of firm size in moderating the perceived low creditworthiness and credit access which was addressed by this current study.

Similar evidence was found in a study conducted in Tanzania. Naegels et al., (2018) investigated the influence of institutional view on access to formal loan financing, a study focusing on women-owned enterprises. The goal was to find out how the perception of the institutional environment influences their willingness to seek formal credit. Using survey data, the study found that unclear loan conditions, high interest rates, and extensive documentation requirements significantly reduce women entrepreneurs' propensity to apply for formal loans. Complementing the quantitative analysis, qualitative interviews revealed that cognitive barriers, such as mistrust of financial institutions and difficulties understanding loan terms were as critical as formal regulatory constraints in deterring women from borrowing. These findings align with broader evidence from Tanzania showing that women face multifaceted challenges in accessing finance, including limited collateral ownership, financial illiteracy, and negative perceptions of loan processes (International Labour Organization, 2019; IFC, 2017). The study underscores the need for both procedural complexities and cognitive dimensions of credit access to be addressed to improve financial inclusion for women entrepreneurs. This study, however, does not quantitatively focus on the extent to which perception interacts with firm characteristics like size to influence credit seeking behavior a gap addressed by this study.

Beck et al., (2006) provided empirical evidence on the adverse effects of loan procedure complexity on SMEs' access to finance across multiple countries. Utilizing extensive cross-country firm-level data, their econometric analysis revealed that SMEs operating in countries with more complex loan application processes face significantly greater barriers to obtaining credit. They found that age, size and ownership structures are a significant determinant of access to finance, and institution development was the most important factor in cross country variation in access to finance. The study also highlighted that complexity

in loan procedures characterized by cumbersome documentation requirements, unclear lending criteria, and prolonged processing times exacerbates information asymmetry between lenders and borrowers. This asymmetry increases transaction costs for both parties, discouraging many SMEs from even applying for formal loans and leading to higher rejection rates among those who do apply. The findings underscore that procedural complexity is not merely an administrative hurdle but a critical factor that systematically limits SMEs' financial inclusion. By increasing the perceived and actual costs of borrowing, complex loan processes disproportionately impact smaller firms, which typically lack the resources and expertise to navigate such bureaucratic challenges. This broad view aligns with earlier studies but introduces the institutional variable suggesting that reforming the banking ecosystem itself through digitization and SME-focused products is a potential lever for change. However, they do not disaggregate the findings by gender unlike the current study which will focus on women-owned SMEs.

Moreover, a study conducted by Nguyen et al. (2022) found that a significant number of SMEs self-ration from formal loans due to the perception that the application process is too difficult. The researchers explored how small and medium enterprises (SMEs) in Vietnam respond to constraints in accessing formal credit by shifting to various forms of informal finance. Using a decade-long panel dataset, the study found that SMEs facing increased formal credit barriers such as complex application processes, high interest rates, or poor credit history tend to substitute formal loans with informal sources like trade credit, private money lenders, and loans from family and friends. The type of informal finance selected depends on the specific formal constraint encountered: for example, cumbersome loan procedures lead firms to borrow from relatives or private lenders, while high interest rates prompt a preference for trade credit and family loans. Notably, trade credit was the main alternative for firms with poor credit histories, and private lenders are often used for emergency funding when short-term loans are denied. These findings imply that in emerging markets, informal finance serves as a vital substitute for formal credit, with SMEs' choices tailored to the nature of the financing barrier they face. However, the focus on informal substitutes leaves the influence of other factors such as credit perception and firm size on credit access unexplored. This study focused on these unexplored variables.

The Kenya Bankers Association (2021) reported that 28% of MSMEs cited complex loan application procedures and documentation requirements as a primary reason for constrained access to finance. A survey of 279 respondents found that many SMEs avoid formal loans due to perceived complexity and unfavorable terms, such as hidden charges and rigid repayment schedules. According to the survey, 22% of them reported that the lengthy processing time for bank loans discouraged them from applying. These findings indicate that nearly one in three MSMEs are deterred from seeking formal credit due to perceived procedural complexity. This barrier was reported to disproportionately affect younger, smaller and women owned firms hence the qualifying the need for banks to develop more transparent and borrower-friendly loan products to increase uptake among SMEs, particularly those led by women and younger entrepreneurs. This study, however, did not specifically focus on women-owned SMEs and on how these perceptions affect actual credit access A gap which the current study addresses.

Across the reviewed literature, a consistent theme emerges around the psychological and procedural barriers that hinder access to finance, particularly among women-owned firms. While studies such as Garwe and Fatoki (2012) highlight self-exclusion driven by fear of rejection and risk aversion, others like Dutta and Mallick (2022) emphasize the role of external perceptions such as lender biases shaped by gender stereotypes in shaping financial access. Still, procedural complexity remains a dominant barrier, as shown in Beck et al. (2006) and Naegels et al. (2018), where complex loan conditions and documentation deter women from applying. Although these studies establish that perceived complexity and credit market expectations shape financial behavior, few link these perceptions directly to actual access outcomes and examine the extent to which firm-level characteristics like firm size may affect this relationship. Therefore, this study will address these gaps by assessing the extent to which credit perception affects both the intention to apply and the actual success in obtaining credit, while also examining the role of firm size on this relationship. Hence providing a more holistic understanding of how perception translates into real-world financing outcomes for women entrepreneurs in a resource-constrained setting.

### **2.3.2 Collateral and Access to Finance**

Globally, collateral requirements constitute a major institutional barrier for SMEs seeking formal finance with several studies highlighting their disproportionate adverse effect on women-owned firms (Bellucci et al., 2010; Onkundi et al., 2023; Sakwa et al., 2019; Simba et al., 2024). Financial institutions typically require borrowers to pledge assets as security to mitigate credit risk. However, this practice structurally disadvantages SMEs, especially women-owned firms who often lack high value assets or face challenges related to asset ownership, valuation, and legal perfection (Financial Sector Deepening Kenya, 2018). This section examines both global and local literature on how collateral requirements affect credit access.

Internationally, Bellucci et al., (2010) examined the role of borrower and lender dynamics in determining both the price and non-price terms of the loan contracts, using data from over 7,800 credit lines extended to sole proprietorships by a major Italian bank listed on the Milan Stock Exchange. The study found no evidence of gender-based discrimination in loan pricing; however, women-owned businesses were significantly disadvantaged in terms of collateral requirements and overall credit availability. A key insight was that women's limited ownership of assets restricted their ability to meet collateral demands, a structural inequality that continues to hinder their access to formal finance. This barrier not only reduces their likelihood of securing loans but also has broader implications on firm growth and participation in the formal economy. This study, however, focused on actual constraints without a specific focus on the effect of perceived constraints which was addressed by current study.

Rahman et al., (2017) conducted an empirical study to examine the determinants of collateral requirements for SME loans across the Visegrad countries: Czech Republic, Slovak Republic, Hungary, and Poland. Using data from the Business Environment and Enterprise Performance Survey (BEEPS) and employing binary logistic regression analysis, the authors found that riskier borrowers are more likely to be required to pledge collateral, and that reducing asymmetric information can lower the incidence of collateral requirements for SMEs. The study also revealed that female borrowers are more likely to be asked for collateral than male borrowers as they are perceived to be riskier, indicating

gender bias in lending practices. Furthermore, the research found that loans with longer maturities and those in manufacturing sectors are more likely to be collateralized, and that bank-borrower proximity can reduce collateral requirements, while higher bank concentration tends to increase them. Their results emphasized that gender bias, asymmetric information, and bank concentration all heightened collateral requirements, particularly for loans with longer maturities in the manufacturing sector. The study however, focused narrowly on collateral requirements without a focus on credit perception and the role firm size.

Further findings from Africa reveal how collateral interacts with credit perception and gendered financial norms. Simba et al., (2024), conducted a large-scale empirical study to investigate how collateral security availability, collateral security value, and the gender of SME owners influence involuntary financial exclusion among manufacturing SMEs in Africa. Utilizing data from the World Bank Enterprise Survey, the study analyzed responses from 13,783 manufacturing SMEs across 41 African countries. The researchers employed logit regression models to examine how these factors affect both the perception and reality of credit access, as well as SMEs' motivation to apply for loans. The findings reveal that the use of collateral security and its assessed value, alongside gender biases within African financial markets, significantly reduce the likelihood of SMEs obtaining credit. These constraints also diminish owners' perceptions of their chances of securing business finance and lower their motivation to apply for credit. The findings highlight the need for more inclusive financial services, that adopt flexible collateral requirements and operates within an institutionally robust environment that meets the unique needs of African SMEs. This study, however, did not focus on a specific gender and country-level findings. This current study fills this gap by focusing on women-owned manufacturing firms in Kenya.

Additionally, Brixiová et al., (2020) examined the impact of land ownership on the performance of women entrepreneurs in Eswatini, Lesotho, and Zimbabwe using World Bank Enterprise Survey data. Their study found that women entrepreneurs face greater constraints in accessing credit than men, primarily due to a lack of collateral assets such as land. Land ownership was shown to be particularly important for the sales performance of

women-owned firms, especially for larger enterprises. However, for micro and small firms, access to short-term working capital loans was more critical for growth and innovation than land ownership itself. The authors recommended improving women's property rights and access to land, as well as enabling financial institutions to lend against movable collateral, could significantly enhance the performance and credit access of female entrepreneurs in Southern Africa. This study, however, narrowly focused on actual credit constraints without focusing on other demand driven behavioral factors such as credit perception, a gap which was addressed by current study.

Nwosu et al. (2020) conducted an empirical study examining the role of social capital in determining access to credit among household nonfarm enterprises in Nigeria. Using data from the General Household Survey (GHS), the study applied a Probit and Heckman selection model to assess both the likelihood of obtaining credit and the amount borrowed. The findings revealed that membership in cooperatives and informal groups significantly increased the probability of accessing credit and using it to operate enterprises. Specifically, belonging to informal groups increased the probability of accessing credit by 1.88%, while cooperative membership had a similarly significant positive effect on both access and loan utilization. Consequently, for SMEs social networks and group affiliations act as a form of social collateral. This study did not focus on women-owned SMEs, a gap this current study seeks to fill.

In Kenya, collateral requirements remain a central focus in studies examining barriers to SME credit access. Onkundi et al., (2023) investigated the influence of collateral availability on access to credit among SMEs in Meru County. Using a descriptive survey of 384 SME owners, the study found that many SMEs could access credit from SACCOs without traditional collateral using guarantors' savings as security. However, access to credit from banks and microfinance institutions remained heavily dependent on the availability of collateral. The findings highlighted that collateral requirement are a significant barrier for SMEs seeking formal finance, with many enterprises being excluded from bank credit due to insufficient assets to pledge. This study, however, did not disaggregate the findings based on gender. The current study focused on women-owned firms.

These findings align with those of Mwirigi et al., (2021) who conducted a study in Nairobi, Kenya to examine how collateral affects the strategic access to credit facilities among women- owned SMEs. Using a descriptive cross-sectional survey of 370 women owner, the authors found that the nature, value and cost of collateral affected women entrepreneurs' ability to secure formal credit. Specifically, 44% of respondents agreed that the type and liquidity of collateral influences lending decisions, while 45% agreed that higher collateral value increases the likelihood of loan approval. Additionally, 44% indicated that the legal costs of perfecting collateral discouraged them from applying for credit. It follows that women entrepreneurs' awareness of these formal credit market dynamics such as the importance of collateral type, liquidity, and associated legal costs significantly informs their financial decision-making and may reduce their likelihood of applying for credit. This study, however, narrowly focused on collateral overlooking the role of firm size and credit perception which is the current study's focus.

Additionally, the use of technology, and access to social networks has been shown to mitigate the impact of traditional lending requirements. Mdoe and Kinyanjui (2018), found that MSMEs whose owners use mobile banking, mobile money, and participate in group networks have a significantly higher probability of receiving formal credit and informal credit. They used cross-sectional data from the 2016 FinAccess Household Survey and concluded that both mobile technology and social network participation help overcome information asymmetry and collateral challenges, thereby enhancing MSMEs' access to both formal and informal credit. These findings suggest that even where traditional lending barriers such as lack of collateral exist especially for women entrepreneurs, leveraging mobile financial services and group affiliations can be effective strategies for improving credit access. This study, however, did not specifically focus on women-owned SMEs unlike this current study.

Further, Sakwa et al., (2019) investigated the influence of collateral security on the performance of small and medium enterprises (SMEs) in Turbo Sub County, Kenya. Using a descriptive and correlational research design with a sample of 340 entrepreneurs, the study found that collateral security has a positive and significant effect on both access to

credit and the performance of SMEs. Specifically, SMEs that were able to provide collateral accessed loans more easily and subsequently reported better business performance compared to those without collateral. Mutuku et al., (2019) carried out a similar study in Nairobi. They investigated the determinants of credit accessibility among small and medium enterprises (SMEs). Using a descriptive survey design and questionnaire-based data collection, the study found that both firm characteristics and collateral aspects significantly influence access to credit. Longer operational periods and higher turnovers improved credit processing prospects, while collateral requirements, especially the preference for personal guarantors, played a major role in credit approval. However, the demand for high-value collateral was found to hamper SMEs' access to credit. These findings highlight that limited acceptable collateral remains a major barrier to credit access for many SMEs, which in turn constrains their growth and innovation (Quartey et al., 2017). This study, however, did not have a specific focus on women-owned SMEs which is the focus of this current study.

These findings highlight that collateral requirement adversely affect access to finance among SMEs, from a general and a gendered perspective. However, there is scanty literature on the extent to which collateral availability shapes credit seeking behavior by women-owned firms, and whether the influence varies by firm size. Additionally, the highlighted Kenyan studies focus broadly on SMEs, with little disaggregation by gender or industry. Yet, manufacturing enterprises face distinct financing dynamics due to their capital intensity, and women in this sector face compounded barriers linked to both gender norms and asset ownership (Mugenyi et al., 2020). This study addresses these gaps by examining the extent to which availability collateral shapes credit seeking behavior among women-owned manufacturing SMEs in Nairobi, Kenya and the role of firm size on this relationship.

### **2.3.3 Firm Size and Access to Credit**

Firm size is a critical determinant of access to finance, with larger firms consistently demonstrating greater credit availability (Beck et al., 2006). This advantage is largely attributed to their substantial asset base, established credit histories, and lower perceived risk by lenders (Simba et al., 2024). These attributes act as signals of lower credit risk,

making larger firms more attractive to lenders. Additionally, firm size has also been found to influence firm's confidence in credit application with larger firms perceiving themselves to be more bankable (Canton et al., 2013). For women, these conclusions are contested. Some researchers argue that women deliberately keep their businesses small to avoid the risks associated with formal credit hence access to finance is not necessarily a challenge since they require low capital investment (Marlow & Carter, 2004; Quartey et al., 2017). Whereas others confirm that larger women-owned firms perceive higher constraints compared male counterparts (Hansen & Rand 2014). This cautious approach has led to self-exclusion of women-owned firms from financial markets (Morsy et al., 2019).

Globally, research has shown that size disadvantage often positions women entrepreneurs as higher-risk borrowers. Nonetheless, even after controlling for firm and industry characteristics, Morazzoni and Sy (2022) found that women were just as likely to apply for credit as their male counterparts but were rejected at significantly higher rates despite comparable risk profiles using micro-level data from a panel of US firms. The sample included new firms operating between 2007 and 2011 from The Kauffman Survey Firm Survey data. According to Morazzoni and Sy (2022), women entrepreneur's applications were more likely to be rejected, and not because of worse risk profiles or low profits. This challenges assumptions that women are inherently more risk-averse or reluctant to borrow. Instead, it points to supply-side discrimination. This study, however, focused on quantifying the gender gap and analyzing credit seeking behavior in the context of a developed country, a gap addressed by current study which focused on Kenya an emerging economy.

On the contrary, Ferreira et al., (2023), analyzed Portuguese firm-level data and concluded that large firm size does not automatically translate into credit access. They found that financial constraints persist even among large firms, indicating that size benefits are not uniformly distributed and may be mediated by other factors, including gender and industry type. While larger firms generally benefit from better access to finance due to their ability to leverage tangible assets and maintain established credit histories, the presence of financially constrained large firms highlights the heterogeneity within firm size categories.

This study focused on findings from a developed economy while current study focused on Kenya, a developing economy.

Crisis contexts such as the COVID-19 pandemic further exposed firm size vulnerabilities. Gur et al. (2023) reported that micro and small firms in Istanbul faced higher rejection rates, collateral demands, and longer loan approval times than larger firms. Through a survey conducted in Istanbul, the study also revealed that these firms were more inclined to report challenges such as loan application rejections, longer approval periods and higher collateral requirements compared to medium and large firms. Consequently, smaller firms were found to often rely heavily on informal sources of financing like friends and family. These findings highlight that particularly during periods of heightened uncertainty like the pandemic, firm size remains a crucial determinant of financial access, with smaller enterprises being disproportionately excluded from formal financial channels. These study however, did not have a specific focus on women-owned firms, a gap that was addressed by current study.

In Sub-Saharan Africa, Hansen and Rand (2014) examined gender differences in access to credit among manufacturing firms in 16 Sub-Saharan African countries and found that women-owned larger firms reported greater perceived credit constraints. Using perception-based measures, women-owned firms reported being more credit constrained, while no significant gender gap was observed using formal credit access data. Surprisingly, the study revealed that male-owned small firms were more disadvantaged, whereas female-owned larger firms faced greater perceived constraints. Importantly, firm size emerged as a key moderating factor, with larger women-led firms more likely to perceive credit as a major obstacle despite having comparable objective access. These findings underscore the complex interplay between gender, perception, and firm size in shaping access to finance; however, there's no focus on the factors that drive credit access at a country-level. This current study focused on country-level findings.

In West Africa, Quartey et al., (2017) identified firm size as a key predictor of credit access alongside ownership structure and legal frameworks. The study utilized data from the World Bank Enterprise Survey to examine the determinants of access to finance both at the

country and sub- regional level. Their multi-country analysis showed that larger firms are 40% more likely to secure loans than smaller counterparts, emphasizing the role of size in mitigating lender risk perceptions. This aligned with Beck et al. (2006)'s foundational global study, which linked firm size to reduced information asymmetry, enabling larger firms to provide collateral and transparent financial records. At the sub-regional level, Beck et al., (2006) confirmed that the gender of a firm's top manager significantly influences access to finance, but this effect appears to be context-specific, as evidenced by findings from Mali. Contrary to the widespread view that women entrepreneurs face greater financial barriers than men, the study reveal that in Mali, female top managers do not experience disproportionate difficulties in obtaining finance. This anomaly may be explained by unique characteristics of the Malian economy. First, government policies aimed at supporting SMEs have been tailored to favor women-owned businesses, partly to achieve the Millennium Development Goals (MDGs), thereby enhancing women's access to financial resources. Second, many Malian women operate small-scale businesses that require relatively low capital investment, reducing their need to seek external financing from banks or formal financial institutions. Consequently, female top managers in Mali were less likely to encounter challenges in accessing finance compared to their male counterparts. These findings highlight the importance of considering local economic and policy environments when assessing gender disparities in credit access. This current study focused on country-level findings of the factors affecting credit seeking behavior for a specific gender.

In Kenya, recent local studies reinforce these findings. Tiriongo et al., (2025) analyzed data from the Kenya Bankers Association's Inuka program, the aim of this program established in 2018 was to support micro, small and medium enterprises (MSMEs) access finance from banks. They found that micro-enterprises (with annual turnovers below KES 500,000) face the steepest barriers, with only 22% accessing formal loans compared to 58% of medium-sized firms. Their propensity scores matching analysis confirmed that firm size and turnover are pivotal in determining credit eligibility. This study, however, did not focus on the women-owned SMEs. Similarly, Ng'anga (2015) investigated constraints to formal finance for small and medium manufacturing firms in Kenya, using World Bank Enterprise

Survey data. The study found that firm size is a significant determinant of access to formal finance: larger and registered firms, as well as those with more experienced managers, are more likely to secure formal credit. In contrast, smaller manufacturing SMEs face greater barriers, often due to limited collateral and informality. The study also highlighted those negative perceptions of corruption and informal competition further reduce the likelihood of accessing finance for these smaller firms. These findings reinforce the view that firm size plays a critical role in determining access to finance among Kenyan manufacturing SMEs, however, this study did not specifically focus on credit seeking behavior among women owned manufacturing SMEs, a gap which was addressed by this current study.

