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By Josea K. Cheruiyot

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Discouraged Borrowers and Access to Finance: Evidence from Kenyan SMEs

Josea K. Cheruiyot

Abstract

This paper examines the incidence and determinants of credit rationing and borrower discouragement among Kenyan SMEs using firmlevel data from the 2018 World Bank Enterprise Survey. Only about onequarter of firms report no financing obstacles, while the majority face constraints of varying severity. Younger, informally registered, femaleowned, and unaudited firms are significantly more likely to be constrained, consistent with informational opacity and limited collateral. Credit application patterns indicate extensive selfexclusion: roughly threequarters of SMEs do not apply for loans despite plausible financing needs, citing anticipated rejection, high interest rates, collateral requirements, or other perceived deterrents. Among those who apply, approval rates exceed 90 percent, suggesting that effective rationing arises mainly from preapplication barriers rather than lender denial. These findings indicate that frictions—limited transparency, weak disclosure, and elevated borrower risk perceptions—play a central role in suppressing SME participation in the formal credit market. Policies that expand collateral substitutes, strengthen credit information systems, and support financial reporting could alleviate these frictions and broaden access to credit.

Keywords: SMEs; Credit; Financing Constraints; Discouraged Borrowers; Kenya.

1.0 Introduction

Access to finance continues to be a first order constraint facing small and medium sized enterprises (SMEs) in developing economies. Theoretical models of credit rationing emphasize that, under asymmetric information, credit markets may not clear through interest rate adjustments, producing equilibria in which observationally similar but creditworthy firms are persistently excluded from formal credit (Stiglitz & Weiss, 1981).

In these models, increases in lending rates worsen borrower selection and effort incentives, limiting price-based screening. Adverse selection and moral hazard therefore interact with collateral requirements and weak enforcement to reinforce rationing outcomes (Bester, 1985; Besanko & Thakor, 1987). An extension of this framework is the concept of discouraged borrowers: firms that self select out of applying for credit because they anticipate rejection or view the application process as prohibitively costly (Kon & Storey, 2003; Beck & Demirgüç Kunt, 2006). Recent survey refinements show that rationing spans outright denials, partial approvals, and pre application discouragement, the latter often being misclassified in earlier instruments (Islam & Rodriguez, 2023).

Despite its theoretical salience, discouraged borrowing is comparatively understudied in African credit markets, where informational frictions, high borrowing costs, and weak contract enforcement remain systematically pronounced. Cross country evidence from Europe, Asia, and Latin America documents heterogeneous financing constraints linked to firm size, age, gender, transparency, and institutional context (McCarthy, Lok, & Morrissey, 2015; Hoque, Sultana, & Thalil, 2016; Kallandranis & Drakos, 2021; Yu, 2021). Yet African evidence remains thin relative to the scale of frictions. Global data indicate that roughly 30 percent of formal firms are credit constrained and that many non applicants report either sufficient internal funds or self deterrence rather than outright rejection—highlighting heterogeneity in both credit need and the decision to apply (Islam & Rodriguez, 2023). Where institutional quality is weak, credit constraints have stronger real effects: for example, firms' importing margins respond more elastically to financing constraints in lower quality institutional environments (Nucci, 2020). Credit frictions also propagate

to firm level trade outcomes: among Chinese SMEs, rationing reduces export participation by 15–40 percent and export values by 20–29 percent (Cheng, 2019). Gender gaps are similarly salient: evidence from India shows that women led firms face higher discouragement, driven more by procedural hurdles than price differentials (Ghosh, 2023). At the firm margin, SMEs adjust employment and wage policies in response to constraints, while discouraged firms often resemble unconstrained peers—implying distinct real effects channels (Bach, 2021).

This gap is particularly evident in Kenya, where SMEs account for substantial employment and output, yet credit markets are characterized by informality, opacity, and high transaction costs. Institutional frictions amplify financial constraints. In Sub Saharan Africa, higher “bribe taxes” distort investment, with effects concentrated among firms lacking credit lines; a one percentage point increase in the bribe share of sales reduces investment by about 5.3 percent for firms without credit (Okumu, 2025). Kenya thus provides a compelling empirical setting in which to examine discouraged borrowing and rationing. The 2024 CBK MSME Access to Credit Survey reports that MSMEs number more than 7.4 million, employ 14.4 million people, and contribute roughly 34 percent of GDP. Banks reported 0.89 million active MSME loan accounts worth KSh 784.4 billion, or 21.4 percent of total credit. Yet distribution is skewed: microenterprises represent 80 percent of accounts but receive only 11 percent of loan value, while medium firms hold more than 60 percent of loan value with less than 10 percent of accounts. Borrowing costs remain high—16.4 percent in banks and 26.3 percent in microfinance institutions—and MSME

nonperforming loans reached KSh 149.8 billion in 2024, nearly one fifth of total NPLs. These figures underscore a coexistence of financial deepening and persistent exclusion, making Kenya central to testing rationing and discouragement in an African setting.

We ask three questions. First, how widespread are SME financing constraints in Kenya, and how do they vary by age, formality, female ownership, transparency, sector, size, and region? Second, to what extent does discouraged borrowing—as distinct from lender rejection—drive observed rationing? Third, which firm characteristics predict application, and do those same characteristics reduce approval, conditional on applying? Using Kenya’s 2018 World Bank Enterprise Survey, we quantify discouragement, approval (including partial approvals), and heterogeneity across firm and geographic characteristics. The descriptive evidence reveals three central patterns. First, financing constraints are widespread: three quarters of firms report obstacles, and nearly one quarter cite major or severe constraints. Second, only one quarter apply for credit, with most non applicants deterred by high borrowing costs, collateral requirements, procedural burdens, or anticipated rejection. Third, approval rates among applicants exceed 90 percent—most in full or partial form—implying that rationing is driven predominantly by pre application discouragement, not post application denial. These patterns vary systematically by age, gender, formality, and transparency, indicating that constraints are shaped by underlying structural firm characteristics.

This paper contributes to the SME finance literature in three ways. First, it extends credit rationing frameworks by explicitly examining discouraged



borrowing as a distinct margin of exclusion and showing that self selection, rather than rejection, is the dominant constraint among Kenyan SMEs. While discouraged borrower behavior has been documented in high income and selected emerging economies (Kon & Storey, 2003; McCarthy et al., 2015; Hoque et al., 2016; Kallandranis & Drakos, 2021), systematic evidence for Africa and Kenya remains limited. Second, the analysis leverages firm level data to uncover heterogeneity in constraints across structural characteristics—including age, gender, formality, and transparency—situating Kenya within broader research on institutional frictions (Beck, Demirgüç Kunt, & Maksimovic, 2005; Nucci, Pozzolo,

& Schivardi, 2020; Yu, 2021). Third, by combining descriptive evidence with the predictions of Stiglitz and Weiss (1981), the paper adapts adverse selection models to African firm level realities, highlighting how constraints evolve over the firm life cycle and under conditions of informality and weak enforcement. In turn, the results contribute to ongoing debates on how to relax frictions and expand SME credit for inclusive growth. The remainder of the paper is structured as follows. Section 2 reviews theory and evidence on credit rationing and discouraged borrowing. Section 3 describes the data. Section 4 presents the empirical methodology and results. Section 5 concludes with policy implications.

2.0 Review of Related Literature

2.1 Theoretical Literature Review

The theory of credit rationing departs from the classical loanable funds paradigm by emphasizing that, under asymmetric information, markets may not clear through interest rate adjustments alone. Stiglitz and Weiss (1981) show that higher lending rates worsen the composition of borrowers through adverse selection and incentivize riskier project choice through moral hazard, producing a non monotonic expected return function and equilibria with involuntary credit rationing.