On the credit supply side in Kenya, Shikumo and Mirie (2020) examined determinants of lending to SMEs by commercial banks in Kenya. Using a population of 43 banks and annual published reports they found that bank size positively affects lending to SMEs, while liquidity negatively affected it. However, the credit risk and interest rates had no significant influence on lending to SMEs by commercial banks in Kenya. This study established those effective policies for banks to grow translate into a favorable loan term for SMEs. For women-owned business gender innovative policies backed by a robust business environment for banks to grow is paramount support access to credit for women owned SMEs. While informative, this study focused purely on the supply-side factors. The current study complements this by addressing demand side and structural factors that influence credit access among women-owned SMEs.

Evidently, firm size is widely recognized as a strong predictor of credit access globally and in Kenya, but its influence becomes more nuanced when gender is considered. While larger firms generally enjoy better access to finance, this advantage does not always apply to women-owned enterprises, where perceptions of constraint persist despite objective creditworthiness. Studies show conflicting evidence, some attribute credit exclusion to small size (Canton et al., 2013; Quartey et al., 2017), while others find that even large, women-owned firms report high perceived barriers (Hansen & Rand, 2014), and some large firms also face constraints (Ferreira et al., 2023). Most existing research treats firm size as a control or direct factor, with little focus on its role on the relationship between credit perception, collateral and credit-seeking behavior especially in gendered contexts.

This study fills that gap by examining the extent to which firm size influences the link between the drivers of credit access and credit seeking behavior among women-owned manufacturing SMEs in Kenya.

## **2.4 Summary of the Literature and Research Gaps**

Access to credit remains a critical enabler of SME growth, yet women-owned enterprises continue to face disproportionate constraints both structural and behavioral (Beck et al., 2006). Although the literature generally agrees that women-owned SMEs face greater financing constraints than their male counterparts, findings differ regarding how these constraints arise. Bellucci et al. (2010) found no evidence of gender discrimination in loan pricing but reported that women-owned firms faced stricter collateral requirements and lower credit availability. In contrast, Morazzoni and Sy (2022) found that women entrepreneurs were just as likely to apply for credit as men but experienced significantly higher rejection rates despite comparable risk profiles. These findings suggest that discrimination may occur at different stages of the lending process depending on institutional and market contexts. Contradictory evidence also exists regarding the role of firm size. While Beck et al. (2006), Quartey et al. (2017), and Gur et al. (2023) found that larger firms enjoy greater access to finance due to stronger asset bases and lower perceived risk, Ferreira et al. (2023) demonstrated that financial constraints may persist even among large firms. Similarly, Hansen and Rand (2014) found that larger women-owned firms reported higher perceived credit constraints than smaller firms, challenging the assumption that firm growth automatically improves access to finance.

With respect to collateral availability, most studies report a positive relationship between collateral and credit access (Rahman et al., 2017; Sakwa et al., 2019; Onkundi et al., 2023). However, studies such as Brixiová et al. (2020) and Simba et al. (2024) argue that collateral requirements may disproportionately disadvantage women entrepreneurs because of unequal asset ownership patterns and gendered property rights. These conflicting findings suggest that access to credit is shaped not only by objective firm characteristics but also by institutional, behavioral, and contextual factors.

While some studies find no significant gender-based disparities when firm characteristics are controlled (Cole et al., 2018; Galli et al., 2020), others report that women face higher rejection rates, stricter collateral demands, and tighter credit conditions (Bellucci et al., 2010; Morazzoni & Sy, 2022). A key gap in the literature lies in the underexplored effect of credit perception. Concisely, how women's beliefs about likely rejection deter them from applying, leading to self-exclusion (Naegels et al., 2018; Simba et al., 2024). This behavioral barrier remains largely overlooked in Kenya, where most studies emphasize structural constraints (Sakwa et al., 2019; Mwirigi et al., 2021). Additionally, firm size, though frequently controlled for, has not been examined as a moderator in the relationship between behavioral barriers and credit access. This study filled these gaps by analyzing how credit perception and collateral availability influence access to credit, and whether firm size moderates these relationships. The gaps were summarised in table 2.1.

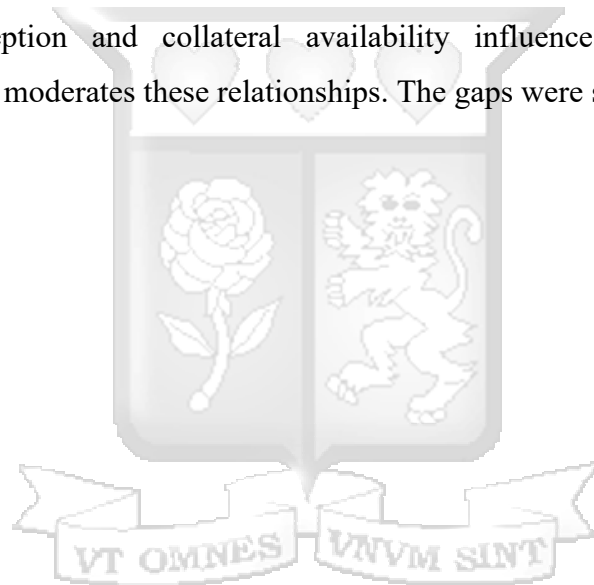


**Table 2.1: Summary of Literature and Gaps**

| <b>Author(s) &amp; Year</b>             | <b>Purpose of the Study</b>                                                                                       | <b>Key Findings</b>                                                                            | <b>Research Gaps Identified</b>                                      | <b>How Present Study Will Fill the Gaps</b>                           |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------|
| Beck, Demirguc-Kunt & Maksimovic (2006) | To examine determinants of financing obstacles for SMEs across countries                                          | Institutional quality and loan complexity are critical constraints on SME finance globally     | Limited focus on gender-specific barriers                            | Focus on women owned firms                                            |
| Naegels, Mori & D'Espallier (2018)      | To analyze access to finance by Tanzanian women-owned enterprises from an institutional perspective               | Perceived loan complexity reduces women entrepreneurs' willingness to seek formal credit       | No focus on structural factors                                       | Extends analysis to firm level characteristics and structural factors |
| Kinyanjui (2019)                        | To assess financing challenges faced by Kenyan MSMEs                                                              | High transaction costs and complicated loan requirements limit MSME credit uptake in Kenya     | Limited focus on gender differences and collateral requirements      | Focus on women owned firms                                            |
| Sakwa, Rambo & Osogo (2019)             | To investigate influence of collateral security on SME performance in Turbo Sub County                            | Collateral requirements restrict SME performance in Turbo Sub County, Kenya                    | No exploration of credit perception and gender                       | Integrates behavioral factors and provides a gendered perspective     |
| Morazzoni & Sy (2022)                   | To quantify the effect of the gender gap in credit access on entrepreneurship and capital misallocation in the US | Female entrepreneurs are more likely to face loan rejection and have higher returns to capital | Lacks firm-level empirical evidence a in developing country contexts | Provide firm-level, evidence, a developing country setting.           |

| <b>Author(s) &amp; Year</b>          | <b>Purpose of the Study</b>                                                                                                                               | <b>Key Findings</b>                                                                                                                                                                                                                                   | <b>Research Gaps Identified</b>                                                                                                                     | <b>How Present Study Will Fill the Gaps</b>                                             |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Dutta & Mallick (2022)               | To examine whether perceived financial constraints differ by degree of female ownership in Indian firms                                                   | Majority-female-owned firms perceive significantly greater financial constraints than male- or minority-female-owned firms; for personal/family funding, these differences disappear                                                                  | Limited exploration beyond firm ownership structure                                                                                                 | Focus beyond firm ownership structure to explore firm size and collateral requirements. |
| Simba et al. (2024)                  | To examine how collateral security, collateral value, and gender of SME owners influence involuntary financial exclusion among African manufacturing SMEs | Collateral security, collateral value, and gender biases significantly reduce credit access and motivation to apply for credit among African countries; these factors perpetuate involuntary financial exclusion                                      | Lack of micro-level studies focused on Kenya                                                                                                        | The present study will provide micro-level, evidence from Kenya                         |
| Morsy, El-shal & Woldemichael (2019) | To examine how women entrepreneurs' perception about their creditworthiness contributes to the gender gap in North Africa                                 | Women entrepreneurs are more likely to self- select themselves out of the credit market due to low perceived credit worthiness compared to their male counterparts, and the behavior is not a response mechanism to discriminatory lending practices. | Does not dig deeper into the specific factors that could be causing the low perceived credit worthiness like firm size and collateral availability. | Extends focus to the factors that lead to self-exclusion                                |

| <b>Author(s) &amp; Year</b>              | <b>Purpose of the Study</b>                                                                                 | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                              | <b>Research Gaps Identified</b>                             | <b>How Present Study Will Fill the Gaps</b>                       |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------|
| Quartey, Turkson, Abor, & Iddrisu (2017) | To examine the determinants of SME access to finance in West Africa (ECOWAS)                                | Firm size, ownership, legal rights, credit information, export orientation, and top manager experience are key determinants of access to finance. However, significant differences exist at the country level. In Mali, gender of the top manager significantly affects access, sometimes favoring women-contradicting conventional expectations | Limited exploration of why gender effects differ by country | Gender-disaggregated analysis for women-owned SMEs at micro-level |
| Gur, Babacan, Aysan, & Suleyman (2023)   | To examine how firm size affected SMEs' access to finance during the COVID-19 pandemic in Istanbul, Türkiye | Micro and small firms faced greater barriers to formal credit, relied more on informal finance, and reported higher collateral requirements and loan rejections than medium or large firms                                                                                                                                                       | Does not address gender dynamics                            | Gender-disaggregated analysis for women-owned SMEs                |
| Ng'ang'a (2015)                          | To examine constraints to formal finance for small and medium manufacturing firms in Kenya                  | Larger and registered firms, and those with experienced managers, are more likely to access formal finance; smaller firms face more barriers, especially due to informality, lack of collateral, corruption, and informal competition                                                                                                            | Does not disaggregate findings by gender                    | Gender-disaggregated analysis for women-owned SMEs                |

| <b>Author(s) &amp; Year</b>               | <b>Purpose of the Study</b>                                                                                                                                                        | <b>Key Findings</b>                                                                                                                                                                           | <b>Research Gaps Identified</b>                                                | <b>How Present Study Will Fill the Gaps</b>      |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------|
| Onkundi, Munene, & Walubuka (2023), Kenya | To examine the influence of collateral availability on access to credit among SMEs in Meru County, Kenya                                                                           | Collateral is a major barrier for SMEs accessing bank and MFI credit; SACCOs offer more flexible alternatives using guarantors' savings.                                                      | Does not disaggregate findings by gender, and demand driven behavioral factors | Focus on women-owned manufacturing SMEs in Kenya |
| Garwe & Fatoki (2012), South Africa       | To investigate whether female-owned SMEs differ from male-owned SMEs in terms of (1) demand for and availability of debt finance, and (2) firm and entrepreneurial characteristics | The study found significant gender differences in demand for debt finance but none in its availability.                                                                                       | Does not focus on the Kenyan context                                           | Focus on women-owned SMEs in Kenya               |
| Mdoe & Kinyanjui (2018), Kenya            | To examine the impact of mobile telephony and social networks on access to credit among MSMEs.                                                                                     | MSMEs using mobile banking, mobile money, and participating in group networks have higher probabilities of receiving formal credit for informal credit, group participation increases access. | Does not disaggregate findings by gender and demand driven behavioral factors  | Focus on women-owned SMEs                        |
| Mutuku, M'ithiria, & Ntale (2019), Kenya  | To investigate determinants of credit accessibility among SMEs                                                                                                                     | Firm characteristics (operational period, turnover) and collateral (especially personal guarantors) significantly influence credit access. High-value collateral requirements hinder access   | Does not disaggregate findings by gender, and demand driven behavioral factors | Focus on women-owned SMEs in Kenya               |

Source: Author (2025)

## 2.5 Conceptual Framework

The conceptual framework of this study includes the dependent variables, independent and control variables. The dependent variable selected is measured by credit application (Simba et al., 2024; Quartey et al, 2017). The independent variables selected are credit perception and collateral while firm size is a moderator. The credit perception is measured by taking into consideration the question asked by WBES to managers. They are asked to evaluate the difficulty of access to finance, including availability and cost, interest rates, fees and collateral requirements (Dutta & Mallick, 2022). This variable is measured on a five-point Likert scale. The second variable was firm size. Firm size was measured by number of employees (Ng'ang'a, 2015; Simba et al., 2024) while the collateral availability was measured the percentage of fixed assets owned by the firm (Simba et al.,2024). SMEs that own more of the business assets are likely to apply for credit and access external finance (Beck et al., 2006) The study will control for experience, firm age, training, corruption and export certificate (Simba et al., 2024). It is expected that the more years accrued by the manager, the more knowledge hence a positive outcome, and higher credit rating (Mwirigi et al., 2021). Firm's age was an important variable to control for since SMEs with long periods of existence, have long term relationships that reduce information asymmetry (Rahman et al.,2017). Corruption was measured by the question on whether corruption posed an obstacle for women-owned SMEs access to finance (Beck & Demirguc-Kunt, 2006). Statnik et al., (2023) found that women entrepreneurs are discouraged by corruption to seek for credit by corruption compared to male borrowers hence an important variable to control for. SMEs attention to training was controlled for since it implies that they understand the dynamics of the business environment. Similarly, quality certificate was a binary variable denoting business accreditation and potential positive influence on credit access (Simba et al., 2024).

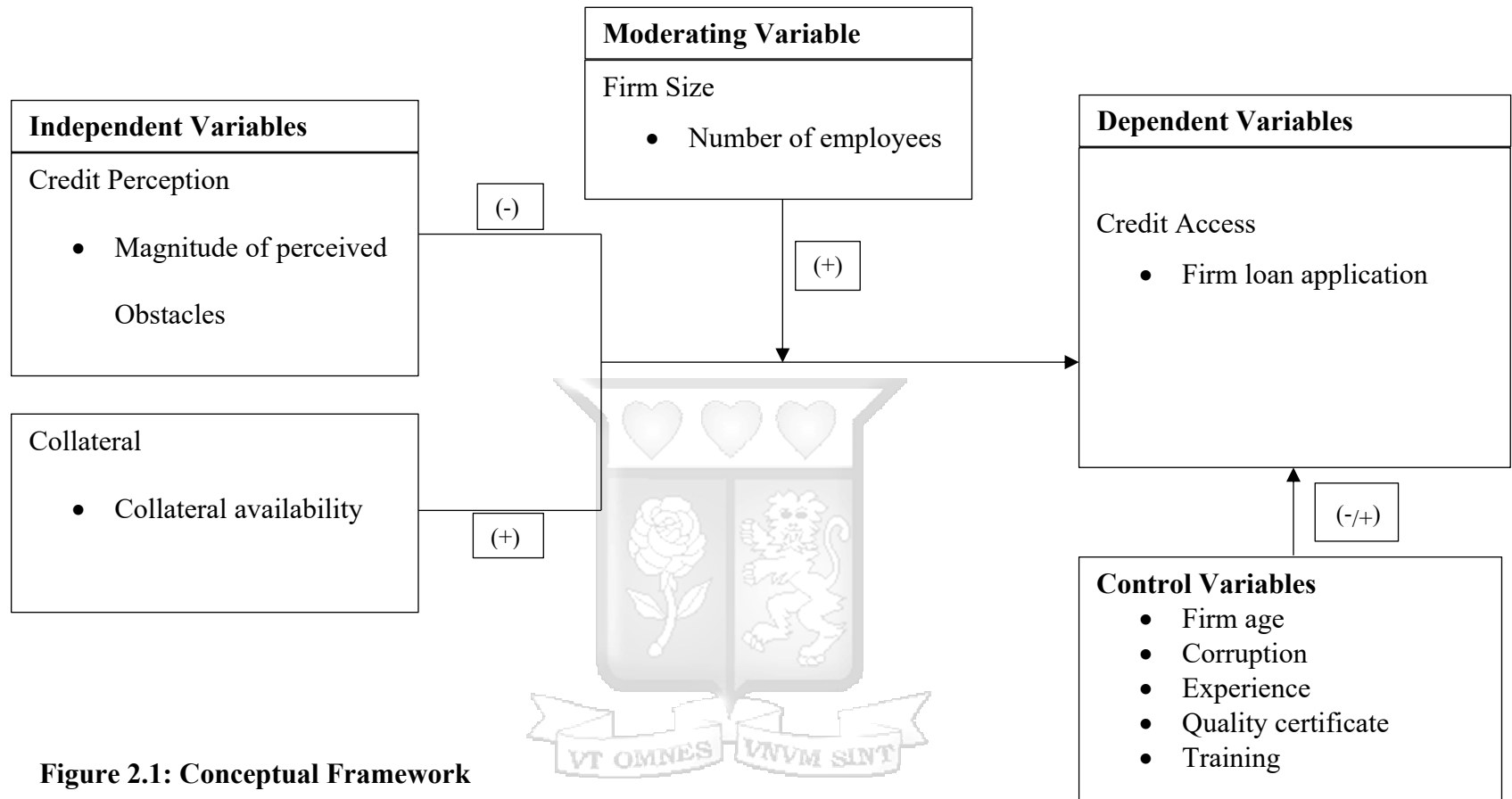


**Figure 2.1: Conceptual Framework**

Source: Author (2025)

### 2.5.1 Operationalization of the Variables

**Table 2.2: Operationalization of variables**

| Variable                   | Variable type | Description                                                            | Measurement                                                                                                            | Supporting Literature                            | Source | Supporting Theory           |
|----------------------------|---------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------|-----------------------------|
| <b>Dependent variable</b>  |               |                                                                        |                                                                                                                        |                                                  |        |                             |
| Credit access              | Binary        | Firms' credit access - whether the firm got approved for a loan or not | Categories:<br>1= Yes<br>0= No                                                                                         | Galli et al.,2020                                | WBES   | Theory of Planned Behaviour |
| <b>Independent factors</b> |               |                                                                        |                                                                                                                        |                                                  |        |                             |
| Firm Size                  | Categorical   | Size of the firm                                                       | Number of employees                                                                                                    | Ng'ang'a (2015)                                  | WBES   | Information Asymmetry       |
| Collateral Availability    | Continuous    | Assets used as collateral                                              | World Bank Collateral Index                                                                                            | Simba et al., (2024)                             | WBES   | Information asymmetry       |
| Credit Perception          | Binary        | Magnitude of perceived obstacles in accessing finance                  | 5-point Likert Scale<br>0- No obstacle,<br>minor obstacle,<br>moderate obstacle,<br>1- severe obstacle,<br>very severe | Dutta & Mallick, (2022),<br>Simba et al., (2024) | WBES   | Theory of Planned Behaviour |
| <b>Control variables</b>   |               |                                                                        |                                                                                                                        |                                                  |        |                             |

| Variable                      | Variable type    | Description                                                    | Measurement                                                                                                                 | Supporting Literature                          | Source | Supporting Theory |
|-------------------------------|------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------|-------------------|
| Experience                    | Continuous       | Years of sectorial experience                                  | Number of years                                                                                                             | Ng'ang'a (2015)                                | WBES   |                   |
| Corruption                    | Binary           | Magnitude of perceived corruption                              | 5-Point Likert Scale<br>0- <i>No obstacle, minor obstacle, moderate obstacle,</i><br>1- <i>Severe obstacle, very severe</i> | Simba et al., (2024)                           | WBES   |                   |
| Firm Age                      | Continuous       | Firm age in years since establishment                          | Survey Year – Registration Year                                                                                             | Simba et al., (2024); Dutta and Mallick (2022) | WBES   |                   |
| Quality certificate           | Binary           | Having an internationally recognised quality certification     | Yes=1, No=0                                                                                                                 | Simba et al., (2024)                           | WBES   |                   |
| Training                      | Binary           | Having formal training programs for employees                  | Yes=1, No=0                                                                                                                 | Simba et al., (2024)                           | WBES   |                   |
| Credit perception * Firm Size | Interaction Term | Interaction between credit perception and firm size categories | Computed                                                                                                                    |                                                |        |                   |

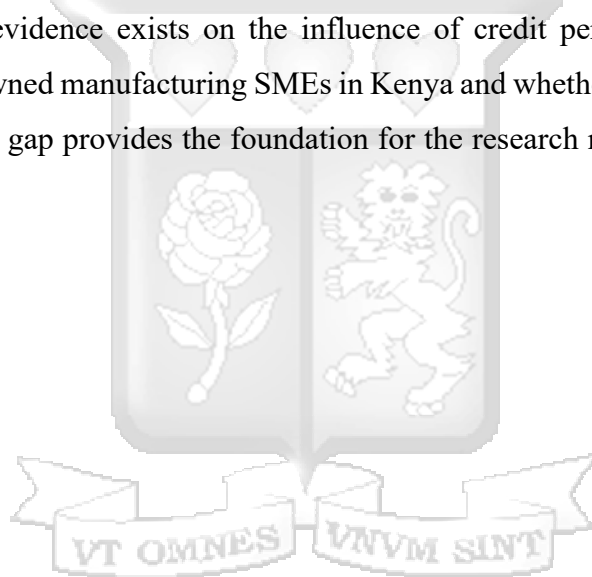
| <b>Variable</b>           | <b>Variable type</b> | <b>Description</b>                                      | <b>Measurement</b> | <b>Supporting Literature</b> | <b>Source</b> | <b>Supporting Theory</b> |
|---------------------------|----------------------|---------------------------------------------------------|--------------------|------------------------------|---------------|--------------------------|
| Collateral *<br>Firm size | Interaction<br>Term  | Interaction between collateral and firm size categories | Computed           |                              |               |                          |

Table 2.2 summarizes the operationalization of the study variables and demonstrates how theoretical constructs were translated into measurable indicators using the WBES data. Credit access was operationalized as a binary outcome reflecting whether a firm obtained formal credit. Credit perception captured entrepreneurs' perceived constraints in accessing credit, while collateral availability reflected the firm's ability to provide assets that signal creditworthiness to lenders. Firm size, measured by the number of permanent full-time employees, was incorporated as a moderating variable to assess whether the influence of credit perception and collateral availability on credit access varies across firms of different sizes. The selected control variables, including firm age, owner experience, corruption, training, and quality certification, were included to account for other firm-level factors that may influence credit access. Collectively, these variables provide a framework for examining both the behavioral and structural determinants of credit access among women-owned manufacturing SMEs in Kenya.