Relatedly, Akerlof's (1970) lemons logic underscores how price alone cannot sort private information, while the de Meza and Webb (1987) critique clarifies conditions under which informational frictions may instead yield over investment—highlighting that whether rationing or over lending arises is ultimately an empirical matter. This framework is particularly relevant in Sub Saharan Africa, where SME borrowers frequently lack audited financial records and collateralizable assets, deepening information asymmetries (Hoque et al., 2016).

Collateral has been theorized as both a screening and incentive device. In Bester's (1985) signaling model, low risk borrowers self select into high collateral, low interest contracts, while high risk borrowers accept low collateral, high interest terms. Yet Besanko and Thakor (1987) show that when collateral is illiquid or low valued, separation breaks down, leaving medium risk borrowers disproportionately rationed. Moreover, when lenders rely excessively on collateral, screening can be crowded out—weakening information acquisition and potentially worsening allocative efficiency (Manove, Padilla, & Pagano, 2001). This insight maps onto African SMEs operating in asset light sectors such as services and trade, where firms cannot credibly signal quality due to limited fixed assets (Nucci, 2020). Townsend's (1979) costly state verification model, and



its extensions by Williamson (1986, 1987), embed monitoring costs into rationing theory, showing that lenders facing high verification and enforcement costs optimally limit loan sizes or exclude borrowers altogether. In developing country settings with weak judicial enforcement, high transaction costs exacerbate rationing, raising the hurdle for SMEs (Yu, 2021). Consistent with this, institutional and information infrastructure approaches find that stronger creditor rights, modern collateral registries (secured transactions reform), and comprehensive credit information systems reduce screening and enforcement costs, lower default, and expand credit (Berger & Udell, 2006; Love & Mylenko, 2003; Djankov, McLiesh, & Shleifer, 2007; Safavian & Sharma, 2007). Parallel institutional approaches highlight that strong creditor rights, collateral registries, and credit information systems lower screening and enforcement costs, reducing the incidence of rationing (Berger & Udell, 2006; McCarthy et al., 2015). By contrast, weak institutions, shallow financial systems, and informality expand the rationing boundary (Bellier et al., 2012).

A further extension of rationing theory addresses discouraged borrowers, firms that self exclude from the loan application process due to perceived low approval probability or prohibitive lending terms (Kon & Storey, 2003). Empirical studies suggest that discouraged SMEs are often twice as numerous as rejected ones (Kallandranis & Drakos, 2020), implying that selection bias arises if credit constraints are measured solely from observed application outcomes. Evidence from mature markets shows that discouragement is systematically related to informational opacity and past borrowing experiences (e.g., Han, Fraser, & Storey, 2009; Fraser, Bhaumik, & Wright, 2015), reinforcing the need to measure

the extensive margin, not only realized denials. Discouragement thus constitutes an extensive margin constraint, functionally equivalent to rationing, but largely unobservable in administrative data. In the African context, discouragement is compounded by weak financial literacy, gender disparities in collateral ownership, and thin lender networks, particularly in rural markets (Cheng, 2019; Hoque et al., 2016). Taken together, the literature implies that discouragement will be more prevalent where (i) application costs and perceived rejection risk are high, (ii) collateral-based screening dominates information-based lending, and (iii) registries and bureaus are incomplete.

Taken together, these theoretical perspectives converge on three predictions highly pertinent to African SMEs: (i) asymmetric information and collateral scarcity intensify adverse selection and moral hazard risks, leading to involuntary rationing; (ii) weak enforcement institutions and high monitoring costs raise the probability of both quantity and risk rationing; and (iii) discouragement systematically excludes firms at the extensive margin, even in the absence of outright rejection. We therefore expect younger, unaudited, informally registered, and women owned firms—characterized by higher opacity and weaker collateral positions—to exhibit both higher discouragement and higher measured constraints; conversely, improvements in credit information and collateral regimes should attenuate both margins of rationing (Berger & Udell, 2006; Love & Mylenko, 2003; Djankov et al., 2007). These mechanisms frame the empirical analysis of Kenyan SMEs, where informality, limited collateral, and institutional weaknesses are central to understanding credit rationing and discouraged borrowing.

2.2 Empirical literature review

Research on SME access to finance is abundant but fragmented across data sources, regions, and identification strategies. Building on Stiglitz and Weiss (1981), recent empirics show that the incidence and margins of credit constraints vary systematically with firm heterogeneity (size, age, opacity), institutions (legal rights, collateral and credit information systems), and borrower behavior (discouragement and selection into application) (Ayyagari, DemirgüçKunt, & Maksimovic, 2017; Kuntchev, Ramalho, RodríguezMeza, & Yang, 2013). However, data gaps persist in developing economies, where informal firms and discouraged borrowers are underrepresented in administrative records, biasing inferences if one observes only applications and rejections (Kuntchev *et al.*, 2013).

Firm Size and Age. Larger and older firms typically face lower rationing probabilities due to reputational capital, collateralizable assets, and credit histories (Berger & Udell, 1998; Beck *et al.*, 2011). Enterprise Survey–based measures confirm that SMEs are more likely to be partially or fully constrained than large firms across 100+ countries; small firms substitute toward trade credit and informal finance when bank credit is tight. (Kuntchev *et al.*, 2013) European evidence indicates rejection gaps for small firms of up to ~20 percentage points; similar sizeage gradients are reported in Australia and Asia, with young firms especially constrained by weak collateral and cash flow (McNamara, O’Donohoe, & Murro, 2020; McCarthy, Oliver, & Song, 2015; Cao, 2019).

Ownership and Gender. Genderbased disparities are robust. Femaleowned firms are more constrained

owing to assetownership gaps, network exclusion, and perceived risk premia; crosscountry studies and country cases (e.g., Vietnam, India) show lower approval amounts and higher exclusion probabilities for womenled SMEs, especially in the informal sector (Aterido, Beck, & Iacovone, 2013; Cao, 2019; Raj, 2018). Recent multicountry evidence further links persistent rationing among womenowned SMEs to structural differences in asset titling and weak informational networks (Nlemvo & Bouslama, 2025).

Governance, Transparency, and Information Infrastructures. Formalization (registration), audited accounts, and quality disclosure mitigate opacity and reduce measured constraints; effects intensify where legal enforcement is stronger (McKenzie & Woodruff, 2008; McNamara *et al.*, 2020) World Bank work emphasizes that credit information sharing and legal rights materially lower the likelihood of being constrained, with the strongest benefits for smaller, unaudited, and uncertified firms (Ayyagari, DemirgüçKunt, & Maksimovic, 2017). At the system level, barriers to banking (documentation, minimum balances, fees) are tightly associated with weaker information sharing and legal rights, and with more restrictive bank regulations. (Beck, DemirgüçKunt, & Martínez Pería, 2008) Evidence on secured transactions further shows that modern collateral registries (for movables) expand credit and reduce costs, with outsized gains for SMEs (World Bank, 2019; World Bank brief, 2015).

Sector and Geography. Sectoral tangibility and cashflow volatility shape lenders’ willingness to extend credit: manufacturing (more tangible assets) is less rationed than services/agriculture, while innovationintensive but collateralpoor regions



display higher constraint rates. (Cao, 2019; Yu, 2021) Geographic disparities also matter: urban SMEs benefit from proximity, lower transaction costs, and denser lender networks (Fafchamps & Schündeln, 2013).

Social Capital, Certification, and Bank Relationships. Nonfinancial signals can substitute for collateral: cooperative membership, trade associations, and international certifications (e.g., ISO) enhance credibility and loan approval odds (Klonner & Rai, 2008; Bigsten *et al.*, 2003). Relationship lending mitigates rationing where soft information is accumulated; SMEs with stronger bank ties are less likely to be discouraged or denied (McCarthy *et al.*, 2015; Wernli & Dietrich, 2022).

Export Orientation, Innovation, and Growth. Exporting SMEs accumulate reputational capital and diversify revenues, improving creditworthiness; rationing is lower in countries with deeper finance and better information infrastructure. (Manova, 2013; Nucci, 2020) Yet innovation's intangibility undermines collateralization; evidence from China shows rationing suppresses productivity via the innovation channel, particularly for firms lacking real estate assets (Hall & Lerner, 2010; Yu, 2021).

Discouraged Borrowers (Demand Side Selection). Beyond rejections, self-exclusion ("discouragement") is a central, often larger, margin of rationing. Kon and Storey (2003) formalize discouragement as good firms not applying due to expected denial; U.S. and international evidence shows that riskier borrowers are more likely to self-exclude, but many creditworthy SMEs also

refrain from applying due to high collateral demands and procedural complexity (Han, Fraser, & Storey, 2009). In Europe and Eastern Europe, discouraged firms frequently outnumber rejections; firms cite high interest rates, collateral, and burdensome procedures (Brown, Ongena, Popov, & Yesin, 2012). For Switzerland, discouraged SMEs are roughly six times as numerous as rejected ones, and conservative prediction suggests about 60% would have been approved had they applied—implying inefficient self-rationing (Wernli & Dietrich, 2022). World Bank Enterprise Surveys—based work likewise cautions that measuring constraints solely from observed applications understates exclusion, since nonapplicants include both the truly unconstrained and the discouraged (Kuntchev *et al.*, 2013).

Two robust regularities emerge. First, SME disadvantage is pervasive after conditioning on observables: smaller firms are more likely to be partially or fully constrained, while higher labor productivity is associated with lower constraints; firm age per se is not a universal predictor once size and productivity are controlled (Kuntchev *et al.*, 2013). Second, institutions matter. Stronger creditor rights, better credit information systems, and modern secured transactions regimes are associated with lower constraint probabilities—especially for opaque SMEs (Ayyagari *et al.*, 2017) Complementary multiregion analyses confirm that improving credit information, legal enforcement, and competition closes SME inclusion gaps in financially shallow regions (IMF, 2020). Overall, the empirical literature implies three testable predictions for African (and Kenyan) SMEs: (i) smaller, younger, informal, unaudited, and women-owned firms—i.e., those with higher opacity and weaker collateral—are more

likely to be (partially) constrained and discouraged; (ii) improvements in creditor rights, collateral registries for movables, and credit information reduce both rationing and discouragement, with the largest gains for opaque SMEs; and (iii) measured “high

approval rates” among applicants can coexist with pervasive rationing if discouragement dominates at the extensive margin (Ayyagari *et al.*, 2017; Kuntchev *et al.*, 2013; Brown *et al.*, 2012; Wernli & Dietrich, 2022).

3.0 Methodology

3.1 Theoretical framework

We model SME credit access as a twostage decision under asymmetric information. At the extensive margin, the firm chooses whether to apply for credit; at the intensive margin, the lender decides whether to approve (fully or partially) and on what terms. Consistent with classic rationing theory, Stiglitz and Weiss (1981) show that raising loan rates can worsen borrower selection and incentives, implying that markets need not clear by price.

Collateral and contract design shape screening and incentives—Bester (1985) via separating contracts and Besanko and Thakor (1987) via the limits of separation when collateral is illiquid—while credible disclosure shifts posteriors and enforcement. A third, demandside margin—discouraged borrowing—arises when expected rejection, high perceived costs, or procedural hurdles push viable firms to selfexclude before applying (Kon & Storey, 2003; Han, Fraser, & Storey, 2009).

We treat information opacity—lack of audited financials, informality, thin or absent credit histories—as a core driver of both discouragement and lender risk assessments. On the demand side, opacity lowers the perceived probability of success and raises expected application costs, reducing application rates. On the supply side, opacity raises screening costs and lossgivendefault, tightening collateral and pricing requirements and depressing approval odds. Evidence from World Bank Enterprise Surveys (WBES) and PRWPs shows that smaller/opaque firms are more likely to be partially or fully constrained and rely more on informal finance, with constraints attenuated where credit information systems and legal rights are stronger (Kuntchev, Ramalho, RodríguezMeza, & Yang, 2013; Ayyagari, DemirgüçKunt, & Maksimovic, 2017). Collateral access—including movableasset pledging supported by modern securedtransactions frameworks and electronic collateral registries—relaxes enforcement constraints and can lift both margins (World Bank, 2019; World Bank, 2015). Firm traits (age, gender of ownership, formality, size, sector) therefore enter as proxies for informational quality, asset tangibility, and bargaining power; institutional features (credit

information systems, collateral registries, contract enforcement) moderate these relationships by lowering screening and enforcement costs (Ayyagari *et al.*, 2017; Beck, DemirgüçKunt, & Martínez Pería, 2008). Operationally, firm characteristics shape the quality of information and the availability of collateral, which in turn influence expectations and application costs. These factors govern the decision to apply, trigger lender screening and contract terms, and ultimately determine real outcomes such as investment, employment, and sales. We implement this with WBES-consistent constructs: (i) discouraged borrower status (did not apply due to fear of rejection/costs), (ii) application decision, (iii) approval outcome (full/partial/denied), and (iv) constraint severity. This structure guides the empirical strategy, clarifies mechanisms, and aligns policy simulations with the margins where frictions bind.

The framework delivers a set of sharp testable predictions about how asymmetric information and collateral frictions shape SME credit outcomes. First, financing constraints should be pervasive, with their severity varying systematically with informational opacity, collateral scarcity, and lender screening costs. Firms with thin credit histories, limited verifiable documentation, or low tangibility assets face steeper supply curves even when credit demand is strong. Second, discouragement should constitute a major margin of rationing: when SMEs anticipate high rejection risk or burdensome application costs, they self-select out of the market despite nontrivial approval rates among applicants. This disconnect between latent demand and observed applications aligns with the Stiglitz–Weiss (1981) prediction that price cannot

clear markets under adverse selection. Third, younger, informal, female-owned, and unaudited firms should exhibit higher discouragement and lower conditional approval odds, since these characteristics proxy for limited collateral, thin financial histories, weaker networks, and elevated informational asymmetry—mechanisms consistently documented in SME credit rationing studies across developing economies.

Fourth, credible information and collateral substitutes should attenuate these frictions: audited financial statements reduce uncertainty about firm quality; formal registration enhances legal enforceability; credit information footprints facilitate lender learning; and movable asset pledges expand collateralizable wealth for asset-light SMEs. Each mechanism reduces screening costs and increases both application probabilities and approval rates. Fifth, the relative importance of frictions should tilt toward preapplication deterrence where opacity is acute and registry infrastructure is weak. Conversely, where credit bureaus and collateral systems function well, rationing should shift toward postapplication adjustments—such as partial approvals or stricter collateral ratios—rather than outright discouragement. Finally, policy interventions—including partial credit guarantees, stronger credit information systems, modern secured transactions frameworks, and subsidized financial disclosure—are most effective when targeted to the binding margin of friction. When discouragement dominates, lowering application costs and improving borrower visibility is essential; when denials or partial approvals dominate, enhancements to collateral frameworks and risk sharing mechanisms yield greater returns.