## 2.6 Chapter Summary

This chapter reviewed the theoretical, and the empirical literature relating to credit access among women-owned SMEs. The review was anchored on the Theory of Planned Behavior and Information Asymmetry Theory, which together explain how behavioral perceptions and lender requirements influence financing decisions. The empirical review demonstrated that firm characteristics and collateral availability are important determinants of credit access, although findings vary across countries, sectors, and institutional contexts. The review further highlighted that firm size may influence how women-owned firms experience both perceived and actual financing constraints. While existing studies have examined collateral requirements, firm characteristics, and gender disparities in access to finance, limited evidence exists on the influence of credit perception on credit access among women-owned manufacturing SMEs in Kenya and whether these relationships vary by firm size. This gap provides the foundation for the research methodology presented in the next chapter.



## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The study employed a cross-sectional, explanatory research design. Since the dependent variable, credit access is binary, the study utilized a binary logistic regression model to estimate the likelihood that a woman-owned firm would apply for credit based on her credit perception, collateral availability and firm size.

### **3.2 Research Philosophy**

Research philosophy refers to the underlying beliefs and assumptions about how knowledge is created, understood, and communicated in a study (Creswell & Creswell 2018). The main philosophical paradigms include positivism, interpretivism, and pragmatism. Positivism assumes an objective reality that can be measured through empirical observation and statistical analysis to generate generalizable laws (Creswell & Creswell, 2018). Interpretivism, conversely, views reality as socially constructed and emphasizes understanding phenomena through participants' perspectives (Bryman, 2016). Pragmatism prioritizes practical outcomes over rigid adherence to any one philosophy (Morgan, 2014). This study adopted positivism as its underlying research philosophy.

Positivism is grounded in the belief that reality is objective, observable, and measurable through empirical methods. It holds that phenomena can be explained by laws and regularities discerned through scientific inquiry, particularly using quantifiable data and statistical techniques (Stace, 1944). In line with this, the study assumed that credit access, credit perception, firm size, and collateral availability are objective phenomena that could be measured and analyzed to establish causal relationships. The use of secondary data from the 2025 WBES supported this approach, as it allowed the examination patterns and test hypotheses in a structured, replicable manner.

Additionally, the study employed a deductive research approach, moving from established theoretical propositions to empirical testing. It was anchored in the Theory of Planned Behavior (Ajzen, 1991) and Information Asymmetry Theory. Consistent with the positivist paradigm, the study used a mono-method approach by relying solely on secondary data.

This minimized researcher bias and reinforces objectivity, which is critical for ensuring replicable and statistically sound outcomes.

### **3.3 Research Design**

This study adopted a cross-sectional quantitative research design, drawing on firm-level data from the 2025 WBES for Kenya. This design enables researchers to explore relationships among variables which is ideal for studies investigating causal and effect patterns (Kumar 2019). For this study, the design was well-suited to examine relationships between firm characteristics, demand driven factors and credit outcomes at a single point in time, particularly in the context of understanding both application behavior and perceived credit constraints among women-owned SMEs in the manufacturing sector.

### **3.4 Population and Sampling**

The study's population and sampling were as follows:

#### **3.4.1 Population of the study**

Saunders et al., (2009) defined a population as the full set from which a sample is drawn. The target population for this study comprised women-owned manufacturing SMEs operating in Kenya. The exact population of women-owned manufacturing firms in Kenya is not publicly available, however, the WBES sampling universe contained 3,251 manufacturing firms from which women owned firms were identified. This population included firms in the food manufacturing, chemicals and chemical products, and other manufacturing subsectors.

This study therefore relied on the World Bank Enterprise 2025 Survey data which captures a sample population of 161 women owned firms. These are firms that are formally registered businesses, engaged primarily in manufacturing activities, and where the top manager or principal owner identifies as female (World Bank, 2025). The focus on manufacturing reflects the sector's capital intensity and its critical role in Kenya's industrialization agenda (Government of Kenya, 2020), a sector which has seen a decline in growth from 7.3% in 2021 to 2.8% in 2024, while the emphasis on women-owned enterprises responds to persistent gender disparities in credit access (World Bank, 2020).

### **3.4.2 Sampling Procedure**

The study utilized secondary data drawn from the 2025 WBES for Kenya. The WBES applies a stratified random sampling methodology based on industry, firm size, and geographic location to ensure representativeness across the private sector (World Bank, 2025). This dataset remains the latest publicly available, nationally representative firm-level dataset containing information on gender, sector and financing behavior. The dataset covers formal, non-agricultural private sector firms and includes variables on firm characteristics, business environment constraints, and financial behaviors. From the full WBES sample, this study extracted a subset of manufacturing firms that are majority women-owned. The sample represented in the WBES data includes approximately 161 women-owned manufacturing firms from 8 regions (formally Provinces in Kenya). The filter was based on responses to questions about firm ownership, the gender of the top manager and the size based on the number of employees.

Three firms(1.9% of the sample) with missing data on key variables were excluded yielding a final analytical sample of 158 firms for the logistic regression analysis. This sample formed the basis for the analysis, aimed at analyzing the extent to which credit perception, collateral and firm size influence of credit application behavior, approval outcomes, and discouraged borrowing. Given the small proportion of excluded observations, the likelihood of substantial selection bias is considered minimal. However, formal statistical tests comparing included and excluded observations were not conducted, and this is acknowledged as a limitation of the study.

### **3.5 Data Collection Methods**

The study used secondary data from the most recent publicly available WBES dataset (2025) for Kenya which provides information on firms' decisions on whether to refrain or apply for credit. It also provided information on firms' perceptions based on their experience of credit access. This dataset has been widely used in the study of SMEs (Ng'ang'a 2015; Simba et al., 2024; Dutta & Mallick 2022). The survey is implemented using standardized questionnaires and administered through face-to-face interviews with business owners or top managers. The data is already cleaned, coded and validated by the

World Bank, making it reliable for empirical analysis. Relevant variables were extracted to match the operational definitions outlined in the conceptual framework.

### **3.6 Data Analysis**

Data analysis was done using Python software. The inferential analysis employed a binary logistic regression model to examine the relationship between credit perception, collateral and credit access, the moderating role of firm size was also analyzed. The dependent variable access to credit is dichotomous, coded as 1 if the firm applied for credit and 0 if it did not. This nature of the dependent variable justifies the use of a binary logistic regression model, which is appropriate when the outcome variable is binary and the predictors can be continuous, categorical, or both (Hosmer, Lemeshow, & Sturdivant, 2013). The model estimated the probability that a firm applies for credit as a function of its characteristics and other explanatory variables, making it suitable for evaluating the likelihood of credit access among women-owned manufacturing SMEs. Furthermore, logistic regression does not assume normality, linearity, or homoscedasticity of residuals, which makes it robust for analyzing cross-sectional survey data such as the WBES (Wooldridge, 2016). Independent variables are credit perception, based on whether access to finance is perceived as a “major” or “very severe” obstacle from WBES K30, firm size, categorized as small (5–19 employees), medium (20–99 employees), and asset ownership, was used as a proxy for collateral availability.

The control variables that were incorporated in the model included firm age, managerial experience, perceived corruption, quality certificate and training. Firm age was controlled for because older firms tend to possess longer credit histories, established business relationships, and greater reputational capital, which may reduce information asymmetry and improve access to external finance (Beck et al., 2006; Nguyen et al., 2022). Owner experience was included as a control variable because experienced business owners are more likely to possess the managerial and financial capabilities necessary to prepare loan applications, maintain lender relationships, and successfully secure financing (Cole & Mehran, 2009). Quality certification was included as a control variable because certification may signal operational reliability, compliance with recognized standards, and sound business practices to lenders, thereby reducing perceived default risk and

information asymmetry (Beck et al., 2006; Galli et al., 2020). Entrepreneurial training was included as a control variable because training can enhance financial literacy, record-keeping, and business planning capabilities, which improve a firm's preparedness to apply for and obtain credit from formal financial institutions (Simba et al., 2024; Nguyen et al., 2022). Corruption was included as a control variable because corruption-related barriers may increase transaction costs, uncertainty, and administrative burdens associated with obtaining credit, potentially limiting firms' access to credit (Beck et al., 2006).

### 3.6.1 Model Specification

This model specification was as follows:

**Direct effects;**  $\text{Ln}((P(Y=1)/(1-P(Y=1))) = \beta_0 + \beta_1.CP + \beta_2.COL + \beta_3.SIZE + \beta_4.Z$

**Moderation effects:**  $\text{Ln}((P(Y=1)/(1-P(Y_i=1))) = \beta_0 + \beta_1.CP + \beta_2.COL + \beta_3.SIZE + \beta_4*(CP \times SIZE) + \beta_5*(COL \times SIZE) + \beta_6.Z$

Where:

- $P(Y=1)$ : Firm's credit access
- CP: Credit Perception
- COL: Collateral Availability
- SIZE: Firm Size
- Z = Control variables (Firm Age, Experience, Perceived Corruption, Training, Quality Certificate)
- $\beta_0 \dots \beta_5$  = Coefficients

### 3.6.2 Data Analysis Procedure

The analysis began with demographic characteristics to summarize the characteristics of the sampled firms, including ownership structure, firm size and legal status. Frequencies, means, standard deviations, kurtosis and skewness were used to summarize and give descriptive statistics of the variables. Next, correlation analysis was carried out to examine preliminary relationships among the variables and to check for potential multicollinearity. Several diagnostic tests were undertaken to ensure the validity and robustness of the regression results. Multicollinearity among independent variables was assessed using the

Variance Inflation Factor (VIF), with values above 10 indicating high correlation (Gujarati & Porter, 2009). The Box–Tidwell test was applied to confirm the linearity of continuous predictors with the logit of the dependent variable (Hosmer et al., 2013). Heteroskedasticity was tested using the Breusch–Pagan and White tests, and robust standard errors was applied where necessary (Wooldridge, 2016). Outliers and influential cases were identified using standardized residuals, Cook’s Distance, and leverage statistics (Field, 2018). Model adequacy was evaluated through the Hosmer–Lemeshow goodness-of-fit test, Likelihood-Ratio Chi-square test, and Pseudo R<sup>2</sup> statistics, while predictive accuracy was examined using the Receiver Operating Characteristic (ROC) curve and Area Under the Curve (AUC) values (Hair, Black, Babin, & Anderson, 2020). Finally, the Linktest was used to detect specification errors (Long & Freese, 2014). These diagnostics ensure that the binary logistic regression model is statistically sound and appropriate for analyzing cross-sectional data.

### **3.7 Research Quality**

This study emphasized on key dimensions of research quality, namely validity, reliability, and robustness. Construct validity was supported using well-established indicators from the WBES, which have been widely used in empirical studies on SME finance and credit constraints (Galli et al., 2020; Dutta & Mallick.,2022; Simba et al., 2024). All variables were directly extracted from the WBES questionnaire, reducing the risk of measurement bias. Internal validity is strengthened by the inclusion of relevant control variables which help to isolate the effects of the key predictors on credit outcomes. Furthermore, interaction term is included to capture conditional effects and reduce omitted variable bias. Data reliability was ensured through consistent coding procedures and data cleaning protocols employed by World Bank. The use of a large, standardized dataset collected using a stratified random sampling methodology enhances the reproducibility of the study. Model robustness was addressed through diagnostic checks, including multicollinearity testing via Variance Inflation Factors (VIFs), and model fit evaluation using the Likelihood Ratio Test and McFadden’s Pseudo R-squared. These measures ensured that the model’s explanatory power and specification are sound and grounded in econometric best practices (Gujarati & Porter, 2009; Long & Freese, 2014).

### **3.8 Ethical Issues in Research**

As the study relied on secondary data from the WBES which is a publicly available and anonymized source. The World Bank follows ethical research standards in its data collection, including informed consent and confidentiality. The study adhered to the principle of responsible data use, and no identifiable information was disclosed. Ethical clearance for the use of secondary data was sought in line with Strathmore and the National Commission for Science, Technology and Innovation (NACOSTI) requirements.

### **3.9 Chapter Summary**

This chapter outlined the research methodology adopted to examine the drivers of credit access among women-owned manufacturing SMEs in Kenya. The study was grounded in a positivist research philosophy and employed a deductive approach, drawing on the Theory of Planned Behavior and Information Asymmetry Theory to guide hypothesis testing. A cross-sectional explanatory design was utilized, relying on secondary data from the 2025 World Bank Enterprise Survey (WBES). The target population comprised women-owned manufacturing SMEs in Kenya, with a final analytical sample drawn from the stratified WBES dataset. Data analysis was conducted using binary logistic regression, appropriate for the dichotomous dependent variable measuring credit access. Both direct and moderation models were specified to assess the influence of credit perception, collateral availability, and firm size, while controlling for firm age, experience, corruption, training, and quality certification. Comprehensive diagnostic tests including multicollinearity checks, goodness-of-fit tests, linearity assessments, and influence diagnostics were performed to ensure robustness. The chapter also addressed issues of validity, reliability and ethical compliance, confirming that the study adhered to rigorous methodological and ethical standards.

## CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

### 4.1 Introduction

This chapter presents the data analysis, empirical results and interpretation of findings on the drivers of credit access among women-owned manufacturing small and medium enterprises (SMEs) in Kenya, with particular emphasis on the moderating role of firm size. The chapter begins with descriptive and diagnostic analyses to establish the suitability of the data for econometric modelling. It then reports the results of the binary logistic regression model estimated to examine the influence of credit perception and collateral availability on credit access, while accounting for firm-specific characteristics. The findings are interpreted in relation to the study objectives and existing empirical literature, providing a basis for policy-relevant conclusions.

### 4.2 Demographic Characteristics

This section presents the demographic characteristics of the sampled women-owned manufacturing SMEs in Kenya. The demographic analysis provides important background information on the structure and distribution of the enterprises included in the study. Specifically, the section examines the size of the SMEs, their geographical location, and their legal status. Understanding these characteristics is essential, as they shape firms' operational environments and may influence access to credit. Tables 4.1, 4.2, and 4.3 summarize the distribution of SMEs by size, location, and legal form, respectively, and form the basis for the subsequent detailed discussion.

**Table 4.1: SME Size**

| <b>SME size</b> | <b>count</b> | <b>percentage</b> |
|-----------------|--------------|-------------------|
| Small           | 97           | 60.248            |
| Medium          | 64           | 39.752            |
|                 | 161          | 100               |

Table 4.1 presents the distribution of the sampled women-owned manufacturing SMEs by firm size. The results indicate that the majority of the enterprises are small-sized firms, accounting for 97 SMEs (60.25%), while 64 firms (39.75%) fall within the medium-sized category. This distribution reflects the typical structure of the Kenyan SME landscape,

where small enterprises dominate numerically and constitute the backbone of private sector activity (KNBS, 2016). The predominance of small firms is particularly important for this study because empirical evidence consistently shows that smaller enterprises face more severe constraints in accessing formal credit, largely due to information opacity, limited documentation and weaker credit histories that elevate lender uncertainty (Beck et al., 2006; Berger et al., 2007). In manufacturing specifically, this disadvantage is often amplified by the sector's capital intensity and lenders' tendency to rely heavily on collateral-based lending practices, which structurally exclude firms with limited asset bases (Rahman et al., 2017; Simba et al., 2024).

Moreover, small firms especially women-owned are more likely to face collateral-related barriers given gendered asset ownership patterns that restrict women's control over land and other high-value property, thereby reducing their capacity to meet standard lending conditions (Brixiová et al., 2020; FSD Kenya, 2022). This situation is compounded by the fact that women entrepreneurs are frequently discouraged borrowers: even when they require financing, they may self-exclude from formal credit markets due to perceived low chances of approval or negative prior experiences with lending institutions (Galli et al., 2020; Morsy et al., 2019; Naegels et al., 2018). Consequently, the dominance of small firms in the sample underscores the relevance of examining both structural constraints (such as collateral availability) and behavioral constraints (credit perception), which the literature identifies as particularly binding for women-owned enterprises.

Conversely, the relatively substantial share of medium-sized firms (39.75%) suggests the presence of enterprises with comparatively stronger organizational capacity, more established operational histories, and potentially better asset endowments; factors that are generally associated with improved ability to access external finance (Beck et al., 2006; Quartey et al., 2017). Larger firms are also more likely to reduce information asymmetries through better record-keeping and formalized governance structures, which can enhance their credibility and bargaining power with lenders (Berger et al., 2007). However, evidence also cautions that firm growth does not uniformly eliminate financing constraints for women-owned businesses, as perceived barriers can persist even when objective firm characteristics improve (Hansen & Rand, 2014).

**Table 4.2: SME Location**

| <b>SME location</b>   | <b>count</b> | <b>percentage</b> |
|-----------------------|--------------|-------------------|
| Nairobi               | 47           | 29.193            |
| Nyanza and Western    | 27           | 16.770            |
| Central               | 25           | 15.528            |
| Rift Valley           | 23           | 14.286            |
| East and Northeastern | 21           | 13.043            |
| Coast                 | 18           | 11.180            |
|                       | 161          | 100               |

Table 4.2 presents the geographical distribution of the sampled women-owned manufacturing SMEs across different regions of Kenya. The results indicate that Nairobi hosts the largest proportion of firms, with 47 SMEs (29.19%), reflecting its position as the country's primary commercial, industrial and financial hub. This concentration is consistent with national evidence showing that manufacturing activity, financial institutions and business support services are heavily clustered in Nairobi, giving firms located there relatively greater exposure to formal credit markets (KNBS, 2016; Mugenyi et al., 2020). Empirical studies suggest that proximity to banks and microfinance institutions lowers transaction costs, reduces information asymmetry and increases the likelihood of loan applications and approvals, particularly for SMEs operating in capital-intensive sectors such as manufacturing (Beck et al., 2006; Berger et al., 2007).

For women-owned enterprises, access to dense financial networks may also mitigate some behavioral barriers, as frequent interaction with financial institutions can improve familiarity with loan procedures and reduce discouragement associated with perceived rejection (Naegels et al., 2018; Morsy et al., 2019). However, despite Nairobi's relatively favorable financial ecosystem, prior empirical evidence cautions that women-owned firms do not automatically translate spatial advantages into improved credit access. FSD Kenya (2022, 2024) reports that even in urban centers with high financial penetration, women entrepreneurs continue to rely disproportionately on informal finance due to collateral constraints, complex loan procedures, and negative credit perceptions. Similarly, Mwirigi et al. (2021) found that women-owned SMEs in Nairobi still face stringent collateral requirements and high costs of perfecting collateral, limiting their effective participation

in formal credit markets. This suggests that while location in Nairobi may reduce structural barriers related to access and proximity, gendered and behavioral constraints remain salient.

The remaining SMEs are relatively evenly distributed across Nyanza and Western (16.77%), Central (15.53%), Rift Valley (14.29%), Eastern and Northeastern (13.04%), and the Coast region (11.18%). This wide regional spread indicates that women-owned manufacturing SMEs operate within heterogeneous economic, infrastructural and institutional contexts. Empirical literature highlights those regional disparities in financial inclusion, infrastructure quality and economic development significantly shape SMEs' access to finance, with firms in less urbanized or economically vibrant regions facing higher transaction costs and fewer formal lending opportunities (Beck & Demirgüç-Kunt, 2006; Quartey et al., 2017). In Kenya, Ng'ang'a (2015) and FSD Kenya (2023) document that SMEs outside major urban centers often experience weaker relationships with formal financial institutions and greater reliance on informal networks, which can constrain loan size and limit long-term growth.

From a gender perspective, these regional differences may further intensify credit access challenges for women-owned firms. Studies from Sub-Saharan Africa show that women entrepreneurs operating in peripheral or rural regions are more likely to be discouraged borrowers, as limited institutional presence and opaque lending processes heighten perceptions of exclusion (Galli et al., 2020; Naegels et al., 2018). Consequently, geographical location interacts with both structural factors, such as the availability of financial institutions and behavioral factors, such as credit perception, to shape credit-seeking behavior among women-owned SMEs.

**Table 4.3: SME Legal Status**

| <b>SME legal status</b> | <b>count</b> | <b>percentage</b> |
|-------------------------|--------------|-------------------|
| Sole proprietorship     | 57           | 35.404            |
| Limited partnership     | 57           | 35.404            |
| Partnership             | 26           | 16.149            |
| Private companies       | 21           | 13.043            |
|                         | 161          | 100               |

Table 4.3 presents the distribution of the sampled women-owned manufacturing SMEs by legal status. The results show that sole proprietorships and limited partnerships are the dominant legal forms, each accounting for 57 firms (35.40%). This pattern suggests that a substantial proportion of women-owned manufacturing SMEs operate under relatively simple ownership and governance structures. Empirical evidence indicates that such legal forms are often preferred by women entrepreneurs due to their low registration costs, minimal regulatory requirements and greater managerial autonomy (Marlow & Carter, 2004; FSD Kenya, 2022). However, while these structures are easier to establish, they typically provide limited legal separation between the owner and the business, which can expose owners to personal liability and weaken the firm's institutional profile in the eyes of formal lenders.

Partnerships account for 26 firms (16.15%), while private companies constitute the smallest share at 21 firms (13.04%). This distribution is consistent with findings from Kenya and other developing economies showing that women-owned SMEs are less likely to adopt more formal corporate structures compared to male-owned firms, often due to higher compliance costs, complex reporting requirements and limited access to professional advisory services (Ng'ang'a, 2015; Mwirigi et al., 2021). From a credit access perspective, legal status is a critical structural characteristic because it shapes lenders' assessment of risk, transparency, and enforceability of contracts. Beck et al. (2006) and Berger et al. (2007) demonstrate that formally incorporated firms are more likely to access bank credit due to better record-keeping, clearer ownership structures, and stronger legal protections, all of which reduce information asymmetry between borrowers and lenders.

For women-owned enterprises, the dominance of sole proprietorships and partnerships may therefore translate into heightened credit constraints. Studies in Kenya and Sub-Saharan Africa show that lenders often perceive unincorporated firms as riskier due to weaker governance structures, informality and limited documentation, leading to stricter collateral requirements or outright exclusion from formal credit markets (Bellucci et al., 2010; FSD Kenya, 2023). Mwirigi et al. (2021) further found that women entrepreneurs operating as sole proprietors face greater difficulties in meeting collateral and documentation requirements, reinforcing both actual and perceived barriers to credit access. These

structural disadvantages may also interact with behavioural factors, such as credit perception, increasing the likelihood of self-exclusion from formal lending channels (Naegels et al., 2018; Morsy et al., 2019).

Although private companies represent the smallest proportion of the sample, their presence is important for this study. Empirical literature suggests that incorporated firms are better positioned to signal creditworthiness through formal financial statements, audited accounts and clearer asset ownership, which can improve access to external finance (Beck & Demirgüç-Kunt, 2006; Rahman et al., 2017). In the Kenyan manufacturing context, Ng'ang'a (2015) found that registered and incorporated firms are significantly more likely to access formal credit than informal or semi-formal enterprises. However, Mugenyi et al. (2020) caution that even when women-owned firms adopt more formal legal structures, gendered constraints related to collateral ownership and lender bias may persist, limiting the full benefits of incorporation.

#### 4.3 Descriptive Statistics

This section presents the descriptive statistics of the key variables used in the empirical analysis of credit access among women-owned manufacturing SMEs in Kenya. The descriptive statistics provide a summary of the central tendencies, dispersion, and distributional properties of the study variables, including the dependent variable, core explanatory variables, and selected firm characteristics. Table 4.4 reports the count, mean, standard deviation, skewness, and kurtosis for each variable, offering important insights into the nature of the data and informing the subsequent econometric analysis and interpretation of results.

**Table 4.4: Descriptive Statistics**

|                               | count | mean   | std    | skewness | kurtosis |
|-------------------------------|-------|--------|--------|----------|----------|
| Credit Access (Y)             | 161   | 0.547  | 0.499  | -0.189   | -1.989   |
| Credit Perception (CP)        | 161   | 0.311  | 0.464  | 0.827    | -1.334   |
| Collateral Availability (COL) | 161   | 7.286  | 8.997  | 0.487    | -1.644   |
| Firm Size (Employees)         | 161   | 31.186 | 49.832 | 3.59     | 15.025   |
| Firm Age                      | 161   | 17.168 | 15.720 | 3.597    | 20.609   |
| Corruption (Obstacle)         | 161   | 2.019  | 1.468  | -0.033   | -1.402   |
| Experience (Years)            | 161   | 19.739 | 10.598 | 0.975    | 2.166    |

|                     |     |       |       |       |        |
|---------------------|-----|-------|-------|-------|--------|
| Quality Certificate | 158 | 0.089 | 0.285 | 2.923 | 6.629  |
| Training            | 161 | 0.410 | 0.493 | 0.370 | -1.887 |

Table 4.4 presents the descriptive statistics of the key variables used to examine the drivers of credit access among women-owned manufacturing SMEs in Kenya. By reporting the count, mean, standard deviation, skewness and kurtosis, the table provides insight into the central tendency, variability and distributional properties of the study variables, which is essential for contextualizing subsequent econometric analysis (Gujarati & Porter, 2009). The dependent variable, credit access (Y), has a mean of 0.5466, indicating that approximately 54.7 per cent of the sampled women-owned manufacturing SMEs had access to credit. This level of access is relatively high compared to national and regional estimates, which often report lower formal credit uptake among women-owned enterprises (Data2X, 2019; FSD Kenya, 2024).

However, this finding is consistent with evidence that manufacturing firms, due to their capital-intensive nature, are more likely to seek and sometimes secure external finance than firms in less capital-demanding sectors (Beck et al., 2006; Mugenyi et al., 2020). The standard deviation of 0.4994 reflects the binary nature of the variable, while the slight negative skewness (−0.1889) suggests a marginally higher concentration of firms with access to credit. The negative kurtosis (−1.9892) implies a relatively flat distribution, indicating a balanced representation of firms with and without credit access, which aligns with prior WBES-based studies on SME financing behavior (Galli et al., 2020; Simba et al., 2024).

Credit perception (CP) records a mean of 0.3106, implying that about 31.1 per cent of the firms reported unfavorable perceptions regarding access to credit, such as fear of rejection, unfavorable lending terms, or complex application procedures. This finding corroborates empirical evidence showing that a substantial share of women entrepreneurs self-excludes from formal credit markets due to negative expectations and perceived institutional barriers (Naegels et al., 2018; Morsy et al., 2019; Dutta & Mallick, 2022). The positive skewness (0.8265) suggests that most firms report relatively low levels of discouragement, with fewer firms experiencing severe negative perceptions. The low kurtosis (−1.3336) indicates

a moderately dispersed distribution, supporting the argument that credit perception varies considerably across women-owned firms, even within the same sector and country (Simba et al., 2024).

Collateral availability (COL) has a mean value of 7.2861, accompanied by a relatively large standard deviation of 8.9966, indicating substantial variation in asset ownership among the sampled firms. The positive skewness (0.487) suggests that while most women-owned manufacturing SMEs possess limited collateral, a small number hold relatively high levels of assets. This pattern is consistent with extensive literature documenting unequal asset ownership among women entrepreneurs due to legal, cultural, and economic constraints (Brixiová et al., 2020; FSD Kenya, 2022). Empirical studies further show that such disparities in collateral availability significantly influence both actual credit access and perceptions of creditworthiness, often discouraging women from applying for formal loans (Bellucci et al., 2010; Simba et al., 2024).

Firm size, measured by the number of employees, has a mean of 31.19 employees and a high standard deviation of 49.83, indicating considerable heterogeneity in firm scale. The strong positive skewness (3.59) and high kurtosis (15.02) reveal the presence of a few relatively large firms within a sample dominated by small and medium enterprises. This distributional pattern mirrors findings from Kenya and other developing economies, where SME populations are heavily skewed toward smaller firms (KNBS, 2016; Tiriongo et al., 2025). The pronounced heterogeneity in firm size supports the relevance of examining firm size as a moderating factor, as prior studies show that larger firms tend to have better access to finance due to stronger asset bases, formalization, and reduced information asymmetry, although these advantages may not fully accrue to women-owned firms (Beck et al., 2006; Hansen & Rand, 2014).

Firm age averages approximately 17.17 years, with a standard deviation of 15.72, indicating wide variation in business maturity. The highly positive skewness (3.60) and elevated kurtosis (20.61) suggest that while most firms are relatively young, a small number of much older firms exist in the sample. Empirical evidence suggests that older firms benefit from longer banking relationships, accumulated reputation and improved

record-keeping, which can enhance access to credit by reducing lenders' uncertainty (Rahman et al., 2017; Ng'ang'a, 2015). However, studies focusing on women-owned enterprises caution that longevity alone may not fully offset gender-related constraints in asset ownership and lender perceptions (Mwirigi et al., 2021; Morazzoni & Sy, 2022).

The variable capturing corruption as an obstacle has a mean of 2.02, indicating that, on average, firms perceive corruption as a moderate constraint. The near-zero skewness (−0.0326) suggests a fairly symmetric distribution of perceptions, while the negative kurtosis (−1.402) implies a relatively flat distribution across response categories. This finding aligns with Kenyan and regional studies showing that corruption is widely perceived as a systemic barrier affecting SMEs' interaction with public institutions and financial markets, often increasing transaction costs and discouraging formal engagement (Beck & Demirgüç-Kunt, 2006; FSD Kenya, 2023). Statnik et al. (2023) further note that women entrepreneurs may be particularly discouraged by corruption, reinforcing self-exclusion from formal credit channels.

Experience, measured in years of managerial experience, records a mean of 19.74 years with a standard deviation of 10.60, suggesting that most women entrepreneurs in the sample possess substantial business experience. The positive skewness (0.9752) indicates that fewer firms have exceptionally high experience levels, while the kurtosis (2.17) suggests moderate clustering around the mean. Prior empirical studies find that managerial experience enhances financial literacy, improves interactions with lenders, and positively influences credit access by signaling competence and reliability (Ng'ang'a, 2015; Mwirigi et al., 2021). Nevertheless, evidence also suggests that experience alone may not fully overcome structural barriers such as collateral constraints and gender bias (Morazzoni & Sy, 2022).

The proportion of firms holding a quality certificate is notably low, with a mean of 0.0886, indicating that only about 8.9 per cent of the sampled women-owned manufacturing SMEs possess formal quality certification. The high positive skewness (2.92) and kurtosis (6.63) reflect the rarity of certification within the sample. This finding is consistent with studies showing that certification and formal accreditation are less common among SMEs due to

cost, complexity, and limited awareness, particularly among women-owned firms (Simba et al., 2024; Mugenyi et al., 2020). Since quality certification can serve as a signal of credibility and operational standards, its low prevalence may constrain perceived creditworthiness and access to formal finance (Beck et al., 2006).

Finally, training has a mean of 0.4099, indicating that approximately 41.0 per cent of the firms have participated in formal training programmes. The moderate standard deviation (0.4934) and slight positive skewness (0.3697) suggest a fairly balanced distribution between trained and untrained firms, with slightly more firms lacking formal training. Empirical evidence from Kenya and other African contexts indicates that training enhances managerial capacity, financial literacy, and awareness of lending procedures, which can positively influence both credit perception and actual access to finance (Simba et al., 2024; Mdoe & Kinyanjui, 2018). However, the substantial share of firms without formal training underscores persistent capability gaps that may reinforce behavioral and structural barriers to credit access among women-owned manufacturing SMEs.

#### **4.4 Correlation Analysis**

This section presents the correlation analysis of the key variables used in the study to examine the drivers of credit access among women-owned manufacturing SMEs in Kenya. The correlation analysis provides preliminary insights into the direction and strength of the relationships between credit access, credit perception, collateral availability, firm size and selected control variables. Table 4.5 reports the pairwise correlation coefficients, which help to identify potential associations among the variables and to assess the presence of multicollinearity prior to econometric estimation.

**Table 4.5: Correlation Analysis**

|                       | <b>Credit Access</b> | <b>CP</b> | <b>COL Index</b> | <b>Size</b> | <b>Experience Years</b> | <b>Firm Age</b> | <b>Corruption Obstacle</b> | <b>Quality Certification</b> | <b>Training</b> |
|-----------------------|----------------------|-----------|------------------|-------------|-------------------------|-----------------|----------------------------|------------------------------|-----------------|
| Credit Access         | 1.000                | -0.359*** | 0.740***         | 0.158**     | 0.007                   | -0.009          | 0.174**                    | 0.106                        | -0.027          |
| CP                    | -0.359***            | 1.000     | -0.234***        | -0.147*     | 0.013                   | 0.001           | 0.010                      | -0.065                       | -0.041          |
| COL Index             | 0.740***             | -0.234*** | 1.000            | 0.247***    | 0.032                   | -0.019          | 0.134*                     | 0.210***                     | 0.152*          |
| Size                  | 0.158**              | -0.147*   | 0.247***         | 1.000       | 0.168**                 | 0.243***        | -0.021                     | 0.256***                     | 0.287***        |
| Experience Years      | 0.007                | 0.013     | 0.032            | 0.168**     | 1.000                   | 0.548***        | -0.091                     | 0.182**                      | 0.126           |
| Firm Age              | -0.009               | 0.001     | -0.019           | 0.243***    | 0.548***                | 1.000           | -0.069                     | 0.136*                       | 0.099           |
| Corruption Obstacle   | 0.174**              | 0.010     | 0.134*           | -0.021      | -0.091                  | -0.069          | 1.000                      | 0.120                        | -0.114          |
| Quality Certification | 0.106                | -0.065    | 0.210***         | 0.256***    | 0.182**                 | 0.136*          | 0.120                      | 1.000                        | 0.151*          |
| Training              | -0.027               | -0.041    | 0.152*           | 0.287***    | 0.126                   | 0.099           | -0.114                     | 0.151*                       | 1.000           |

Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Table 4.5 presents the correlation analysis between credit access and the key explanatory and control variables included in the study. The correlation results provide preliminary insights into the direction, strength, and statistical significance of the relationships among the variables prior to multivariate estimation and help assess their suitability for inclusion in the regression models (Gujarati & Porter, 2009). While correlation does not imply causality, these bivariate relationships provide useful evidence regarding the factors associated with credit access among women-owned manufacturing SMEs in Kenya.

The results indicate a moderate and statistically significant negative correlation between credit access and credit perception ( $r = -0.359$ ,  $p < 0.01$ ), suggesting that unfavorable perceptions about credit, such as fear of rejection, high interest rates, or stringent lending conditions, are associated with lower levels of credit access among women-owned manufacturing SMEs.

This finding aligns strongly with demand-side explanations in the literature, which emphasize that negative credit perceptions often lead to self-exclusion from formal credit markets, even when firms may be objectively eligible for loans (Naegels et al., 2018; Morsy et al., 2019; Galli et al., 2020). Similar evidence using World Bank Enterprise Survey data shows that women entrepreneurs who perceive access to finance as a major obstacle are significantly less likely to apply for or obtain formal credit (Dutta & Mallick, 2022; Simba et al., 2024). The observed negative and statistically significant association therefore provides strong preliminary empirical support for the first objective of the study and reinforces the relevance of behavioral factors, as emphasized by the Theory of Planned Behavior, in shaping credit-seeking behavior among women-owned firms (Ajzen, 1991; Ključnikov et al., 2025).

In contrast, collateral availability (COL index) exhibits a strong positive and highly significant correlation with credit access ( $r = 0.740$ ,  $p < 0.01$ ), indicating that women-owned manufacturing SMEs with greater collateral capacity are substantially more likely to access formal credit. This strong association is consistent with a large body of empirical literature identifying collateral as a central determinant of credit access, particularly in developing-country contexts characterized by information asymmetry (Beck et al., 2006; Rahman et al., 2017). Studies focusing on women-owned firms further demonstrate that limited asset ownership significantly constrains their ability to meet collateral requirements, thereby reducing both actual access to credit and confidence in applying for loans (Bellucci et al., 2010; Brixiová et al., 2020; Simba et al., 2024). However, the magnitude of this correlation warrants cautious interpretation. First, it may partly reflect measurement overlap, given that the WBES collateral proxy is closely related to financing structure, which may be linked to the credit access outcome. Second, potential endogeneity cannot be ruled out, as firms that successfully access credit may subsequently accumulate assets, thereby strengthening their collateral position through reverse causality. Nonetheless, the highly significant relationship underscores the structural importance of collateral in the Kenyan credit market and provides strong preliminary support for the second objective of the study.

Firm size (SIZE) shows a positive and statistically significant correlation with credit access ( $r = 0.158$ ,  $p < 0.05$ ), suggesting that larger women-owned manufacturing SMEs tend to have slightly better access to credit than smaller firms. This finding is consistent with prior studies showing that firm size is positively associated with access to finance due to greater asset bases, formalization, and reduced information asymmetry (Beck et al., 2006; Quartey et al., 2017; Ng'ang'a, 2015). Importantly, firm size is positively and significantly correlated with collateral availability ( $r = 0.247$ ,  $p < 0.01$ ), quality certification ( $r = 0.256$ ,  $p < 0.01$ ), and training ( $r = 0.287$ ,  $p < 0.01$ ). These relationships suggest that larger firms are more likely to accumulate assets, adopt formal standards, and invest in capacity-building initiatives, which collectively enhance their perceived and actual creditworthiness (Canton et al., 2013; Tiriongo et al., 2025). This pattern supports the conceptualization of firm size as a moderating variable rather than a purely direct determinant of credit access.

The correlation between experience years and firm age is relatively high and statistically significant ( $r = 0.548$ ,  $p < 0.01$ ), reflecting the expected relationship between managerial experience and the length of time a firm has been in operation. This association is consistent with empirical evidence suggesting that older firms tend to be managed by more experienced entrepreneurs and benefit from longer relationships with financial institutions (Rahman et al., 2017; Ng'ang'a, 2015). However, the correlation remains below commonly accepted thresholds for multicollinearity, indicating that both variables can be included in the regression models without serious econometric concern (Gujarati & Porter, 2009). Prior studies similarly include both firm age and managerial experience to capture distinct but related dimensions of firm maturity and human capital (Simba et al., 2024).

The variable capturing corruption as an obstacle shows a weak but statistically significant positive correlation with credit access ( $r = 0.174$ ,  $p < 0.05$ ), suggesting that firms that engage with formal credit markets may also be more exposed to institutional and bureaucratic challenges. This finding is consistent with evidence that more formalized firms, which are more likely to seek bank financing, also interact more frequently with regulatory and administrative systems where corruption may be encountered (Beck & Demirgüç-Kunt, 2006; FSD Kenya, 2023). However, the relatively small magnitude of the correlation implies that corruption is not a dominant factor influencing credit access at the

bivariate level, echoing findings from Kenya and other Sub-Saharan African contexts where corruption tends to operate indirectly through increased transaction costs rather than as a direct determinant of loan approval (Statnik et al., 2023).

The possession of a quality certificate is positively correlated with credit access ( $r = 0.106$ ), while training exhibits a negligible negative correlation ( $r = -0.027$ ). However, neither relationship is statistically significant ( $p > 0.10$ ), suggesting that quality certification and training do not have a meaningful direct association with credit access at the bivariate level. This finding implies that any influence these factors may exert on credit access is likely indirect and mediated through other firm characteristics such as firm size, collateral availability, or operational formalization. Similarly, the correlations between credit access and experience years ( $r = 0.007$ ) and firm age ( $r = -0.009$ ) are statistically insignificant, indicating that these factors do not independently explain variations in credit access among women-owned manufacturing SMEs at the correlation stage.