3.2 Econometric approach

Our empirical framework exploits both the discrete nature of the credit rationing decision and the joint determination of loan application and approval outcomes. Following the conceptual approach of Jaffee and Russell (1976) and Stiglitz and Weiss (1981), we define a firm as *credit constrained* if it either (i) applied for a loan but was rejected, or (ii) self-reports being discouraged from applying due to anticipated rejection. This two-stage selection process motivates a bivariate probit specification. Let y_{1i}^* denote the latent propensity for firm i to apply for credit, and the latent propensity to be approved conditional on application. We specify:

$$y_{1i}^* = X_{1i}' \beta_1 + \varepsilon_{1i}, \quad y'_{1i} = 1 \text{ if } y_{1i}^* > 0$$

$$y_{2i}^* = X_{2i}' \beta_2 + \varepsilon_{2i}, \quad y'_{2i} = 1 \text{ if } y_{2i}^* > 0$$

The vector X_{1i} includes firm-level characteristics influencing application incentives (size, age, ownership, export status, managerial experience, audited accounts, sector and region dummies), while X_{2i} incorporates collateral value, credit history, and relationship lending indicators, which are hypothesized to influence approval conditional on application with $(\varepsilon_{1i}, \varepsilon_{2i}) \sim N(0, 0, 1, 1, \rho)^2$, allowing correlation between unobservables in the application and approval equations. A statistically significant ρ indicates that the two processes are not independent, validating the joint estimation. Identification is achieved through both functional form and exclusion restrictions.

We operationalize five outcomes from the WBES to capture both observed and latent margins of exclusion: financing need (loan/line-of-credit required), application, approval intensity (denied/partial/full), constraint severity (none–severe), and two discouraged-borrower measures among non-applicants with need because rationing frequently arises before application and is otherwise undercounted (Kon & Storey, 2003; Brown, Ongena, Popov, & Yesin, 2011; Han, Fraser, & Storey, 2009; Wernli & Dietrich, 2022). Explanatory variables reflect canonical information–collateral–cost channels. Firm age (log years) and sales (log revenue) proxy reputational capital, collateralizable assets, and internal liquidity that raise application and approval while lowering perceived constraints (Berger & Udell, 1998; Beck, Demirgüç-Kunt, & Maksimovic, 2005). Female ownership captures robust gender gaps in approval and discouragement linked to asset inequality and networks (Aterido, Beck, & Iacovone, 2013; Ghosh, 2023). Formality (registration) and audited financials reduce opacity and risk premia (McKenzie & Woodruff, 2008; McCarthy, Oliver, & Song, 2015; McNamara, O'Donohoe, & Murro, 2020). Legal status (incorporation), international certification, website, and association membership act as credibility and network signals that substitute for collateral and support relationship lending (Spence, 1973; Bigsten et al., 2003; McCarthy et al., 2015). Ownership concentration (log) is included with an a-priori ambiguous sign—control can aid

1. The error terms $(\varepsilon_{1i}, \varepsilon_{2i})$ are assumed to follow a bivariate normal distribution with zero means, unit variances, and correlation ρ : $((\varepsilon_{1i}, \varepsilon_{2i})) \sim N(0, 1, 1, \rho)$

monitoring, but undiversified owners may face tighter liquidity constraints (Jensen & Meckling, 1976). Sector dummies (food; textiles/garments; chemicals/pharma/plastics; other manufacturing; retail; tourism) absorb technology, tangibility, and volatility that shape collateral and screening costs (Cao, 2019; Tran, 2021; Nucci, 2020). Location dummies (Mombasa, Kilifi, Machakos, Kirinyaga, Kiambu, Trans-Nzoia, Uasin Gishu, Nakuru, Kisumu) proxy spatial frictions and bank-market access that affect both application costs and supply-side thresholds (Fafchamps & Schündeln, 2013). Together, these variables align with credit-rationing theory under asymmetric information and let us map firm heterogeneity to discouragement and approval margins (Stiglitz & Weiss, 1981).

Following Maddala (1983) and Greene (2018), we exclude at least one variable from β that is present in α and vice versa. Credible exclusions strengthen identification beyond functional form. Variables that shift participation costs and expectations but do not directly alter the bank's conditional decision serve as instruments in the application equation. We use business association membership which lower search and processing costs and improve expectations about approval yet should have limited direct influence once an application is filed and the lender observes financials, collateral, and firm characteristics. Variables that shift conditional screening but plausibly do not move initial application enter only the approval equation. We existence of an overdraft facility, and audited financials when excluded from the application equation. Shared controls appear in both equations. We include firm size dummies, age dummies, formality, female ownership, export status, region and sector fixed effects. This allows the likelihood function:

to be point-identified, where σ and ρ is the standard bivariate normal CDF. The bivariate probit is estimated via maximum likelihood, yielding consistent and asymptotically efficient parameter estimates under the maintained assumptions. Marginal effects are computed for substantive interpretation, recognizing that in nonlinear models with interaction through the error correlation, the marginal effects differ from the coefficients. We report both direct marginal effects and cross-equation effects to quantify how changes in the covariates affect the joint probabilities of applying for and being rationed in credit markets.

3.3 Data sources and description

We use firmlevel microdata from the 2018 Kenya Enterprise Survey (ES), conducted by the World Bank between May 2018 and January 2019. The ES is part of a standardized global program that collects comparable firmlevel data on business practices, constraints, and performance across the nonagricultural formal private sector. The Kenya survey covers establishments in manufacturing, construction, services, transport, storage, and informationtechnology and communications, while excluding agriculture, public administration, utilities, financial intermediation, real estate (other than IT services), and nonprofit organizations. The sampling frame combines the 2013 ES panel with updated business listings from the Kenya National Bureau of Statistics. A stratified random sampling design was used, with strata defined by industry (seven subsectors), firm size (small: 5–19 employees; medium: 20–99; large: 100+), and region (ten administrative areas). Within each stratum, firms were randomly selected to ensure representativeness across Kenya's production structure and geographic

distribution. Of 3,178 contacted establishments, 1,251 were eligible and 1,001 completed the interview, yielding a response rate consistent with other ES waves in lowermiddleincome countries. Data collection followed a twostage screening process and inperson interviews using sectorspecific survey instruments aligned with global ES standards. All monetary variables refer to the 2017 fiscal year and are expressed in Kenyan Shillings, ensuring consistency in financial reporting across firms.

Table 1: Definition of Variables and Measurements

Variable	Definition of Variables
Financing need	Firm reports a need for a loan/line of credit in the last fiscal year. "No need"
Applied for credit	=1 if the firm applied for a loan/line of credit; 0 otherwise.
Approval outcome	0 = denied; 1 = partially approved; 2 = fully approved.
Constraint severity	Perceived financing obstacle: 0 = none; 1 = minor; 2 = moderate; 3 = severe.
Discouraged borrower	Among non-applicants with need =1 if the main reason for not applying is expected rejection / would not be approved, interest rates too high, collateral requirements too high, application procedures too complex, loan size/maturity insufficient; 0 otherwise.
Log firm age	Log of firm age (years)
Logsale	Log of annual sales
Female ownership	= 1 if a firm is female owned, 0 otherwise
Formality	= 1 if a firm is formally registered, 0 otherwise
financials audited	= 1 if firm's financials statements are audited, 0 otherwise
Legal status	= 1 if the firm is incorporated, 0 otherwise
International certification	=1 if Firm holds an international certification, 0 otherwise
Website	= 1 if a firm has a website, 0 otherwise
Membership association	= 1 if the firms is a member of a business association
Log ownership concentration	Log of ownership concentration
Food	= 1 if the firms are in the food industry, 0 otherwise
Textile garments	= 1 if the firms are in the textiles/garments, 0 otherwise
Chemicals, Pharmaceuticals and plastic	= 1 if the firms are in the chemicals/pharmaceuticals/plastics, 0 otherwise

Variable	Definition of Variables
Other manufacturing	= 1 if the firms are in other manufacturing, 0 otherwise
Retail	= 1 if the firm in retail, 0 otherwise
Tourism	= 1 if firm in tourism, 0 otherwise
Mombasa	= 1 if firm located in Mombasa, 0 otherwise
Kilifi	= 1 if firm located in Kilifi, 0 otherwise
Machakos	= 1 if firm located in Machakos, 0 otherwise
Kirinyaga	= 1 if firm located in Kirinyaga, 0 otherwise
Kiambu	= 1 if firm located in Kiambu, 0 otherwise
Transzoia	= 1 if firm located in Trans-Nzoia, 0 otherwise
Uasin Gishu	= 1 if firm located in Uasin Gishu, 0 otherwise
Nakuru	= 1 if firm located in Nakuru, 0 otherwise
Kisumu	= 1 if firm located in Kisumu, 0 otherwise

4.0 Findings and Discussions

Table 2 offers a sharp comparative snapshot of SMEs segmented by credit application outcomes, illustrating how firm size, governance attributes, and sectoral positioning shape the likelihood of full approval, partial approval, rejection, or withdrawal. The patterns reveal substantial heterogeneity consistent with asymmetric information and collateral constraint models, where even modest differences in observability or asset structure translate into meaningful variation in credit outcomes. Firms receiving full approvals are systematically larger and more commercially developed—averaging 35.6 employees versus 21.5 in the full sample—and report sales levels several times higher. Their higher prevalence of audited accounts and international certification indicates that both scale and verifiable information quality lower screening costs for lenders. These firms therefore align most closely with the “safe borrower” profile predicted in adverse selection models.

Partially approved firms are smaller, exhibit lower certification uptake, and operate with substantially thinner liquidity. Their elevated rates of association membership suggest that network capital compensates partially for weaker formal disclosure, enabling firms near lenders’ indifference thresholds to obtain at least conditional financing. Partial approval thus appears less as a sign of rationing and more as a contractual adjustment to residual risk. Rejected firms, while not the smallest, present weaker disclosure practices—particularly in audited financial coverage—and cluster disproportionately in sectors characterized by high volatility or low tangibility collateral, such as chemicals, pharmaceuticals and plastics, and tourism. These industries face either demand cycles driven by weather and seasonality (tourism) or production processes requiring regulatory compliance and specialized machinery (chemicals/pharma), both of which elevate lenders’ perceived variance of returns. The concentration of rejections in these sectors indicates that lenders price sector-embedded volatility alongside firm-level risk.

The smallest and lowest turnover SMEs are those that withdrew applications. Despite their limited scale, these firms exhibit unusually high rates of audited

accounts and certification, suggesting that withdrawal reflects a mismatch between contract terms—collateral demands, rigid maturities, or procedural requirements—and the operating constraints of very small firms, rather than informational opacity alone. Overall, the descriptive evidence highlights three robust regularities. First, scale yields a significant advantage: larger SMEs face substantially lower effective rationing. Second, governance attributes—audits, certification, formal ownership structure—correlate strongly with full approvals, underscoring the

value lenders place on credible, lowcost information. Third, sector affiliation is a major driver of rationing intensity, with SMEs in food processing, tourism, and chemicals/pharmaceuticals/plastics overrepresented among rejections and withdrawals due to heightened volatility, regulatory demands, and collateral scarcity. Taken together, these results suggest that Kenyan SME credit markets exhibit layered frictions in which size, information, and sectoral risk each impose distinct thresholds for passing lender screening—patterns fully consistent with creditrationing theory.

Table 2: Descriptive Statistics of SMEs by Credit Application Outcome

Variable	Full Sample	Application Approved in Full	Application Approved in Part	Application Rejected	Application Withdrawn
Female ownership	1.54	1.44	1.47	1.67	1.00
Employment	21.50	35.56	30.97	46.50	12.00
Annual sales (millions)	967	3,190	314	961	82.1
Age	- 22.23	- 23.30	- 20.31	- 9.17	- 21.25
Ownership	0.46	0.56	0.53	0.33	1.00
Formality	0.91	0.91	0.87	1.00	1.00
International certification	0.21	0.30	0.14	-	0.25
Membership association	0.38	0.43	0.55	0.33	0.75
Membership union	0.09	0.08	0.07	-	0.25
Financials audited	0.80	0.87	0.83	0.67	1.00
Food sub-sector	0.16	0.14	0.07	-	-
Textile garments sub-sector	0.06	0.07	0.10	-	-
Chemicals, Pharmaceuticals & plastic sub-sector	0.11	0.16	0.20	0.33	0.75

Variable	Full Sample	Application Approved in Full	Application Approved in Part	Application Rejected	Application Withdrawn
Other manufacturing sub-sector	0.19	0.21	0.10	0.17	0.25
Retail sub-sector	0.18	0.18	0.17	0.17	-
Tourism sub-sector	0.14	0.07	0.10	0.17	-
Other services sub-sector	0.17	0.18	0.27	0.17	-
Mombasa	0.10	0.12	-	-	-
Kilifi	0.07	0.05	0.07	0.17	0.25
Machakos	0.06	0.07	-	-	-
Kirinyaga	0.08	0.05	0.07	-	-
Kiambu	0.10	0.11	0.07	0.33	-
Transzoia	0.04	0.05	0.13	0.17	-
Uasin Gishu	0.07	0.04	0.10	-	-
Nakuru	0.10	0.07	0.07	-	-
Kisumu	0.08	0.08	0.10	-	-
Nairobi	0.31	0.37	0.40	0.33	0.75

4.1 Perceived Financing Obstacles and Firm Heterogeneity

Table 3 shows that perceived financing obstacles vary sharply across firm characteristics in ways consistent with asymmetric information and collateral constraint theories. Only 25.5% of SMEs report no obstacle, while 74.5% experience some constraint and nearly a quarter face major or very severe obstacles—patterns in line with credit rationing predictions (Stiglitz & Weiss, 1981; Bellier, Sayeh, & Serve, 2012). Younger firms report substantially higher major obstacles (35.7%) than mature firms (19.5%), reflecting age as a proxy for reputation, collateral accumulation,

and lender trust (Beck, DemirgüçKunt, & Maksimovic, 2005; Hoque, Sultana, & Thalil, 2016). Institutional status reinforces these patterns: informal SMEs face higher major obstacles (26.7% vs. 19.4%) and report fewer “noobstacle” responses, consistent with weaker enforceability and heightened perceived risk (McCarthy, Wang, & Jefferson, 2015; Kallandranis & Drakos, 2021). Gender disparities are also evident, with female-owned firms reporting more moderate and major obstacles than male-owned firms, mirroring cross-country evidence of gendered rationing linked

to asset gaps and discrimination (Aterido, Beck, & Iacovone, 2013; Yu, 2021). Transparency strongly mitigates perceived constraints. Firms without audited accounts face far higher major and very severe obstacles, consistent with the signaling role of disclosure (Myers & Majluf, 1984) and empirical evidence that transparency improves credit outcomes

(Cheng, 2019; Nucci, 2020)². Overall, the descriptive evidence indicates that perceived obstacles are not uniformly distributed but instead cluster predictably around age, informality, gender, and transparency—key dimensions known to condition lenders’ beliefs and borrowers’ expectations in creditconstrained environments.