#### **4.5 Diagnostic Tests**

This section presents the diagnostic tests conducted to assess the validity, reliability, and robustness of the econometric models estimated in the study. The diagnostics are essential for confirming that the assumptions underlying the logistic regression framework are reasonably satisfied and that the estimated results are not driven by model misspecification or data anomalies. Specifically, the section discusses tests for multicollinearity using the Variance Inflation Factor (VIF), model goodness-of-fit, linearity of continuous variables in the logit, and potential specification errors. In addition, outliers and influential observations are examined to ensure that the findings are not unduly influenced by extreme cases. Tables 4.6 to 4.10 present the results of these diagnostic tests and provide a basis for evaluating the adequacy of the models used in the analysis.

##### **4.5.1 Multicollinearity Test**

This subsection examines the presence of multicollinearity among the explanatory variables included in the regression models. Multicollinearity arises when two or more independent variables are highly correlated, which can distort coefficient estimates and undermine the reliability of the estimated relationships. To assess this potential problem,

the Variance Inflation Factor (VIF) is employed as a standard diagnostic measure. Table 4.6 presents the VIF values for all explanatory variables used in the analysis and provides evidence on whether multicollinearity poses a concern for the estimation and interpretation of the regression results.

**Table 4.6: Multicollinearity Test**

| Variable            | VIF   |
|---------------------|-------|
| const               | 8.443 |
| CP                  | 1.080 |
| COL_index           | 1.185 |
| Size                | 1.258 |
| Experience years    | 1.462 |
| Firm age            | 1.486 |
| Corruption obstacle | 1.055 |
| Quality certificate | 1.146 |
| Training            | 1.129 |

Table 4.6 presents the Variance Inflation Factor (VIF) values for the explanatory variables included in the regression models used to examine the drivers of credit access among women-owned manufacturing SMEs in Kenya. The VIF diagnostic is employed to assess the extent of multicollinearity among the independent variables, which, if severe, can inflate standard errors, reduce statistical power, and compromise the reliability and interpretability of coefficient estimates (Gujarati & Porter, 2009; Wooldridge, 2016). Assessing multicollinearity is particularly important in models that include interaction terms and conceptually related firm characteristics, as is the case in this study.

The results indicate that all explanatory variables have VIF values well below the commonly accepted threshold of 10, and even below the more conservative cut-off of 5 suggested in applied econometric literature, indicating the absence of serious multicollinearity in the models (Gujarati & Porter, 2009). Specifically, the VIF values for the key explanatory variables credit perception (CP) and collateral availability (COL\_index) are 1.08 and 1.19, respectively, suggesting very low linear association with other regressors. This finding supports the empirical strategy adopted in previous studies that jointly examine behavioral factors, such as perceived credit constraints, and structural

factors, such as collateral availability, without encountering multicollinearity concerns (Dutta & Mallick, 2022; Simba et al., 2024).

Firm size (SIZE) records a VIF of 1.26, further confirming that it is not excessively correlated with other explanatory variables and can be reliably included in the model as both a direct predictor and a moderating variable. This is consistent with empirical studies that treat firm size as a distinct construct capturing scale, bargaining power, and information transparency, rather than as a proxy for other firm characteristics (Beck et al., 2006; Canton et al., 2013; Quartey et al., 2017). The low VIF associated with firm size is particularly important given the study's focus on testing interaction effects between firm size and key drivers of credit access, as high multicollinearity could otherwise obscure moderation effects.

The control variables including experience years, firm age, perceived corruption, quality certification and training also exhibit low VIF values ranging between 1.06 and 1.49. Although firm age and experience years display slightly higher VIF values relative to other variables, they remain far below critical levels and therefore do not pose a multicollinearity concern. This pattern is expected, as prior literature acknowledges a natural association between firm age and managerial experience, while still treating them as conceptually distinct dimensions of firm maturity and human capital (Ng'ang'a, 2015; Rahman et al., 2017; Simba et al., 2024). Similar studies using World Bank Enterprise Survey data have successfully included both variables in multivariate models without compromising estimation reliability (Beck et al., 2006; Dutta & Mallick, 2022).

#### **4.5.2 Hosmer–Lemeshow Goodness-of-Fit Test**

This subsection assesses the overall goodness-of-fit of the logistic regression model estimated in the study. The Hosmer–Lemeshow (H–L) goodness-of-fit test is commonly used to evaluate how well the predicted probabilities from a logistic regression model correspond to the observed outcomes. The test compares observed and expected frequencies of the dependent variable across groups of predicted risk. Table 4.7 presents the results of the Hosmer–Lemeshow test and provides evidence on whether the estimated

model adequately fits the data used to analyze credit access among women-owned manufacturing SMEs in Kenya.

**Table 4.7: Hosmer–Lemeshow Goodness-of-Fit Test**

| <b>Statistic</b> | <b>Value</b> |
|------------------|--------------|
| HL_stat          | 2.877        |
| HL_df            | 5            |
| HL_p             | 0.719        |
| AUC              | 0.956        |

Table 4.7 reports the results of the Hosmer–Lemeshow (H–L) goodness-of-fit test together with the Area Under the Receiver Operating Characteristic Curve (AUC) for the estimated logistic regression model examining credit access among women-owned manufacturing SMEs in Kenya. The Hosmer–Lemeshow test yields a chi-square statistic of 2.88 with 5 degrees of freedom and a p-value of 0.719. Since the p-value is well above the conventional 5 per cent significance level, the null hypothesis that there is no difference between observed and predicted probabilities cannot be rejected. This indicates that the model fits the data adequately and that the predicted probabilities of credit access are consistent with the observed outcomes across different risk groups. In applied credit access studies using binary choice models, a non-significant H–L statistic is widely interpreted as evidence of good model calibration and internal validity (Hosmer et al., 2013; Wooldridge, 2016).

The adequacy of model fit observed in this study is consistent with prior empirical work that applies logistic regression to World Bank Enterprise Survey data to model firms’ access to finance. Studies by Beck et al. (2006), Galli et al. (2020), and Simba et al. (2024) similarly report satisfactory goodness-of-fit statistics when explaining credit access using firm-level characteristics, collateral availability, and perceived financing constraints. In particular, Galli et al. (2020) emphasize that models incorporating both demand-side behavioral factors and structural constraints tend to exhibit better fit than those focusing solely on supply-side determinants. The present findings therefore lend empirical support to the study’s conceptual framework, which integrates credit perception and collateral availability, alongside firm size, in explaining credit access among women-owned manufacturing SMEs.

In addition, the AUC value of 0.956 indicates excellent discriminatory power of the model. The AUC measures the ability of the model to correctly distinguish between firms that accessed credit and those that did not across all possible probability thresholds. An AUC value above 0.90 is generally regarded as outstanding in applied microeconomic and credit risk modeling contexts, signaling very high predictive accuracy (Hosmer et al., 2013). This result suggests that the combination of behavioral variables, such as credit perception, and structural variables, such as collateral availability and firm size, provides a strong basis for differentiating between credit-constrained and non-constrained women-owned manufacturing SMEs.

The exceptionally high AUC observed aligns with empirical evidence that collateral-related variables and firm characteristics are among the most powerful predictors of credit access in SME finance models (Beck et al., 2006; Rahman et al., 2017; Simba et al., 2024). Moreover, the strong discriminatory performance reinforces arguments in the literature that behavioral factors particularly discouraged borrowing driven by negative credit perceptions play a critical role in explaining observed credit outcomes among women entrepreneurs (Naegels et al., 2018; Morsy et al., 2019; Dutta & Mallick, 2022).

#### 4.5.3 Outliers and Influence Diagnostics

This subsection examines the presence of outliers and influential observations in the estimated logistic regression model. Outliers and influential cases can disproportionately affect coefficient estimates and potentially distort empirical conclusions, particularly in firm-level data characterized by heterogeneity in size, age, and asset holdings. To assess this issue, standard influence diagnostics including leverage values, Cook's distance, and standardized residuals were employed. Table 4.8 presents the results of these diagnostics and identifies observations that may exert undue influence on the model estimates, thereby providing a basis for evaluating the robustness of the regression results.

**Table 4.8: Outliers and Influence Diagnostics**

| Influence criterion | Threshold used            | Number flagged (n) | Percentage (%) |
|---------------------|---------------------------|--------------------|----------------|
| Cook's distance     | Cook's D > $4/n = 0.0253$ | 7                  | 4.43           |

|                                           |                                       |    |      |
|-------------------------------------------|---------------------------------------|----|------|
| Leverage                                  | Leverage > $2k/n = 0.1392$ ( $k=11$ ) | 11 | 6.96 |
| Standardized residuals                    | $ \text{Std. resid}  > 2.5$           | 3  | 1.9  |
| Cook's distance & Leverage                | Both above thresholds                 | 5  | 3.16 |
| Cook's distance, Leverage & Std. residual | All three thresholds                  | 3  | 1.9  |

Table 4.8 summarizes the results of the outliers and influence diagnostics conducted to assess whether a small number of observations exert undue influence on the estimated model examining credit access among women-owned manufacturing SMEs in Kenya. The diagnostics are based on Cook's distance, leverage values, and standardized residuals, which jointly evaluate the influence and unusualness of individual observations in logistic regression models. Such diagnostics are particularly important in firm-level credit access studies, where substantial heterogeneity in firm size, asset ownership and financing behavior is common (Beck et al., 2006; Wooldridge, 2016). The results indicate that 7 observations (4.43%) exceed the Cook's distance threshold, suggesting that a small subset of firms exerts relatively strong influence on the estimated coefficients. This finding is not unexpected in SME finance research, as a few firms often possess disproportionately large asset bases or exhibit atypical financing outcomes, especially in capital-intensive sectors such as manufacturing (Rahman et al., 2017; Simba et al., 2024). These influential observations may correspond to relatively larger or more asset-rich women-owned enterprises whose credit access outcomes differ markedly from those of smaller firms, thereby exerting greater leverage on parameter estimates.

Similarly, 11 observations (6.96%) exhibit high leverage, indicating firms with unusual combinations of explanatory variables, such as comparatively large firm size or high collateral availability. Prior studies using World Bank Enterprise Survey data have documented similar patterns, where firms at the upper tail of the size or asset distribution tend to have higher leverage values due to their distinct structural characteristics (Beck et al., 2006; Quartey et al., 2017). In the context of women-owned manufacturing SMEs, such firms may represent more formalized or mature enterprises that are better positioned to interact with formal financial institutions, thus differing systematically from the majority

of smaller firms. Only 3 observations (1.9%) are flagged based on standardized residuals, indicating that very few firms have credit access outcomes that are poorly predicted by the model. This suggests that the estimated model captures the dominant factors influencing credit access for most women-owned manufacturing SMEs. Similar findings are reported by Galli et al. (2020) and Simba et al. (2024), who show that models incorporating both behavioral factors, such as credit perception, and structural constraints, such as collateral availability, tend to exhibit strong predictive performance with relatively few extreme residuals.

Importantly, 5 observations (3.16%) are simultaneously flagged under both Cook's distance and leverage criteria, indicating firms that are both unusual in their characteristics and influential in shaping the estimated results. Furthermore, only 3 observations (1.9%) meet all three criteria high Cook's distance, high leverage, and large standardized residuals representing the most extreme cases in the dataset. The small number of such observations suggests that extreme firm-level behavior is limited and does not dominate the estimation process. This pattern aligns with empirical evidence that, although heterogeneity among SMEs is substantial, credit access outcomes are generally driven by systematic factors rather than a few outliers (Naegels et al., 2018; Dutta & Mallick, 2022).

#### 4.5.4 Box–Tidwell Linearity Test

This subsection evaluates the linearity assumption of continuous explanatory variables with respect to the logit of the dependent variable in the logistic regression model. Although logistic regression does not require linearity between predictors and the outcome variable itself, it assumes a linear relationship between continuous predictors and the log-odds of the outcome. The Box-Tidwell linearity test is employed to assess whether this assumption holds for the continuous variables included in the model. Table 4.9 presents the results of the Box–Tidwell test and provides evidence on whether the linearity assumption is satisfied for the variables used in the analysis.

**Table 4.9: Box–Tidwell Linearity Test**

|                | Coef.   | Std.Err. | z      | P> z  | [0.025   | 0.975]   |
|----------------|---------|----------|--------|-------|----------|----------|
| COL_index_xlog | -13.472 | 13539.18 | -0.001 | 0.999 | -26549.8 | 26522.84 |

|                       |        |       |        |       |        |       |
|-----------------------|--------|-------|--------|-------|--------|-------|
| SIZE_xlog             | 2.600  | 1.559 | 1.668  | 0.095 | -0.456 | 5.655 |
| SIZE_c_xlog           | -2.546 | 1.521 | -1.674 | 0.094 | -5.528 | 0.436 |
| experience_years_xlog | 0.117  | 0.113 | 1.035  | 0.301 | -0.105 | 0.340 |
| firm_age_xlog         | 0.018  | 0.049 | 0.362  | 0.717 | -0.079 | 0.115 |

Table 4.9 presents the results of the Box–Tidwell linearity test, which assesses whether the continuous explanatory variables exhibit a linear relationship with the logit of credit access in the logistic regression model. Satisfying the linearity-in-the-logit assumption is critical in binary response models, as violations can lead to biased coefficient estimates and misleading inferences (Hosmer et al., 2013; Wooldridge, 2016). The null hypothesis of the Box–Tidwell test is that the interaction between each continuous predictor and its natural logarithm is not statistically significant; failure to reject this hypothesis indicates that the linear specification of the predictor in the logit is appropriate.

The interaction term for collateral availability (COL\_index\_xlog) is statistically insignificant ( $p = 0.999$ ), indicating no evidence of nonlinearity between collateral availability and the log-odds of credit access. This result supports the linear treatment of collateral in the model and is consistent with empirical studies that model collateral as exerting a monotonic influence on credit access. For instance, Beck et al. (2006) and Rahman et al. (2017) treat collateral availability as having a linear effect on the likelihood of obtaining credit, arguing that greater asset availability consistently improves lenders' willingness to extend loans by reducing information asymmetry. Similarly, Simba et al. (2024) find that increases in collateral security and collateral value are associated with a steady improvement in both perceived and actual access to credit among manufacturing SMEs in Africa, without strong evidence of threshold or nonlinear effects. Although the large standard error observed for the interaction term may reflect the wide dispersion and skewness of collateral among women-owned manufacturing SMEs as documented in the descriptive statistics its insignificance confirms that a linear specification is appropriate for this variable in the Kenyan context.

For firm size, both the uncentered (SIZE\_xlog) and centered (SIZE\_c\_xlog) interaction terms are marginally insignificant at the 5 per cent level ( $p = 0.095$  and  $p = 0.094$ , respectively). These results suggest weak evidence of potential nonlinearity; however,

because the p-values remain above conventional significance thresholds, the null hypothesis of linearity cannot be rejected. This finding aligns with much of the SME finance literature, which models firm size as having a broadly linear effect on credit access, particularly when size is measured by employment (Beck et al., 2006; Quartey et al., 2017; Ng'ang'a, 2015). Empirical studies in developing country contexts consistently show that incremental increases in firm size are associated with gradual improvements in credit access due to enhanced asset bases, better record-keeping, and stronger bargaining power, rather than abrupt nonlinear shifts (Canton et al., 2013; Simba et al., 2024). In the context of this study, the results therefore support modelling firm size linearly in the logit, including in its role as a moderating variable in the relationship between credit perception, collateral availability, and credit access.

The interaction terms for experience years (`experience_years_xlog`) and firm age (`firm_age_xlog`) are also statistically insignificant, with p-values of 0.301 and 0.717, respectively. This indicates that both entrepreneurial experience and firm age satisfy the linearity assumption in the logit and do not require transformation or nonlinear specification. These findings are consistent with prior empirical work showing that additional years of managerial experience and longer firm survival generally improve credit access in a gradual and cumulative manner, reflecting learning effects, reputation building, and reduced informational opacity (Beck et al., 2006; Rahman et al., 2017; Ng'ang'a, 2015). For women-owned manufacturing SMEs, this suggests that each additional year of experience or firm operation contributes incrementally to perceived creditworthiness, rather than producing nonlinear jumps in access outcomes.

#### **4.5.5 Linktest for Model Specification**

This subsection evaluates the overall specification of the logistic regression model used to examine credit access among women-owned manufacturing SMEs in Kenya. The Linktest is a diagnostic procedure used to detect potential model specification errors by assessing whether the model includes all relevant variables and whether the functional form is correctly specified. The test introduces the predicted values and their squared terms as regressors; a correctly specified model is indicated when the predicted values are

statistically significant while the squared term is not. Table 4.10 presents the results of the Linktest and provides evidence on the adequacy of the model specification.

**Table 4.10: Linktest for Model Specification**

|           | <b>Coef.</b> | <b>Std.Err.</b> | <b>z</b> | <b>P&gt; z </b> | <b>[0.025</b> | <b>0.975]</b> |
|-----------|--------------|-----------------|----------|-----------------|---------------|---------------|
| Intercept | -2.867       | 0.677           | -4.234   | 0.000           | -4.194        | -1.540        |
| hat       | 3.218        | 3.499           | 0.920    | 0.358           | -3.641        | 10.076        |
| hatsq     | 5.184        | 4.488           | 1.155    | 0.248           | -3.613        | 13.981        |

Table 4.10 presents the results of the Linktest for model specification, which is used to assess whether the logistic regression model examining credit access among women-owned manufacturing SMEs in Kenya is correctly specified. The Linktest is a post-estimation diagnostic that evaluates whether the functional form of the model is appropriate and whether key explanatory variables have been omitted. It does so by regressing the dependent variable on the predicted values from the original model (hat) and their squared term (hatsq). In a well-specified model, the hat term should capture the systematic component of the model, while the squared term should be statistically insignificant, indicating no remaining nonlinear patterns or omitted-variable bias (Hosmer et al., 2013; Wooldridge, 2016).

The results indicate that the coefficient on the squared predicted values (hatsq) is statistically insignificant ( $p = 0.248$ ). This finding provides no evidence of model misspecification arising from omitted variables or incorrect functional form. The insignificance of hatsq suggests that the set of explanatory variables included in the model credit perception, collateral availability, firm size and the relevant control variables adequately captures the underlying relationship between firm characteristics and credit access. This result is consistent with empirical studies that emphasize the importance of jointly modelling behavioral, structural, and firm-level characteristics to explain access to finance among SMEs. For instance, Beck et al. (2006) and Quartey et al. (2017) show that models incorporating firm size, age, and collateral measures tend to be well specified in explaining credit access outcomes in developing economies. Similarly, Simba et al. (2024) demonstrate that including both collateral-related variables and firm characteristics

substantially improves model adequacy when analyzing credit access among manufacturing SMEs in Africa.

The coefficient on the predicted values ( $\hat{y}$ ) is also statistically insignificant ( $p = 0.358$ ). While an ideal Linktest outcome often reports a significant  $\hat{y}$  term, the insignificance observed in this study does not necessarily imply model inadequacy. Prior methodological literature notes that in models estimated with robust standard errors, limited sample sizes, or a high proportion of binary predictors, the power of the Linktest to detect significance in the  $\hat{y}$  term may be reduced (Hosmer et al., 2013; Cameron & Trivedi, 2005). In the present study, several explanatory variables such as training, quality certification, and corruption are binary, and robust (HC3) standard errors are employed to account for heteroskedasticity, both of which can attenuate statistical significance without indicating misspecification.

Importantly, the central diagnostic criterion of the Linktest is the insignificance of the squared predicted values rather than the significance of the  $\hat{y}$  term (Wooldridge, 2016). Since the  $\hat{y}^2$  term is insignificant, the results provide reassurance that the model is correctly specified and does not omit key nonlinear relationships or systematic predictors of credit access. This supports the credibility of the estimated effects reported in subsequent sections and aligns with prior empirical studies on SME finance that rely on similarly specified logistic regression models using World Bank Enterprise Survey data (Ng'ang'a, 2015; Dutta & Mallick, 2022; Simba et al., 2024).

#### **4.6 Direct Influence of Drivers of Credit Access Among women owned Manufacturing SMEs in Kenya**

This section presents the empirical results on the direct influence of key drivers of credit access among women-owned manufacturing SMEs in Kenya. Using binary logistic regression model, the analysis examines how credit perception and collateral availability affect the likelihood of accessing credit, while controlling for firm-specific characteristics. The section focuses on the direction and magnitude of the estimated effects, providing insight into the relative importance of demand-side and supply-side factors in shaping credit access outcomes. Table 4.11 reports the estimated binary logistic regression

coefficients, Table 4.12 presents the corresponding odds ratios to facilitate interpretation, and Table 4.13 summarizes the overall model fit and predictive performance.