Table 3: Self-Reported Obstacles to Access to Finance by Firm Characteristics

	Does not apply	No obstacle	Minor obstacle	Moderate obstacle	Major obstacle	Very severe obstacle
Overall sample (n=994)	0.2%	25.5%	26.2%	24.4%	20.2%	3.6%
Firm Age						
Under 3 years	0.0%	17.9%	25.0%	17.9%	35.7%	3.6%
3–5 years	0.9%	18.8%	28.6%	24.1%	23.2%	4.5%
Above 5 years	0.0%	27.0%	25.9%	24.5%	19.5%	3.2%
Formality						
Not formally registered	0.0%	18.9%	27.8%	23.3%	26.7%	3.3%
Formally registered	0.2%	26.2%	26.1%	24.4%	19.4%	3.7%
Ownership						
Female ownership	0.0%	24.3%	23.4%	27.8%	21.2%	3.3%
No female ownership	0.4%	25.9%	28.7%	21.6%	19.6%	3.7%
Audited Financials						
Not audited	0.0%	27.3%	22.2%	21.7%	22.2%	6.6%
Audited	0.3%	25.1%	27.2%	25.1%	19.6%	2.8%

2. Based on the above descriptive evidence, three stylized facts emerge: financing frictions are pervasive but systematically distributed across firm characteristics; rationing reflects theoretical mechanisms of adverse selection, collateral signaling, and costly verification; and policy instruments such as credit guarantees, collateral reforms, and stronger disclosure standards are essential to relaxing binding constraints and fostering SME growth in African markets (Bellier et al., 2012; McCarthy et al., 2015; Kallandranis & Drakos, 2021).



4.2 Credit Applications, Discouragement, and the Dynamics of Rationing among SMEs

Table 4 summarizes the distribution of credit applications, the reasons cited for non-application, and subsequent loan outcomes among SMEs, offering insights into both demand- and supply-side dynamics of credit rationing. Only one-quarter of SMEs applied for credit (24.6%) while three-quarters did not (75.4%). This reflects widespread self-exclusion from formal credit markets. Among non-applicants 59.9 percent reported no need for loans while 11.7 percent were discouraged by high interest rates, 5.6 percent by collateral requirements, 3.7 percent by complex procedures, and 3.6 percent by fear of rejection. These demand-side barriers illustrate how transaction costs, collateral constraints, and expectations of rejection suppress participation in credit markets, consistent with the equilibrium rationing framework of Stiglitz and Weiss (1981). Empirical evidence across countries confirms this mechanism. Kon and Storey (2003) and Brown et al. (2011) show that discouraged borrowers reduce observed loan demand despite viable projects. Studies in Bangladesh and Europe also document patterns of self-exclusion linked to risk rationing (Hoque et al., 2016; Mc Namara et al., 2020).

For the minority of firms that applied outcomes were largely favorable. 79.5 percent were approved in full and 12.6 percent in part while rejection accounted

for only 2.5 percent, withdrawals 1.7 percent, and pending cases 3.8 percent. This suggests that the main constraint lies not in denial *ex post* but in discouragement *ex ante*. Theoretically this reinforces credit rationing models where adverse selection and moral hazard induce lenders to set terms that screen out riskier borrowers before application (Stiglitz & Weiss, 1981). Evidence from developing and advanced economies supports this interpretation. Beck, Demirgüç-Kunt, and Maksimovic (2008) and Ghosh (2017) find that high approval rates coexist with widespread perceptions of exclusion, while McCarthy et al. (2017) show similar results for Australian SMEs. Recent studies extend this view by showing that credit rationing constrains firm-level outcomes such as innovation, exports, and growth, with SMEs in asset-light sectors and emerging markets disproportionately affected (Cheng, 2019; Yu & Fu, 2021; Nucci et al., 2021; Nlemvo & Bouslama, 2025). Taken together the evidence indicates that SME financing constraints are driven less by rejection at the point of application than by discouragement before application, underscoring the importance of reforms that lower borrowing costs, expand collateral substitutes, strengthen financial disclosure, and improve institutional lending infrastructure (Berger & Udell, 2006; Mc Namara et al., 2020).

Table 4: Credit Applications, Non-Application Reasons, and Loan Outcomes among SMEs

Category	Sub-category	Statistics
Applied for new loans/ credit (n=972)	Yes	24.6% (239)
	No	75.4% (733)
Reasons for not applying (n=733)	No need for a loan (sufficient funds)	59.9% (439)
	Application procedures too complex	3.7% (27)
Reasons for not applying (n=733)	Interest rates unfavorable	11.7% (86)
	Collateral requirements too high	5.6% (41)
	Loan size/maturity insufficient	2.6% (19)
	Did not think it would be approved	3.6% (26)
	Other	11.9% (87)
	Don't know (spontaneous)	1.1% (8)
Loan outcomes (n=239)	Approved in full	79.5% (190)
	Approved in part	12.6% (30)
	Rejected	2.5% (6)
	Withdrawn	1.7% (4)
	Still under processing	3.8% (9)

4.3 Credit Applications and Rationing Dynamics by Firm Characteristics

Table 5 presents credit application patterns across SME characteristics, illustrating how firm size, age, ownership structure, and sectoral affiliation influence the likelihood of applying for external finance. Credit application rates remain low, with only one-quarter of SMEs applying (24.6%) and three-quarters not (75.4%), consistent with widespread self-exclusion under credit rationing models (Stiglitz & Weiss, 1981; Kon & Storey, 2003). Application propensities vary systematically with age: 37.0% of firms under three years apply compared to 17.1% among 3–5-year firms and 25.1% of older firms, reflecting

initial necessity, transitional credit rationing, and eventual reputational gains (Beck, Demirgüç-Kunt, & Maksimovic, 2005; Hoque, Sultana, & Thalil, 2016). Although theory emphasizes informality as a constraint (North, 1990; La Porta & Shleifer, 2014), informally registered firms in Kenya report slightly higher application rates (25.8%) than formal firms (24.5%), suggesting that necessity-driven demand can offset formal access barriers. Similar evidence from Bangladesh and Vietnam shows that informal SMEs exhibit strong but rationed credit demand (Doan et al., 2010; Hoque et al., 2016).



Demand correlates positively with perceived obstacles, rising from 16.4% among unconstrained firms to 30.4% for those reporting major obstacles and 28.6% for very severe ones, consistent with self-selection dynamics where rationed firms seek external finance more actively (Beck & Demirgüç-Kunt, 2006; Nucci, Pozzolo, & Schivardi, 2020). Ownership and transparency reinforce these dynamics. Female-owned firms apply at higher rates (29.4%) than male-owned (20.5%), consistent with gender-based financing gaps where women entrepreneurs seek external credit to compensate for smaller capital bases and weaker networks (Aterido, Beck, & Iacovone, 2013; Yu, 2021). Similarly, audited firms are more likely to apply (26.8%) compared to unaudited ones (16.1%), reflecting the value of credible disclosure in lowering adverse selection and moral hazard (Myers

& Majluf, 1984; McCarthy et al., 2015). Cross-country evidence supports these findings, with European SMEs reporting higher application rates and lower rejection probabilities when audited (Kallandranis, 2021; Bartoli et al., 2014). Taken together, the evidence suggests that SME financing constraints are not primarily the product of outright rejection but are shaped by firm age, informality, ownership, and transparency. This pattern is consistent with global findings that discouraged borrowers constitute the dominant margin of exclusion (Bellier, Sayeh, & Serve, 2012; Beck, Demirgüç-Kunt, & Maksimovic, 2008), underscoring the need for reforms that expand collateral substitutes, strengthen credit registries, and incentivize transparent reporting to integrate marginalized firms into formal credit markets.

Table 5: Credit Application Patterns across SME Characteristics

Category	Sub-category	Yes (%)	No (%)
Overall	Total sample	24.6	75.4
	Under 3 years	37	63
Firm Age	3–5 years	17.1	82.9
	Above 5 years	25.1	74.9
Formality	Not formally registered	25.8	74.2
	Formally registered	24.5	75.5
Self-reported perceptions on credit constraints	No obstacle	16.4	83.6
	Minor obstacle	22.2	77.8
	Moderate obstacle	31.1	68.9
	Major obstacle	30.4	69.6
	Very severe obstacle	28.6	71.4
Ownership	Female-owned	29.4	70.7
	Male-owned	20.5	79.5

Category	Sub-category	Yes (%)	No (%)
Audited Financials	Not audited	16.1	83.9
	Audited	26.8	73.2

4.4 Discouraged Borrowers and the Determinants of Non-Application among SMEs

Table 6 reports the incidence of credit discouragement and the distribution of non-application reasons across SME characteristics, highlighting the firm-level factors associated with self-exclusion from formal credit markets. Among SMEs that did not apply for credit, most (59.7%) reported no need, but significant shares cited interest rates (11.7%), collateral requirements (5.6%), application complexity (3.7%), and fear of rejection (3.4%). This pattern reflects discouraged borrower behavior, consistent with Stiglitz and Weiss’s (1981) equilibrium rationing model, where high expected rejection probabilities and costly loan terms deter firms from applying. The intensity of deterrents rises with perceived constraints. Only 4.9% of unconstrained firms cited interest rates, compared to 17.9% of moderately constrained and 18.5% of severely constrained firms, while collateral deterrence rose from 2.0% to 24.0% across the same gradient, confirming that firms experiencing stronger constraints are more likely to self-select out of the market. This self-selection mechanism aligns with adverse-selection and collateral-based rationing models (Stiglitz & Weiss, 1981) and is corroborated by cross-country evidence that SMEs facing higher financing costs are also the most credit-constrained (Beck & Demirgüç-Kunt, 2006; Banerjee & Duflo, 2014; Hoque, Sultana, & Thalil, 2016; Bellier, Sayeh, & Serve, 2012).

Firm heterogeneity sharpens these dynamics. Female-

owned SMEs report rejection rates of 5.1% versus 2.4% for male-owned and are more sensitive to collateral hurdles, echoing evidence of gendered rationing in African and Latin American contexts (Aterido, Beck, & Iacovone, 2013; Yu, 2021). Transparency also matters. Unaudited firms report collateral deterrence of 8.0% versus 4.9% for audited, and rejection fears of 6.2% versus 2.8%, underscoring the signaling role of financial disclosure (Myers & Majluf, 1984) and consistent with evidence from Europe and Australia that audited accounts improve access by reducing information opacity (McCarthy, Lok, & Morrissey, 2015; Carbó-Valverde, Rodríguez-Fernández, & Udell, 2009). Firm age further shapes perceptions. Firms under three years old report 17.7% sensitivity to interest rates, while survival-stage firms (3–5 years) show the highest rejection fears (7.6%). Older firms (>5 years) face reduced concerns (11.3% interest rate sensitivity, 3.1% rejection), confirming age as a proxy for reputation and collateral (Beck, Demirgüç-Kunt, & Maksimovic, 2005; Kallandranis & Drakos, 2021). Finally, informality amplifies exclusion. Informal firms report rejection rates of 12.1% compared to 2.7% for formal firms and cite “other” barriers at 19.7% versus 13.0%. In contrast, 60.1% of formal firms report no need for credit compared to 45.5% of informal ones, consistent with theories of weak contract enforceability (North, 1990) and evidence that informality heightens financing penalties (La Porta & Shleifer, 2014; Cheng, 2019; Nucci, Pozzolo, & Schivardi, 2020).



Table 6: Credit Discouragement and Non-Application Reasons across SME Characteristics (% of Firms)

Category	Sub-category	Don't know	No need	Applica- tion too complex	Interest rates unfavourable	Collateral too high	Loan size/ maturity insufficient	Did not think approved	Other
Overall	Total sample	1.0%	59.7%	3.7%	11.7%	5.6%	2.6%	3.4%	12.0%
	No obstacle	0.0%	78.9%	2.5%	4.9%	2.0%	0.5%	1.0%	8.8%
Credit Constraints	Minor obstacle	1.0%	65.5%	2.9%	9.8%	4.5%	1.5%	3.9%	10.8%
	Moderate obstacle	0.8%	53.8%	3.4%	17.9%	3.9%	4.3%	3.7%	11.7%
	Major obstacle	0.0%	38.1%	5.0%	18.5%	12.6%	5.2%	5.2%	16.3%
	Very severe obstacle	0.0%	44.0%	4.0%	16.0%	24.0%	4.0%	8.0%	12.0%
Ownership	Female- owned	1.6%	61.9%	2.2%	10.2%	5.1%	2.9%	5.1%	10.9%
	Male-owned	0.7%	57.9%	4.8%	12.8%	6.6%	2.4%	2.4%	12.8%
Audited Financials	Not audited	1.2%	48.8%	5.6%	13.0%	8.0%	3.7%	6.2%	13.6%
	Audited	0.9%	63.7%	2.6%	11.4%	4.9%	2.3%	2.8%	11.4%
Firm Age	Under 3 years	1.0%	35.3%	3.0%	17.7%	5.9%	1.0%	1.0%	35.3%
	3–5 years	1.9%	48.9%	4.8%	14.1%	10.9%	7.6%	7.6%	4.1%
	Above 5 years	0.9%	63.3%	3.3%	11.3%	4.9%	2.9%	3.1%	11.8%
Formality	Not formally registered	0.0%	45.5%	3.9%	9.9%	4.6%	6.1%	12.1%	19.7%
	Formally registered	1.2%	60.1%	3.6%	12.0%	5.2%	2.3%	2.7%	13.0%

Loan Approval Patterns and the Dynamics of Credit Rationing among SMEs

Table 7 summarizes loan outcomes across SME characteristics, capturing the intensivemargin dynamics of rationing among firms that apply for credit. Approval rates are high—82.6% receive full approval and 13.0% partial approval—while rejection (2.6%) and withdrawal (1.7%) remain rare. This pattern indicates that the binding constraint in Kenyan credit markets lies primarily *before* application rather than at the point of lender decision, consistent with the equilibrium rationing mechanism of Stiglitz and Weiss (1981). Approval rates, however, decline sharply with perceived obstacles: full approvals fall from 94.9% for unconstrained firms to 60.0% among those reporting very severe constraints, accompanied by increases in partial approvals (30.0%) and outright rejections (10.0%). These differences reflect the combined effects of adverse selection and collateralbased rationing highlighted in theory (Stiglitz & Weiss, 1981) and empirical studies (Beck & DemirgüçKunt, 2006; Banerjee & Duflo, 2014), and mirror firmlevel evidence from Europe and Asia, where severe constraints often result in contract adjustments instead of outright denial (Yu, 2021; Kallandranis, 2021; McCarthy *et al.*, 2015).