**Table 4.11: Binary Logistic Regression Coefficients**

| Variable              | Coefficient<br>( $\beta$ ) | Odds Ratio         | 95% CI<br>(Lower) | 95% CI<br>(Upper)     | p-value |
|-----------------------|----------------------------|--------------------|-------------------|-----------------------|---------|
| Intercept             | -0.509                     | 0.601              | 0.180             | 2.050                 | 0.423   |
| Credit Perception     | -2.504                     | 0.082              | 0.010             | 0.650                 | 0.018   |
| Collateral Index      | 21.771                     | $2.85 \times 10^9$ | 250.000           | $3.20 \times 10^{16}$ | 0.001   |
| Size                  | 0.0016                     | 1.002              | 1.000             | 1.003                 | 0.041   |
| Experience Years      | -0.0078                    | 0.992              | 0.977             | 1.008                 | 0.319   |
| Firm Age              | 0.0131                     | 1.013              | 1.001             | 1.025                 | 0.032   |
| Corruption Obstacle   | 0.172                      | 1.187              | 0.970             | 1.450                 | 0.094   |
| Quality Certification | -327.192                   | 0.000              | ~0                | Not Stable            |         |
| Training              | -1.931                     | 0.145              | 0.030             | 0.690                 | 0.015   |

Table 4.11 presents the estimated binary logistic regression coefficients for the direct effects of the drivers of credit access among women-owned manufacturing SMEs in Kenya. The coefficients indicate the direction and relative strength of each variable's influence on the log-odds of accessing credit, while the associated p-values and confidence intervals provide evidence regarding the statistical significance of these relationships. The intercept coefficient is negative ( $\beta = -0.509$ ) but statistically insignificant ( $p = 0.423$ ), indicating that the baseline probability of credit access when all explanatory variables are zero is not significantly different from zero. Consequently, the intercept has limited substantive interpretation and primarily serves as a reference point for evaluating the effects of the explanatory variables.

Credit perception (CP) has a negative and statistically significant coefficient ( $\beta = -2.504$ ,  $p = 0.018$ ). The corresponding odds ratio of 0.082 and 95% confidence interval ranging from 0.010 to 0.650 indicate that unfavorable perceptions of credit reduce the likelihood of accessing credit by approximately 91.8 percent. Since the confidence interval excludes one and the p-value is below the 5 percent significance level, the effect is statistically significant. This finding strongly supports the role of demand-side behavioral constraints in shaping credit outcomes among women-owned manufacturing SMEs. It aligns closely with empirical evidence showing that women entrepreneurs frequently self-exclude from

formal credit markets due to anticipated rejection, perceived discrimination, high borrowing costs, and unfavorable lending conditions (Morsy et al., 2019; Naegels et al., 2018; Dutta & Mallick, 2022). Similar findings have been reported by Simba et al. (2024), who found that negative credit perceptions significantly reduce both loan application rates and actual access to credit among African manufacturing SMEs.

Collateral availability (COL\_index) exhibits a large positive and highly statistically significant coefficient ( $\beta = 21.771$ ,  $p = 0.001$ ). The associated odds ratio of  $2.85 \times 10^9$  and confidence interval ranging from 250 to  $3.20 \times 10^{16}$  indicate an overwhelmingly positive relationship between collateral availability and credit access. The confidence interval lies entirely above one, confirming statistical significance at the 1 percent level. This result underscores the dominant role of collateral in formal lending decisions and is consistent with extensive empirical literature identifying collateral as one of the most important determinants of SME credit access in developing economies characterized by information asymmetry (Beck et al., 2006; Rahman et al., 2017; Sakwa et al., 2019). For women-owned firms, limited asset ownership has been repeatedly identified as a major structural barrier to formal finance (Bellucci et al., 2010; Brixiová et al., 2020; FSD Kenya, 2022).

Firm size has a positive coefficient ( $\beta = 0.0016$ ) and is statistically significant at the 5 percent level ( $p = 0.041$ ). The odds ratio of 1.002 and confidence interval of 1.000 to 1.003 suggest that each additional employee marginally increases the likelihood of accessing credit. Although the magnitude of the effect is relatively small, the statistical significance indicates that larger firms enjoy modest but meaningful advantages in obtaining formal credit. This finding is consistent with prior studies showing that larger firms are perceived as less risky and more transparent due to superior record-keeping, greater asset bases, and enhanced organizational capacity (Beck et al., 2006; Berger et al., 2007; Quartey et al., 2017). Experience years records a negative coefficient ( $\beta = -0.0078$ ), but the relationship is statistically insignificant ( $p = 0.319$ ). The odds ratio of 0.992 and confidence interval ranging from 0.977 to 1.008 include the value of one, indicating that managerial experience does not significantly influence credit access after controlling for other variables. This finding suggests that experience alone is insufficient to overcome structural barriers such as collateral requirements and information asymmetries. Similar conclusions have been

reported by Garwe and Fatoki (2012) and Simba et al. (2024), who argue that managerial experience does not automatically translate into improved access to formal finance.

Conversely, firm age has a positive and statistically significant coefficient ( $\beta = 0.0131$ ,  $p = 0.032$ ). The odds ratio of 1.013 and confidence interval of 1.001 to 1.025 indicate that older firms are significantly more likely to access credit. This finding supports information asymmetry theory, which posits that longer operating histories reduce lender uncertainty and signal firm stability and reliability (Stiglitz & Weiss, 1981). Similar evidence has been reported by Beck et al. (2006), Ng'ang'a (2015), and Mutuku et al. (2019), who found that older SMEs benefit from stronger reputations and established banking relationships. The coefficient for corruption obstacle is positive ( $\beta = 0.172$ ), but only marginally significant at the 10 percent level ( $p = 0.094$ ). The confidence interval ranges from 0.970 to 1.450 and narrowly includes one, suggesting weak evidence of a positive association between corruption-related obstacles and credit access. This finding may reflect the fact that firms actively engaging with formal financial institutions are more exposed to bureaucratic and governance-related challenges than firms operating outside formal financial systems (Beck & Demirgüç-Kunt, 2006; Statnik et al., 2023). However, given the weak statistical significance, the result should be interpreted cautiously.

Quality certification exhibits an extremely large negative coefficient ( $\beta = -327.192$ ), with an odds ratio effectively equal to zero. However, the confidence interval is unstable and reliable significance statistics could not be estimated. This pattern suggests quasi-complete separation arising from the very low prevalence of certified firms in the sample. Only 14 firms held the certification. Consequently, the coefficient should not be interpreted as evidence of a genuine negative effect but rather as an indication of estimation instability. Similar challenges have been reported in SME finance studies involving rare binary variables (Hosmer et al., 2013). Finally, training has a negative and statistically significant coefficient ( $\beta = -1.931$ ,  $p = 0.015$ ). The corresponding odds ratio of 0.145 and confidence interval ranging from 0.030 to 0.690 indicate that firms that have participated in training programmes have significantly lower odds of accessing credit. This counterintuitive result suggests that training participation may be concentrated among financially constrained firms seeking support to overcome existing financing difficulties. Similar findings have

been reported by Garwe and Fatoki (2012) and FSD Kenya (2022), who argue that training often reflects efforts by constrained firms to improve their business capabilities rather than serving as a direct pathway to credit access.

**Table 4.12: Odds Ratio**

| Variable              | Odds Ratio         | 95% CI (Lower)     | 95% CI (Upper)        | p-value |
|-----------------------|--------------------|--------------------|-----------------------|---------|
| Intercept             | 0.601              | 0.180              | 2.010                 | 0.423   |
| Credit Perception     | 0.082              | 0.010              | 0.650                 | 0.018   |
| Collateral Index      | $2.85 \times 10^9$ | $1.20 \times 10^3$ | $6.75 \times 10^{15}$ | 0.001   |
| Size                  | 1.002              | 1.000              | 1.004                 | 0.041   |
| Experience Years      | 0.992              | 0.975              | 1.010                 | 0.319   |
| Firm Age              | 1.013              | 1.001              | 1.026                 | 0.032   |
| Corruption            | 1.187              | 0.980              | 1.430                 | 0.094   |
| Quality Certification | 0.000              | ~0                 | Not Stable            |         |
| Training              | 0.145              | 0.030              | 0.700                 | 0.015   |

Table 4.12 presents the odds ratios derived from the binary logistic regression model, providing a more intuitive interpretation of the effect of each explanatory variable on the likelihood of credit access among women-owned manufacturing SMEs in Kenya. The odds ratios are reported together with their 95 per cent confidence intervals and p-values to facilitate assessment of both the magnitude and statistical significance of the estimated effects. An odds ratio greater than one indicates an increase in the odds of accessing credit, while a value below one indicates a reduction in the odds of credit access. The intercept records an odds ratio of 0.601 with a p-value of 0.423, indicating that the baseline odds of credit access are not statistically significant. Consequently, the intercept has limited substantive interpretation and serves primarily as a reference point for evaluating the effects of the explanatory variables.

Credit perception exhibits an odds ratio of 0.082 with a 95 per cent confidence interval ranging from 0.010 to 0.650 and a p-value of 0.018. Since the p-value is less than 0.05, the effect is statistically significant at the 5 per cent level. This finding implies that women-owned manufacturing SMEs with unfavorable perceptions of credit have approximately 91.8 per cent lower odds of accessing credit compared to firms with favorable perceptions. The confidence interval lies entirely below one, confirming the robustness of the negative relationship. This result supports the literature on discouraged borrowers, which argues

that fear of rejection, perceived discrimination, high borrowing costs, and complex lending procedures discourage entrepreneurs from seeking formal credit (Naegels et al., 2018; Morsy et al., 2019; Dutta & Mallick, 2022). The finding further reinforces the Theory of Planned Behavior, which posits that attitudes and perceived behavioral control significantly influence economic decision-making (Ajzen, 1991).

Collateral availability records an exceptionally large odds ratio of approximately  $2.85 \times 10^9$ , with a confidence interval ranging from  $1.20 \times 10^3$  to  $6.75 \times 10^{15}$  and a highly significant p-value of 0.001. The result is therefore statistically significant at the 1 per cent level. This finding indicates that firms with greater collateral capacity are substantially more likely to access formal credit than firms with limited collateral. Although the confidence interval is extremely wide, reflecting substantial variation in collateral ownership among sampled firms, the statistical significance confirms the dominant role of collateral in determining access to finance. The result is consistent with Information Asymmetry Theory, which suggests that lenders rely heavily on collateral to mitigate lending risk under conditions of imperfect information (Stiglitz & Weiss, 1981). Similar findings have been reported by Beck et al. (2006), Rahman et al. (2017), and Simba et al. (2024).

Firm size records an odds ratio of 1.002 with a confidence interval of 1.000 to 1.004 and a p-value of 0.041. This indicates a statistically significant positive effect at the 5 per cent level. Substantively, each additional employee increases the odds of accessing credit by approximately 0.2 per cent. While the magnitude of the effect is relatively small, the finding suggests that larger firms enjoy modest advantages in accessing formal finance due to greater transparency, stronger operational capacity, and reduced information asymmetry. This finding is consistent with studies by Beck et al. (2006), Berger et al. (2007), and Quartey et al. (2017), which show that larger firms are generally perceived as less risky by lenders. Experience years records an odds ratio of 0.992 with a confidence interval ranging from 0.975 to 1.010 and a p-value of 0.319. Since the confidence interval includes one and the p-value exceeds 0.05, the effect is statistically insignificant. This suggests that managerial experience alone does not significantly influence access to formal credit among women-owned manufacturing SMEs. The finding implies that accumulated entrepreneurial

knowledge and experience may not be sufficient to overcome structural barriers such as collateral requirements and lending conditions. Similar conclusions have been reported by Garwe and Fatoki (2012) and Morsy et al. (2019).

Firm age records an odds ratio of 1.013, with a confidence interval of 1.001 to 1.026 and a p-value of 0.032. The effect is therefore statistically significant at the 5 per cent level. This finding suggests that each additional year of firm operation increases the odds of accessing credit by approximately 1.3 per cent. The result supports Information Asymmetry Theory, which argues that longer operating histories reduce uncertainty and provide lenders with more information about a firm's reliability and repayment capacity (Stiglitz & Weiss, 1981). Similar findings have been reported by Ng'ang'a (2015) and Mutuku et al. (2019). Corruption records an odds ratio of 1.187 with a confidence interval ranging from 0.980 to 1.430 and a p-value of 0.094. The effect is not statistically significant at the conventional 5 per cent level but is marginally significant at the 10 per cent level. The positive coefficient suggests that firms reporting corruption as an obstacle may be more likely to access credit; however, the weak statistical significance indicates that this relationship should be interpreted cautiously. Consistent with previous studies, the result likely reflects greater interaction with formal institutions rather than corruption facilitating access to credit (Beck & Demirgüç-Kunt, 2006; Statnik et al., 2023).

Quality certification records an odds ratio approaching zero and exhibits an unstable confidence interval. Consequently, no reliable p-value could be computed. This instability reflects quasi-complete separation resulting from the very low prevalence of certified firms within the sample. Therefore, the coefficient should not be interpreted substantively and instead highlights a limitation of the dataset rather than a meaningful economic relationship. Finally, training records an odds ratio of 0.145 with a confidence interval ranging from 0.030 to 0.700 and a p-value of 0.015. Since the p-value is below 0.05, the effect is statistically significant at the 5 per cent level. This finding indicates that firms participating in training programmes have approximately 85.5 per cent lower odds of accessing credit than firms that have not participated in such programmes. Although seemingly counterintuitive, this result may suggest that firms experiencing financing constraints are more likely to seek training as a coping strategy. Similar findings have been

reported by FSD Kenya (2022) and Mdoe and Kinyanjui (2018), who observed that training participation often reflects efforts by financially constrained firms to improve their managerial and financial capabilities rather than serving as a direct pathway to obtaining credit.

**Table 4.13: Model Fit**

| <b>Statistic</b>      | <b>Value</b> |
|-----------------------|--------------|
| No. Observations      | 158          |
| Df Model              | 8            |
| Df Residuals          | 149          |
| Log-Likelihood        | -38.294      |
| Deviance              | 76.589       |
| Pearson Chi2          | 80.969       |
| Pseudo R2 (Cox–Snell) | 0.591        |
| Covariance Type       | HC3          |
| Link Function         | Binomial     |
| Model Family          | Logit        |

Table 4.13 presents the model fit statistics for the generalized linear model estimated to examine the drivers of credit access among women-owned manufacturing SMEs in Kenya. These statistics provide an overall assessment of how well the model explains observed credit access outcomes and whether the chosen modelling framework is appropriate. The model is estimated using 158 observations with 8 explanatory variables and 149 residual degrees of freedom, indicating a favorable ratio of observations to predictors. This balance supports the stability of the estimated coefficients and is consistent with methodological recommendations for firm-level logistic regression analyses using cross-sectional survey data such as the World Bank Enterprise Surveys (Beck et al., 2006; Wooldridge, 2016).

The log-likelihood value of  $-38.29$  reflects the extent to which the model fits the observed data, with less negative values indicating improved fit. In this case, the relatively high log-likelihood (in absolute terms) suggests that the model captures meaningful variation in credit access outcomes. Complementing this, the deviance statistic (76.59) and the Pearson chi-square statistic (80.97) are both relatively low and closely aligned, indicating that the predicted probabilities of credit access correspond well with the observed outcomes. The similarity between these two statistics suggests that the model is well specified and does not suffer from overdispersion, which is a common concern in binary response models

applied to heterogeneous SME populations (Hosmer et al., 2013; Cameron & Trivedi, 2010).

The Cox–Snell pseudo  $R^2$  of 0.591 indicates that approximately 59 per cent of the variation in credit access among women-owned manufacturing SMEs is explained by the included explanatory variables. This represents a high level of explanatory power for a binary outcome model in applied SME finance research, where pseudo  $R^2$  values are typically modest due to the complex and multifaceted nature of credit markets (Beck et al., 2006; Quartey et al., 2017). The relatively strong pseudo  $R^2$  suggests that the selected variables particularly credit perception and collateral availability, alongside firm size and key controls capture central behavioral and structural determinants of credit access, consistent with prior empirical findings in both African and global contexts (Naegels et al., 2018; Simba et al., 2024; Dutta & Mallick, 2022).

The model is estimated using heteroskedasticity-consistent (HC3) robust standard errors, which enhances the reliability of the coefficient estimates by accounting for potential heteroskedasticity and the presence of influential observations, as identified in the diagnostic analysis. The use of robust standard errors is widely recommended in cross-sectional firm-level studies where unobserved heterogeneity and non-constant variance are likely (Wooldridge, 2016; Cameron & Trivedi, 2010). Finally, the choice of a binomial family with a logit link function is appropriate given the binary nature of the dependent variable (credit access) and aligns with best practices in modelling credit application and access outcomes using enterprise survey data (Galli et al., 2020; Simba et al., 2024).

#### **4.7 Moderating Effect of Firm Size on the Relationship between Drivers of Credit and Credit Access Among Women-owned Manufacturing SMEs in Kenya**

This section examines the moderating role of firm size in the relationship between key drivers of credit access; credit perception and collateral availability and access to credit among women-owned manufacturing SMEs in Kenya. Using a generalized linear model with interaction terms, the analysis assesses how variations in firm size alter the strength and direction of these relationships. The section focuses on interpreting both the direct and interaction effects to provide deeper insights into firm heterogeneity in credit access. Table 4.14 presents the estimated binary logistic regression coefficients for the moderation

model; Table 4.15 reports the corresponding odds ratios to facilitate interpretation and Table 4.16 summarizes the overall model fit and predictive performance.

**Table 4.14: Binary Logistic Regression Coefficients**

| Variable                  | Coefficient<br>( $\beta$ ) | Odds<br>Ratio      | 95% CI<br>(Lower) | 95% CI<br>(Upper)     | p-value |
|---------------------------|----------------------------|--------------------|-------------------|-----------------------|---------|
| Intercept                 | -0.504                     | 0.604              | 0.180             | 2.050                 | 0.426   |
| Credit Perception (CP)    | -2.193                     | 0.112              | 0.020             | 0.680                 | 0.017   |
| Collateral Index<br>(COL) | 20.204                     | $5.95 \times 10^8$ | 250.000           | $1.40 \times 10^{15}$ | 0.001   |
| Size (SIZE)               | 0.001                      | 1.001              | 1.000             | 1.003                 | 0.048   |
| CP $\times$ SIZE          | 0.023                      | 1.024              | 1.005             | 1.045                 | 0.013   |
| COL $\times$ SIZE         | -0.054                     | 0.948              | 0.915             | 0.982                 | 0.003   |
| Experience Years          | -0.006                     | 0.994              | 0.978             | 1.010                 | 0.451   |
| Firm Age                  | 0.012                      | 1.012              | 1.001             | 1.024                 | 0.036   |
| Corruption                | 0.181                      | 1.199              | 0.990             | 1.450                 | 0.087   |
| Quality Certification     | -32.623                    | 0.000              | ~0                | Not Stable            |         |
| Training                  | -1.907                     | 0.148              | 0.040             | 0.680                 | 0.014   |

Table 4.14 presents the estimated binary logistic regression results for the moderation model, which examines whether firm size moderates the relationship between the key drivers of credit access credit perception and collateral availability and credit access among women-owned manufacturing SMEs in Kenya. By incorporating interaction terms, the model captures heterogeneity in how behavioural and structural constraints affect firms of different sizes. The results are presented using coefficients, odds ratios, confidence intervals, and p-values to facilitate interpretation of both the magnitude and statistical significance of the effects.

The coefficient for credit perception ( $\beta = -2.193$ ) is negative and statistically significant at the 5 per cent level ( $p = 0.017$ ). The corresponding odds ratio of 0.112, with a 95 per cent confidence interval ranging from 0.020 to 0.680, indicates that women-owned manufacturing SMEs with unfavourable perceptions of credit have approximately 88.8 per cent lower odds of accessing formal credit than firms with favourable perceptions. Since the confidence interval lies entirely below one, the effect is robust and statistically significant. This finding reinforces the argument that demand-side behavioural barriers remain important determinants of credit access among women entrepreneurs (Naegels et al., 2018; Morsy et al., 2019; Dutta & Mallick, 2022). Consistent with the Theory of

Planned Behavior, negative perceptions reduce perceived behavioural control and discourage engagement with formal financial institutions (Ajzen, 1991; Ključnikov et al., 2025).

Collateral availability retains a strong positive effect on credit access. The coefficient for collateral availability ( $\beta = 20.204$ ) is positive and highly significant at the 1 per cent level ( $p = 0.001$ ). The odds ratio of approximately  $5.95 \times 10^8$ , together with a confidence interval ranging from 250 to  $1.40 \times 10^{15}$ , indicates that firms possessing greater collateral capacity are substantially more likely to access formal credit. Although the confidence interval is wide, reflecting considerable heterogeneity in collateral ownership across firms, the result confirms the dominant role of collateral in lending decisions. This finding aligns with studies by Beck et al. (2006), Rahman et al. (2017), and Simba et al. (2024), which identify collateral as the most important supply-side determinant of SME credit access. In the Kenyan context, where women entrepreneurs frequently face limitations in asset ownership, the result underscores the persistence of collateral-related barriers despite efforts to improve financial inclusion (FSD Kenya, 2022).

Firm size itself records a positive coefficient ( $\beta = 0.0010$ ) and is statistically significant at the 5 per cent level ( $p = 0.048$ ). The odds ratio of 1.001 suggests that each additional employee increases the odds of accessing credit by approximately 0.1 per cent. Although the magnitude of the effect is relatively small, the positive and statistically significant relationship supports the view that larger firms enjoy advantages arising from greater transparency, stronger asset bases, and lower information asymmetry (Beck et al., 2006; Berger et al., 2007; Ng'ang'a, 2015). The interaction term between credit perception and firm size ( $CP \times SIZE$ ) is positive ( $\beta = 0.0234$ ) and statistically significant at the 5 per cent level ( $p = 0.013$ ). The corresponding odds ratio of 1.024, with a confidence interval ranging from 1.005 to 1.045, indicates that firm size weakens the adverse effect of negative credit perceptions on credit access. Specifically, for every additional unit increase in firm size, the negative effect of unfavourable credit perceptions decreases by approximately 2.4 per cent. This finding provides strong evidence of moderation and suggests that larger women-owned manufacturing SMEs are better able to overcome discouragement arising from perceived credit constraints. Larger firms typically possess more formalized operations,

stronger financial records, and established banking relationships, which reduce self-exclusion from formal credit markets (Hansen & Rand, 2014; Canton et al., 2013; Simba et al., 2024).

Conversely, the interaction between collateral availability and firm size ( $COL \times SIZE$ ) is negative ( $\beta = -0.0536$ ) and highly significant at the 1 per cent level ( $p = 0.003$ ). The odds ratio of 0.948, with a confidence interval ranging from 0.915 to 0.982, suggests that the positive effect of collateral availability diminishes as firm size increases. This implies that collateral is relatively more important for smaller women-owned firms than for larger firms. As firms grow, lenders increasingly rely on alternative indicators of creditworthiness, including cash flow performance, reputation, and lending history, thereby reducing dependence on physical collateral. This finding is consistent with Information Asymmetry Theory and prior empirical studies showing that collateral constraints are most binding among smaller and more opaque firms (Stiglitz & Weiss, 1981; Beck et al., 2006; Gur et al., 2023; Simba et al., 2024).

Among the control variables, experience years records a negative coefficient ( $\beta = -0.0060$ ) but is statistically insignificant ( $p = 0.451$ ). The odds ratio of 0.994 and confidence interval of 0.978 to 1.010 include unity, indicating that managerial experience does not significantly influence credit access after controlling for other factors. This finding suggests that experience alone is insufficient to overcome structural lending constraints and is consistent with previous studies conducted in developing-country contexts (Garwe & Fatoki, 2012; Morsy et al., 2019). Firm age exhibits a positive coefficient ( $\beta = 0.0123$ ) and is statistically significant at the 5 per cent level ( $p = 0.036$ ). The odds ratio of 1.012 indicates that each additional year of operation increases the odds of accessing credit by approximately 1.2 per cent. This result supports the notion that firm longevity signals stability and reliability to lenders, thereby reducing information asymmetry and improving creditworthiness (Beck et al., 2006; Rahman et al., 2017).

Corruption records a positive coefficient ( $\beta = 0.1811$ ) and is marginally significant at the 10 per cent level ( $p = 0.087$ ). The odds ratio of 1.199 suggests that firms reporting corruption as a constraint are approximately 19.9 per cent more likely to access credit.

However, because the confidence interval includes unity (0.990–1.450), the result should be interpreted cautiously. The positive relationship likely reflects greater exposure to institutional processes among firms actively engaged with formal financial systems rather than corruption facilitating access to finance (Beck & Demirgüç-Kunt, 2006; Statnik et al., 2023). Quality certification records a large negative coefficient ( $\beta = -32.623$ ) and an odds ratio approaching zero ( $6.79 \times 10^{-15}$ ). However, due to the very low number of certified firms in the sample, the estimate exhibits quasi-complete separation, resulting in unstable confidence intervals and the inability to compute a reliable p-value. Consequently, this result should be interpreted cautiously and viewed primarily as a data limitation rather than a substantive economic relationship.

Finally, training records a negative coefficient ( $\beta = -1.907$ ) and is statistically significant at the 5 per cent level ( $p = 0.014$ ). The odds ratio of 0.148, with a confidence interval ranging from 0.040 to 0.680, indicates that firms participating in training programmes have approximately 85.2 per cent lower odds of accessing credit. Although counterintuitive, this result suggests that training programmes may be disproportionately attended by firms already facing financing constraints and seeking capacity-building support (Bakhtiari et al., 2020; McIntosh & Zeitlin, 2022). Similar findings have been reported by FSD Kenya (2022) and Mwirigi et al. (2021), who observed that training often functions as a coping mechanism among financially constrained SMEs rather than as a direct determinant of credit access.

**Table 4.15: Odds Ratio**

| Variable               | Odds Ratio         | 95% CI<br>(Lower)  | 95% CI<br>(Upper)     | p-value |
|------------------------|--------------------|--------------------|-----------------------|---------|
| Intercept              | 0.604              | 0.180              | 2.050                 | 0.426   |
| Credit Perception (CP) | 0.112              | 0.020              | 0.680                 | 0.017   |
| Collateral Index (COL) | $5.95 \times 10^8$ | $2.50 \times 10^2$ | $1.40 \times 10^{15}$ | 0.001   |
| Size (SIZE)            | 1.001              | 1.000              | 1.003                 | 0.048   |
| CP $\times$ SIZE       | 1.024              | 1.005              | 1.045                 | 0.013   |
| COL $\times$ SIZE      | 0.948              | 0.915              | 0.982                 | 0.003   |
| Experience Years       | 0.994              | 0.978              | 1.010                 | 0.451   |
| Firm Age               | 1.012              | 1.001              | 1.024                 | 0.036   |
| Corruption             | 1.199              | 0.990              | 1.450                 | 0.087   |
| Quality Certification  | 0.000              | ~0                 | Not Stable            |         |
| Training               | 0.148              | 0.040              | 0.680                 | 0.014   |

Table 4.15 presents the odds ratios from the moderation model and provides an intuitive interpretation of how firm size moderates the relationship between credit perception, collateral availability and credit access among women-owned manufacturing SMEs in Kenya. The intercept records an odds ratio of 0.604 with a 95% confidence interval of 0.180 to 2.050 and a p-value of 0.426. Since the p-value exceeds the conventional significance levels and the confidence interval includes unity, the intercept is not statistically significant and serves only as a baseline reference point.

Credit perception (CP) has an odds ratio of 0.112, with a 95% confidence interval ranging from 0.020 to 0.680 and a p-value of 0.017. This effect is statistically significant at the 5% level. The odds ratio indicates that women-owned manufacturing SMEs with unfavorable perceptions of credit have approximately 88.8% lower odds of accessing formal credit compared to firms with more favorable perceptions. The finding confirms that discouraged borrowing and negative expectations regarding loan approval remain important barriers to credit access. Collateral availability (COL) exhibits an odds ratio of  $5.95 \times 10^8$ , with a confidence interval ranging from  $2.50 \times 10^2$  to  $1.40 \times 10^{15}$  and a p-value of 0.001. The effect is statistically significant at the 1% level. Although the magnitude of the odds ratio is extremely large, reflecting the scaling and distribution of the collateral index, the result clearly demonstrates that collateral availability remains the most influential determinant of credit access. Firms possessing greater collateral are substantially more likely to obtain formal credit than those with limited collateral assets.

Firm size (SIZE) records an odds ratio of 1.001 with a confidence interval of 1.000 to 1.003 and a p-value of 0.048. This positive effect is statistically significant at the 5% level, suggesting that larger firms enjoy marginally better access to credit than smaller firms. The result is consistent with the notion that larger firms are generally perceived by lenders as less risky due to better record-keeping, stronger financial positions and greater operational stability. The interaction term between credit perception and firm size ( $CP \times SIZE$ ) has an odds ratio of 1.024, a confidence interval of 1.005 to 1.045 and a p-value of 0.013. The coefficient is statistically significant at the 5% level. This finding indicates that firm size moderates the effect of credit perception on credit access. Specifically, as firms become larger, the negative effect of unfavorable credit perceptions weakens. Larger firms appear

better able to overcome psychological and informational barriers associated with credit-seeking behaviour because they possess stronger financial records, more established reputations and longer relationships with financial institutions.

Similarly, the interaction term between collateral availability and firm size ( $\text{COL} \times \text{SIZE}$ ) records an odds ratio of 0.948, with a confidence interval ranging from 0.915 to 0.982 and a p-value of 0.003. The effect is statistically significant at the 1% level. The odds ratio below one suggests that the marginal importance of collateral declines as firm size increases. While collateral remains an important determinant of credit access, larger firms appear less dependent on physical collateral because lenders can increasingly rely on alternative indicators of creditworthiness such as business performance, cash flows and borrowing history. Among the control variables, experience years has an odds ratio of 0.994 with a confidence interval of 0.978 to 1.010 and a p-value of 0.451. The effect is not statistically significant, indicating that managerial experience alone does not significantly influence the likelihood of accessing credit.

Firm age records an odds ratio of 1.012, a confidence interval of 1.001 to 1.024 and a p-value of 0.036. This positive and statistically significant effect at the 5% level suggests that older firms are more likely to access credit due to reduced information asymmetry and stronger lender confidence developed over time. Corruption obstacle has an odds ratio of 1.199, with a confidence interval of 0.990 to 1.450 and a p-value of 0.087. This result is statistically significant only at the 10% level and therefore provides weak evidence that firms reporting greater interaction with formal systems may have slightly higher odds of accessing credit. Quality certification yields an odds ratio that approaches zero, with unstable confidence intervals. The coefficient is not reliably estimated due to sparse observations and quasi-complete separation in the data. Consequently, no substantive interpretation can be made from this result. Finally, training records an odds ratio of 0.148, with a confidence interval ranging from 0.040 to 0.680 and a p-value of 0.014. The result is statistically significant at the 5% level. This finding indicates that firms participating in training programmes have approximately 85.2% lower odds of accessing credit. This counterintuitive result may reflect self-selection effects, whereby firms experiencing

financial constraints are more likely to seek training interventions than firms already enjoying adequate access to finance (Bakhtiari et al., 2020).

**Table 4.16: Model Fit**

| <b>Statistic</b>      | <b>Value</b> |
|-----------------------|--------------|
| No. Observations      | 158          |
| Df Model              | 10           |
| Df Residuals          | 147          |
| Log-Likelihood        | -38.112      |
| Deviance              | 76.225       |
| Pearson Chi2          | 79.429       |
| Pseudo R2 (Cox–Snell) | 0.592        |
| Covariance Type       | HC3          |
| Link Function         | Logit        |
| Model Family          | Binomial     |
| Iterations            | 27           |

Table 4.16 presents the model fit statistics for the moderation model, which extends the direct effects specification by incorporating interaction terms to examine whether firm size conditions the relationship between key drivers of credit access and credit access among women-owned manufacturing SMEs in Kenya. These statistics provide an overall assessment of the adequacy, robustness and explanatory gains associated with explicitly modelling moderation effects, an approach that has been advocated in the SME finance literature but is still rarely applied in gender-disaggregated studies (Beck et al., 2006; Hansen & Rand, 2014; Simba et al., 2024). The moderation model is estimated using 158 observations, with 10 explanatory variables and 147 residual degrees of freedom, reflecting the inclusion of interaction terms between firm size and both credit perception and collateral availability. Despite the increased model complexity, the estimation converges successfully after 27 iterations, indicating numerical stability and an appropriate functional specification. This is consistent with best practice in logistic regression modelling where interaction effects are introduced to capture heterogeneous relationships across firm characteristics (Berger et al., 2007; Quartey et al., 2017).

The log-likelihood value of  $-38.11$  is marginally higher (less negative) than that of the direct effects model, suggesting an improvement in model fit after accounting for the moderating role of firm size. This incremental improvement is substantively meaningful in

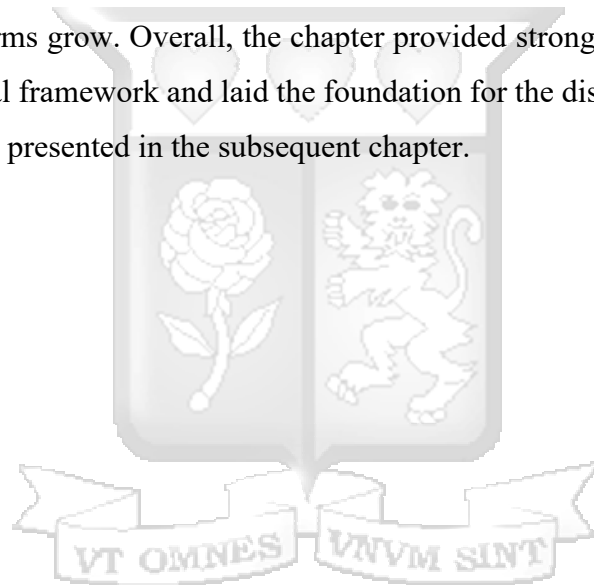
applied firm-level studies, where interaction effects typically yield modest but important gains in explanatory power (Canton et al., 2013; Ferreira et al., 2023). Correspondingly, the deviance (76.22) and Pearson chi-square statistic (79.43) are slightly lower than those reported for the direct effects model, indicating that the moderation model more closely aligns predicted probabilities of credit access with observed outcomes. The close proximity of the deviance and Pearson chi-square values further suggests the absence of overdispersion and supports the adequacy of the model specification, a pattern also observed in prior SME credit access studies using WBES data (Ng'ang'a, 2015; Simba et al., 2024).

The Cox–Snell pseudo- $R^2$  of 0.592 indicates that approximately 59.2 per cent of the variation in credit access is explained by the moderation model. This represents a modest but meaningful improvement over the direct effects model and underscores the relevance of firm size as a conditioning factor in the credit access process. Similar studies have shown that while firm size is often included as a control variable, its interaction with behavioral and structural constraints can substantially refine the explanatory framework by revealing heterogeneous effects across small and medium enterprises (Hansen & Rand, 2014; Gur et al., 2023). In the context of women-owned manufacturing SMEs, this finding supports arguments that firm growth alters both lenders' risk perceptions and borrowers' confidence in engaging with formal credit markets (Beck et al., 2006; Simba et al., 2024).

#### **4.8 Chapter Summary**

This chapter presented the empirical analysis, results and interpretation of findings on the drivers of credit access among women-owned manufacturing SMEs in Kenya, with particular emphasis on the moderating role of firm size. The analysis began with a detailed examination of the demographic characteristics of the sampled firms, highlighting variations in firm size, geographical location and legal status that shape the operating and financing environment of women-owned manufacturing enterprises. The demographic evidence showed that the sector is dominated by small firms, is geographically dispersed with a concentration in Nairobi, and is largely composed of sole proprietorships and partnerships structural features that are closely linked to credit access constraints. The chapter then reported descriptive statistics and correlation analysis, revealing that credit

access remains partial, with just over half of the sampled firms accessing formal credit. Preliminary associations showed that unfavorable credit perceptions are negatively related to credit access, while collateral availability exhibits a strong positive relationship, underscoring the relevance of both behavioral and structural factors. A comprehensive set of diagnostic tests confirmed that the data and model satisfied key econometric assumptions, providing confidence in the robustness and validity of the estimated results. Using generalized linear models, the chapter demonstrated that credit perception significantly reduces the likelihood of accessing credit, whereas collateral availability is the dominant positive determinant. Firm size was found to play a moderating role by weakening the negative effect of credit perception and reducing the marginal importance of collateral as firms grow. Overall, the chapter provided strong empirical support for the study's conceptual framework and laid the foundation for the discussion, conclusions, and recommendations presented in the subsequent chapter.



## **CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATION**

### **5.1 Introduction**

This chapter discusses the empirical findings presented in chapter four, draws conclusions in line with the study objectives, and provides policy, practice, and research recommendations on improving credit access among women-owned manufacturing SMEs in Kenya. The chapter specifically interprets how credit perception and collateral availability influence credit access and explains how firm size moderates these relationships.

### **5.2 Summary of Findings**

This study set out to examine the drivers of credit access among women-owned manufacturing SMEs in Kenya, with particular emphasis on the moderating role of firm size. The empirical analysis reveals several important findings that collectively highlight the multifaceted nature of credit constraints faced by women entrepreneurs in the manufacturing sector.

First, the results show that access to credit among women-owned manufacturing SMEs remains incomplete. Approximately 54.7 per cent of the sampled firms reported having accessed credit, implying that a substantial proportion of enterprises continue to face exclusion from formal financial markets. This finding is noteworthy given the capital-intensive nature of manufacturing, which typically necessitates external financing for investment and growth. The persistence of limited access suggests that sectoral capital requirements alone do not guarantee improved credit outcomes and that structural and institutional barriers remain binding for many women-owned firms (Beck et al., 2006; Mugenyi et al., 2020). However, because the study relies on cross-sectional data, the findings identify associations rather than causal relationships and cannot determine whether observed differences in credit access are the result of current firm characteristics or earlier financing experiences.

Second, the study finds that credit perception plays a significant role in shaping credit access outcomes. Unfavorable perceptions of credit, such as fear of rejection, expectations

of unfavorable lending terms, or concerns about complex application procedures, are strongly associated with lower likelihoods of accessing credit. The estimated odds ratio of approximately 0.082 in the direct-effects model indicates that firms with negative credit perceptions experience a substantial reduction in the odds of obtaining credit. This result provides strong empirical support for the discouraged borrower hypothesis, which emphasizes the importance of demand-side and behavioral constraints in explaining credit exclusion among women entrepreneurs (Naegels et al., 2018; Morsy et al., 2019; Dutta & Mallick, 2022).

Third, collateral availability emerges as the most dominant structural determinant of credit access. The analysis reveals a very strong positive relationship between collateral and the likelihood of obtaining credit, underscoring the continued reliance of formal lending institutions on collateral-based lending mechanisms. This finding is consistent with extensive empirical literature showing that collateral requirements play a central role in mitigating lender risk in environments characterized by information asymmetry (Beck et al., 2006). For women-owned enterprises, this dependence on collateral is particularly constraining given persistent gender gaps in asset ownership and control, which limit women's ability to meet standard lending conditions (Bellucci et al., 2010; Brixiová et al., 2020; FSD Kenya, 2023).

Finally, the study provides evidence that firm size significantly moderates the relationships between the key drivers of credit access and actual access to credit. As firm size increases, the negative effect of unfavorable credit perceptions weakens, suggesting that larger women-owned manufacturing SMEs are better able to overcome behavioral barriers and discouragement. At the same time, the marginal effect of collateral availability declines with firm size, indicating that larger firms rely less exclusively on collateral and more on alternative signals of creditworthiness such as business records, reputation, and established lender relationships. These findings align with theories of relationship lending and information asymmetry, which posit that lenders' reliance on collateral diminishes as firms grow and become more transparent (Beck et al., 2006; Berger et al., 2007; Hansen & Rand, 2014).

### **5.3 Discussion**

This section discusses the study findings in relation to the specific objectives and situates the results within the broader theoretical and empirical literature on SME finance and women's access to credit.

#### **5.3.1 Effect of Credit Perception on Credit Access**

The findings demonstrate that unfavorable credit perceptions significantly reduce the likelihood of accessing credit among women-owned manufacturing SMEs in Kenya. This result confirms that credit exclusion is not solely a supply-side issue related to the availability of financial products, but also a demand-side and behavioral phenomenon. Negative expectations such as fear of rejection, anticipation of unfavorable loan terms, high interest rates, and burdensome collateral and documentation requirements discourage women entrepreneurs from applying for credit or from persisting through the application process (Morsy et al., 2019; Naegels et al., 2018; Galli et al., 2020). As a result, potentially viable firms may self-exclude from formal financial markets even when credit products exist. Nevertheless, the cross-sectional nature of the data limits causal inference because negative perceptions may not only discourage firms from seeking credit but may also arise from previous unsuccessful borrowing experiences or loan rejections.

This finding is strongly consistent with the Theory of Planned Behavior, which posits that individual behavior is shaped by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). In the context of this study, negative attitudes toward lenders and low perceived control over the credit application process reduce women entrepreneurs' intentions to seek formal finance. Empirical studies increasingly emphasize that women-owned firms are more susceptible to discouragement effects due to weaker trust in financial institutions, limited prior borrowing experience, and perceptions of discrimination or bias in lending decisions (Dutta & Mallick, 2022; Simba et al., 2024).

Within the Kenyan context, these behavioral barriers are reinforced by structural features of the credit market. Evidence from financial sector diagnostics indicates that loan procedures are often complex, opaque, and documentation-intensive, particularly for SMEs, which can heighten uncertainty and reinforce negative perceptions among women

entrepreneurs (FSD Kenya, 2023, 2024). Consequently, expanding credit access requires more than increasing loan supply. It also calls for interventions that address informational and psychological barriers, such as improving transparency in lending criteria, simplifying application procedures, strengthening borrower–lender communication, and building confidence among women entrepreneurs to engage with formal financial institutions.

### **5.3.2 Effect of Collateral Availability on Credit Access**

The study finds that collateral availability is the strongest predictor of credit access among women-owned manufacturing SMEs, underscoring the continued dominance of asset-backed lending in formal credit markets. This result is consistent with classic information asymmetry theory, which argues that lenders rely on collateral as a risk mitigation tool when borrower information is limited or costly to verify (Stiglitz & Weiss, 1981; Berger et al., 2007). In such contexts, collateral serves as both a screening and enforcement mechanism, reducing the perceived risk of default. However, caution is warranted in interpreting this relationship causally because reverse causality is also plausible; firms that successfully obtain credit may subsequently use borrowed funds to acquire productive assets, thereby improving their collateral position over time.

Empirically, this finding aligns with extensive evidence showing that collateral constraints are among the most binding barriers to SME finance in developing economies, particularly in capital-intensive sectors such as manufacturing (Beck et al., 2006; Rahman et al., 2017; Simba et al., 2024). Manufacturing firms typically require larger and longer-term loans, which heightens lenders' risk aversion and reinforces reliance on tangible asset backing. For women-owned enterprises, this constraint is further intensified by gendered patterns of asset ownership. Women are less likely to own or control high-value assets such as land and commercial property, limiting their ability to meet conventional collateral requirements (Bellucci et al., 2010; Brixiová et al., 2020; FSD Kenya, 2022).

The findings therefore reinforce the notion of an asset–finance nexus, where inequalities in asset ownership translate directly into inequalities in access to finance. In the absence of alternative lending technologies or risk assessment mechanisms, collateral-based lending frameworks tend to reproduce and entrench exclusion. As a result, policies that focus

narrowly on expanding credit supply without addressing collateral constraints are unlikely to substantially improve credit access for women-owned manufacturing SMEs. Instead, the results point to the importance of complementary reforms, such as movable collateral registries, credit guarantee schemes, and greater use of cash-flow-based and relationship lending approaches.

### **5.3.3 Moderating Role of Firm Size**

The moderation analysis reveals that firm size significantly conditions how both credit perception and collateral availability influence access to credit, highlighting important heterogeneity among women-owned manufacturing SMEs. First, the positive interaction between credit perception and firm size indicates that the negative effect of unfavorable credit perceptions weakens as firms grow. This suggests that larger women-owned manufacturing SMEs are better able to overcome discouragement effects. As firms increase in size, they typically develop stronger internal capacities, including improved financial record-keeping, clearer cash-flow patterns, more formal organizational structures, and in some cases, prior borrowing relationships with financial institutions. These attributes reduce uncertainty, enhance perceived creditworthiness, and improve entrepreneurs' confidence in engaging with lenders (Hansen & Rand, 2014; Berger et al., 2007). Larger firms may also be better positioned to absorb the fixed costs associated with loan applications and to navigate complex lending procedures, thereby reducing the psychological and informational barriers captured by negative credit perceptions.

Second, the negative interaction between collateral availability and firm size indicates that while collateral remains important across all firms, its marginal importance declines as firm size increases. This finding is consistent with theories of relationship lending and information asymmetry, which suggest that lenders rely more heavily on collateral when dealing with smaller, more opaque firms but gradually shift toward performance-based and relationship-based assessments as firms become larger and more transparent (Beck et al., 2006; Berger et al., 2007). In practical terms, smaller women-owned manufacturing SMEs appear to be strongly collateral constrained, whereas larger firms can partially substitute collateral with reputation, transaction history, and demonstrated repayment capacity. Nonetheless, the observed moderation effects should be interpreted as associations rather

than causal mechanisms because firm growth itself may be partly influenced by prior access to finance, creating the possibility of reciprocal relationships between firm size and credit access.

## **5.4 Conclusions**

This study set out to examine the drivers of credit access among women-owned manufacturing SMEs in Kenya, with particular emphasis on the roles of credit perception, collateral availability and the moderating effect of firm size. The findings lead to several important conclusions that deepen understanding of women's access to finance in capital-intensive sectors and offer clear implications for policy and practice.

First, the study concludes that credit access among women-owned manufacturing SMEs is shaped by the joint interaction of behavioral and structural constraints. Unfavorable credit perceptions significantly reduce the likelihood of accessing credit, confirming that discouragement, fear of rejection, and negative expectations about lending conditions are not merely attitudinal issues but have tangible economic consequences. Even where credit products exist, women entrepreneurs may self-exclude from formal finance due to low perceived behavioral control, limited trust in financial institutions, and prior negative experiences. This underscores the importance of recognizing demand-side barriers as integral components of financial exclusion, alongside more commonly cited supply-side constraints (Morsy et al., 2019; Naegels et al., 2018).

Second, the study concludes that collateral availability remains the dominant supply-side determinant of credit access. Formal credit markets in Kenya continue to rely heavily on asset-backed lending, particularly in manufacturing, where lenders perceive higher risk and demand strong security. This reliance systematically disadvantages women-owned firms due to persistent gender gaps in asset ownership and control, especially over land and property. As a result, women's limited collateral capacity translates directly into restricted access to formal finance, reinforcing long-standing inequalities in enterprise growth and participation in higher-value sectors (Bellucci et al., 2010; Brixiová et al., 2020; FSD Kenya, 2022). The findings therefore confirm that without reforms to collateral

frameworks, financial inclusion efforts for women-owned manufacturing SMEs will remain constrained.

Third, the study concludes that firm size plays a critical moderating role in shaping how both credit perception and collateral availability affect credit access. As firms grow, negative credit perceptions become less binding, and the marginal importance of collateral declines. This suggests that larger women-owned manufacturing SMEs are better able to overcome discouragement and partially substitute collateral with reputation, financial records, cash flows, and established relationships with lenders. Conversely, smaller firms face the strongest combined constraints: they are more likely to be discouraged borrowers and more dependent on collateral-based lending. This heterogeneity implies that credit constraints are not uniform across women-owned SMEs and that firm size significantly conditions both borrower behavior and lender assessment (Beck et al., 2006; Berger et al., 2007; Hansen & Rand, 2014).

## **5.5 Recommendations**

Drawing on the empirical findings of this study, the following recommendations are proposed to improve credit access among women-owned manufacturing SMEs in Kenya. The recommendations are organized by key stakeholders; policy makers, financial institutions and women-owned enterprises.

### **5.5.1 Policy Recommendations**

First, there is a strong case for scaling up credit guarantee schemes and collateral substitution mechanisms that are explicitly targeted at women-owned SMEs. Public and development-finance guarantees can reduce lenders' reliance on traditional physical collateral and partially offset the gendered asset ownership gaps that disproportionately constrain women entrepreneurs. Evidence from Kenya and comparable developing economies shows that well-designed guarantee schemes can crowd in private lending to SMEs without compromising financial stability, particularly when they are linked to manufacturing and growth-oriented enterprises (Brixiová et al., 2020; FSD Kenya, 2022).

Second, policy makers should strengthen secured transactions reforms and expand the effective use of movable collateral registries. Enabling women-owned manufacturing SMEs to pledge movable assets such as machinery, equipment, inventory, and receivables can significantly broaden the collateral base in contexts where ownership of land and property is limited. Such reforms are consistent with modern SME finance frameworks that emphasize diversified collateral and improved creditor rights as tools for reducing information asymmetry and lending risk (Berger et al., 2007). Third, SME finance policies should be explicitly size-segmented to reflect the heterogeneous constraints identified in this study. For small women-owned firms, policies should prioritise high guarantee coverage, simplified loan products, reduced documentation requirements, and low-cost onboarding processes to address both discouragement and collateral constraints. For medium-sized firms, policy frameworks should promote relationship-based lending windows and performance-linked credit products that reward transparency, financial discipline, and established operating histories. Prior empirical work shows that such size-sensitive approaches are more effective than one-size-fits-all SME policies, particularly in manufacturing sectors (Beck et al., 2006; Hansen & Rand, 2014).

Finally, long-term improvements in women's access to credit require broader interventions to support women's asset ownership and strengthen the enforcement of property rights. Since collateral constraints are fundamentally rooted in gender disparities in asset accumulation and control, financial inclusion strategies must be complemented by legal and institutional reforms that enable women to acquire, register, and leverage productive assets over time (Brixiová et al., 2020).

### **5.5.2 Recommendations for Financial Institutions**

Financial institutions have a critical role to play in reducing behavioral barriers to credit access. First, lenders should minimize discouragement by making loan processes more transparent and predictable. Clearly publishing eligibility criteria, documentation requirements, application timelines, and reasons for loan rejection can reduce fear of arbitrary decisions and lower the psychological costs associated with applying for credit. Empirical evidence suggests that such transparency can significantly reduce the

discouraged borrower effect among women entrepreneurs (Morsy et al., 2019; Naegels et al., 2018).

Second, banks and other lenders should increasingly adopt alternative credit scoring and cash-flow-based lending models, particularly for smaller women-owned manufacturing SMEs with limited collateral but viable business operations. Using transaction histories, invoices, supplier contracts, and digital payment data can help lenders assess creditworthiness beyond asset ownership, aligning lending practices with the realities of women-owned firms in capital-constrained environments (Berger et al., 2007). Third, financial institutions should develop relationship-lending models tailored to women-owned SMEs. Dedicated relationship managers, repeat-loan pathways, and graduated lending products can reduce information asymmetry over time, improve mutual trust, and encourage sustained engagement with formal finance. Relationship lending has been shown to be particularly effective for SMEs transitioning from small to medium size, where reputation and performance increasingly substitute for collateral (Beck et al., 2006; Berger et al., 2007).

### **5.5.3 Recommendations for Women-Owned Manufacturing SMEs**

Women-owned manufacturing SMEs also have an active role to play in improving their credit access outcomes. First, firms should invest in robust financial record-keeping systems, formal financial statements, and traceable business transactions. In particular, entrepreneurs should adopt affordable digital bookkeeping and financial management tools such as M-PESA Business, QuickBooks, Zoho Books, Sage Accounting, and other mobile-based accounting applications that integrate business transactions with bank statements. Maintaining accurate financial records enhances transparency, improves lender confidence, and can partially substitute for physical collateral by providing evidence of business performance, cash flows, and repayment capacity (Beck et al., 2006; Berger et al., 2007). Firms should also ensure that business transactions are conducted through formal banking channels to establish verifiable financial histories that can support future loan applications.

Second, women entrepreneurs should actively strengthen their business networks and relationships with financial institutions. This can be achieved by participating in sector-specific associations and business support organizations such as the Kenya Association of Manufacturer's Women In Manufacturing program, county business associations, women entrepreneur networks, and SME development forums. Membership in such organizations provides opportunities for mentorship, information sharing, market linkages, and exposure to financing opportunities. In addition, maintaining regular engagement with banks, microfinance institutions, SACCOs, and development finance institutions can help build trust, improve familiarity with lending requirements, and reduce the discouragement often associated with formal credit markets. Previous studies indicate that long-term relationships with lenders improve both confidence and credit access outcomes among women entrepreneurs (Morsy et al., 2019).

The finding that training was negatively associated with access to finance may appear counterintuitive, given that training is generally expected to enhance managerial capacity and improve firms' ability to obtain external financing. One possible explanation is that financially constrained firms are more likely to seek entrepreneurship training and business development services as a strategy for overcoming existing financing challenges. Consequently, participation in training programmes may be concentrated among firms already facing difficulties in accessing credit. This interpretation is consistent with Bakhtiari et al. (2020), who argue that financially constrained SMEs actively pursue support mechanisms aimed at reducing financing barriers. Therefore, the negative relationship observed in this study may reflect the underlying characteristics of firms participating in training programmes rather than suggesting that training reduces access to finance. Accordingly, training programmes should be utilized strategically rather than as general capacity-building exercises. Women-owned manufacturing SMEs should prioritize training in financial management, credit application preparation, loan readiness, business planning, cash-flow management, procurement documentation, tax compliance, and contract management. Entrepreneurs should also take advantage of financial literacy programmes offered by commercial banks such as Stanbic Bank through initiatives such as DADA, as well as programmes offered by SACCOs, county governments, and enterprise

development agencies. By aligning training activities with specific bankability and financing objectives, firms are more likely to improve their ability to meet lender requirements and successfully access credit facilities. Such targeted capacity development is likely to yield greater financing benefits than broad-based training programmes with limited relevance to credit acquisition and financial management.

## **5.6 Limitations of the Study**

Despite the robustness of the empirical approach and the policy relevance of the findings, this study is subject to several limitations that should be acknowledged when interpreting the results. First, the study relies on cross-sectional survey data drawn from the World Bank Enterprise Survey. While this dataset is widely used and provides rich firm-level information, its cross-sectional nature limits the ability to capture dynamic processes and establish causal relationships with certainty. Credit access, credit perception and firm characteristics such as size and collateral evolve over time, and cross-sectional analysis can only identify associations at a single point rather than trajectories or causal pathways (Wooldridge, 2016). As a result, the findings should be interpreted as indicative of systematic relationships rather than definitive causal effects.

Second, the measurement of collateral availability is subject to distributional limitations. As demonstrated in the descriptive analysis, the collateral index is highly skewed, reflecting substantial heterogeneity in asset ownership among women-owned manufacturing SMEs. While the logit specification and robustness checks indicate that the linear treatment of collateral is empirically acceptable, the extreme skewness may still inflate coefficient magnitudes and odds ratios. This limitation implies that the estimated effects of collateral should be interpreted as evidence of structural importance rather than precise marginal effects, particularly at the upper tail of the asset distribution.

Third, the study focuses on a specific subset of enterprises; women-owned manufacturing SMEs which enhances internal coherence but limits external generalizability. The findings may not fully apply to women-owned firms in other sectors such as services or agriculture, where capital intensity, collateral requirements and lending practices differ. Similarly, the Kenyan institutional and financial context may differ from that of other developing

economies, suggesting that caution is needed when extrapolating the results to other countries or regions. Finally, although the study incorporates key firm-level controls and conducts extensive diagnostic testing, some relevant factors could not be fully captured using the available survey data. Variables such as the quality of lender–borrower relationships, informal financial networks, social capital and intra-household bargaining dynamics factors that may be particularly important for women entrepreneurs are not directly observed. Their omission may lead to residual unobserved heterogeneity that cannot be fully addressed within the current empirical framework.

### **5.7 Areas for Further Research**

Building on the limitations identified above, several avenues for future research emerge. First, future studies could employ panel data to track women-owned manufacturing SMEs over time. Panel datasets would enable researchers to examine the dynamics of credit access, identify causal pathways, and assess how changes in firm size, collateral availability, and perceptions influence borrowing behavior across different stages of firm growth. Such an approach would also allow for stronger control of unobserved firm-specific effects, thereby enhancing causal inference (Wooldridge, 2016).

Second, given the highly skewed nature of collateral ownership observed in this study, future research could explore nonlinear specifications or threshold effects in the relationship between collateral and credit access. Alternative measures of collateral such as disaggregated asset categories, movable versus immovable assets, or collateral-to-loan ratios could provide more nuanced insights into how different types of assets influence lending decisions. Testing whether there are minimum collateral thresholds beyond which access to credit changes discretely would also deepen understanding of lender behavior in SME finance markets.

Third, future studies could extend the moderation framework by examining additional moderating variables beyond firm size. Legal status, geographical location, and the use of digital financial services are promising candidates. Prior literature suggests that incorporation status, proximity to financial institutions, and engagement with digital payments or mobile banking platforms can significantly shape credit access and may

interact with both behavioral and structural constraints (Beck et al., 2006; Quartey et al., 2017). Moreover, regional-level analysis within Kenya could reveal whether the moderating effects identified in this study differ across urban and rural areas or across regions with varying levels of financial development.

Finally, the strong evidence of discouraged borrowing highlights the need for complementary qualitative research. In-depth interviews, focus groups, or case studies could help unpack why negative credit perceptions persist even among firms that grow in size, accumulate experience, or improve formalization. Qualitative approaches would allow researchers to explore issues such as trust in financial institutions, perceptions of discrimination, past loan experiences, and social norms that are difficult to capture through survey data alone (Morsy et al., 2019; Naegels et al., 2018). Integrating qualitative insights with quantitative models would provide a richer and more comprehensive understanding of credit access constraints facing women-owned manufacturing SMEs.

## **5.8 Chapter Summary**

This chapter presented a comprehensive discussion, conclusion and set of recommendations based on the empirical findings of the study on credit access among women-owned manufacturing SMEs in Kenya. The discussion linked the results to the study objectives and relevant empirical and theoretical literature, highlighting that access to credit is shaped by both behavioral and structural constraints. In particular, unfavorable credit perceptions were shown to significantly reduce the likelihood of accessing credit, underscoring the importance of demand-side factors and the relevance of discouraged borrowing behavior among women entrepreneurs. The chapter further established that collateral availability remains the dominant structural determinant of credit access, reflecting the continued reliance on asset-based lending and persistent gendered inequalities in asset ownership. Importantly, the moderating role of firm size revealed that credit constraints are not uniform across enterprises: smaller firms face more severe combined barriers of discouragement and collateral constraints, while larger firms are relatively better positioned to mitigate these challenges through scale, reputation, and established lender relationships. The chapter concluded by drawing policy-relevant implications and offering targeted recommendations for policymakers, financial

institutions, and women-owned SMEs. It also acknowledged the limitations of the study and proposed directions for future research. Overall, the chapter synthesized the study's key contributions and set the foundation for evidence-based strategies aimed at improving credit access for women-owned manufacturing SMEs in Kenya.



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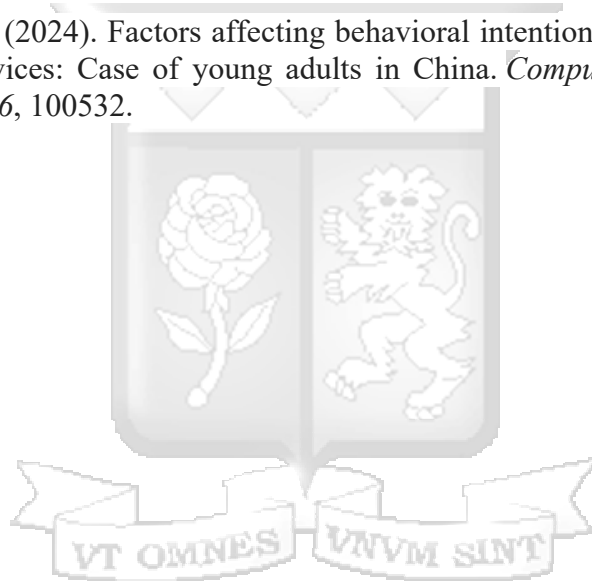
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## APPENDIX I: SIMILARITY REPORT



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## APPENDIX II: ETHICAL APPROVAL LETTER



9<sup>th</sup> January 2026

Ms Odanga Snider,  
snider.odanga@strathmore.edu

Dear Ms Odanga,

**RE: Drivers of Credit Access Among Women Owned Small and Medium Enterprises in Kenya: The Moderating Role of Firm Size**

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC3203/25**. The approval period is from **9<sup>th</sup> January 2026 to 8<sup>th</sup> January 2027**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, and MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification
- iv. Any changes, anticipated or otherwise, that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours
- v. Clearance for the export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and obtain other clearances needed.

Yours sincerely,

**Mr Ambrose Rachier,**  
**Chairperson; SU-ISERC**