Firm heterogeneity further shapes loan outcomes. Femaleowned SMEs achieve similar fullapproval rates to maleowned firms (82.7% vs 82.2%) but withdraw more frequently (3.2% vs 0.0%), suggesting greater sensitivity to unfavourable contract terms and a higher likelihood of exiting negotiations—an outcome consistent with gendered rationing mechanisms documented in Africa and Latin America (Aterido, Beck, & Iacovone, 2013; Cheng, 2019). Transparency

also improves credit outcomes: audited firms secure 83.4% full approval compared with 77.4% among unaudited SMEs, and their rejection rates fall sharply (2.0% vs 6.5%), underscoring the signaling role of credible disclosure (Myers & Majluf, 1984; Beck, DemirgüçKunt, & Maksimovic, 2008).

Age patterning is equally pronounced. Firms under three years old obtain 70% full approval, but face rejection and withdrawal rates of 10% each; 3–5year firms fare worse, with only 50% full approval and 16.7% rejection; older firms (>5 years) perform best, with 85.6% full approval and rejection below 2%. These patterns highlight the dual function of age as a proxy for both survival and accumulated collateral, corroborating evidence that reputation and asset maturity ease lender concerns (Beck, DemirgüçKunt, & Maksimovic, 2005; Nucci, 2020).

Formality modestly improves outcomes: formal SMEs receive 82.5% full approvals with 2.9% rejection, while informal SMEs—although achieving comparable fullapproval rates (81.8%)—rely more heavily on partial approvals (18.2%). This reflects weaker enforceability in informal contracting environments (North, 1990) and is consistent with crosscountry findings that informality systematically increases rationing penalties (La Porta & Shleifer, 2014; Hoque *et al.*, 2016; Nlemvo & Bouslama, 2025). Informal firms, lacking complete documentation and legal enforceability, are more likely to receive conditional rather than full approvals, reinforcing the structural disadvantages embedded in their institutional status.

Table 7: Loan Outcomes and Rationing Patterns across SME Characteristics (% of Applicants)

Category	Sub-category	Approved in full	Approved in part	Rejected	Withdrawn
Overall sample	All firms	82.6%	13.0%	2.6%	1.7%
Credit Constraints	No obstacle	94.9%	2.6%	2.6%	0.0%
	Minor obstacle	92.7%	3.6%	1.8%	1.8%
	Moderate obstacle	78.9%	16.9%	1.4%	2.8%
	Major obstacle	72.7%	21.8%	3.6%	1.8%
	Very severe obstacle	60.0%	30.0%	10.0%	0.0%
Female Ownership	Female-owned	82.7%	12.6%	1.6%	3.2%
	Male-owned	82.2%	13.9%	3.9%	0.0%
Audited Financials	Not audited	77.4%	16.1%	6.5%	0.0%
	Audited	83.4%	12.6%	2.0%	2.0%
Firm Age	Under 3 years	70.0%	10.0%	10.0%	10.0%
	3–5 years	50.0%	33.3%	16.7%	0.0%
	Above 5 years	85.6%	11.0%	1.8%	1.5%
Formality	Not formally registered	81.8%	18.2%	0.0%	0.0%
	Formally registered	82.5%	12.6%	2.9%	1.9%

4.5 SME's Propensity of Credit Access

Table 8 presents probit estimates and marginal effects that isolate how firmlevel, governance, and sectorspecific characteristics shape the likelihood of accessing external finance, allowing us to distinguish informational frictions from structural sectoral risks. The probit specification captures the nonlinear contribution of firm attributes to credit access, consistent with earlier SME creditrationing studies across Europe, Asia, and Africa (Mc Namara, O'Donohoe, & Murro, 2020; Hoque, Sultana, & Thalil, 2016). The covariates

include canonical predictors—firm size, age, and female ownership—alongside information proxies such as audited financial statements, incorporation, certification, website presence, businessassociation membership, and ownership concentration. These variables represent distinct channels of informational quality and borrower credibility under asymmetric information. Firm size exerts a strong positive effect on credit access (marginal effect +0.029, $p < 0.01$), consistent with **Table 8** and with the idea that larger

firms are less informationally opaque, face lower monitoring costs, and are perceived as lower risk by lenders (Nlemwo & Bouslama, 2025). In contrast, firm age shows a negative marginal effect (-0.038 , $p < 0.10$), suggesting that younger firms lack credit histories while older stagnant firms face declining growth prospects, producing the inverse U relationship between age and discouragement observed elsewhere (Kallandranis & Drakos, 2020). Female-owned SMEs experience substantially lower access probabilities, confirming persistent gender disparities (Hoque *et al.*, 2016) and illustrating how informational frictions translate into systematic exclusion. Such constraints can also restrict innovative capacity and productivity growth (Yu & Fu, 2021).

Information proxies—audits, certification, and association membership—are directionally positive but statistically weak, implying that lenders discount formal signals when collateral and relationship-based markers provide stronger screening value. Sectoral patterns are pronounced. By contrast, sectoral coefficients show clear patterns: SMEs in food processing and tourism face markedly lower access, reflecting lender aversion to sectors characterized by seasonality, weather dependence, volatile demand, and low tangibility collateral. Evidence from China similarly shows that credit-constrained firms are less likely to export and innovate (Cheng, Tan, & Yu, 2019), while constraints also limit the ability to source intermediate inputs essential for

competitiveness (Nucci, Pietrovito, & Pozzolo, 2020). By contrast, firms in chemicals, pharmaceuticals, and plastics (CPP) show statistically insignificant but positive coefficients. This muted pattern likely stems from competing forces. On the one hand, CPP sectors involve higher technological sophistication, formalized production processes, and greater regulatory oversight all of which reduce information opacity and may improve perceived creditworthiness. On the other hand, these industries also require specialized equipment with low liquidation value, face volatile imported input prices, and operate under stringent compliance requirements, which can raise perceived credit risk. The net effect is therefore small and statistically insignificant in **Table 8**, reflecting these offsetting channels rather than the absence of credit-relevant sectoral risk. County-level differences remain modest overall, although SMEs in TransNzoia display a statistically significant positive premium. Plausible mechanisms include stronger penetration of cooperatives and SACCOs, localized lending programs, and more established agroprocessing networks that reduce information frictions and enhance lender familiarity with borrower cashflow cycles. Such localized institutional depth can improve approval rates even when broader geographical patterns appear weak. Broadly, this accords with findings from Australia, where industry and firm-specific factors dominate geography in explaining rationing (McCarthy, Oliver, & Verreynne, 2017).

Table 8: Probit Estimates and Marginal Effects for SME Access to Credit

Variable	Description	Probit Coefficient (Std. Err.)	Marginal Effect (Std. Err.)
Log firm age	Log of firm age (years)	-0.131 (0.071) *	-0.038 (0.020) *
Logsale	Log of annual sales	0.100 (0.027) ***	0.029 (0.007) ***
Female ownership	Dummy =1 if female-owned	-0.369 (0.107) ***	-0.106 (0.030) ***
Formality	Dummy =1 if firm is registered	-0.236 (0.174)	-0.067 (0.050)
financials audited	Dummy =1 if audited financials	0.182 (0.149)	0.052 (0.042)
Legal status	Legal form (Ltd/PLC)	0.108 (0.152)	0.031 (0.043)
International certification	Dummy =1 if certified	0.034 (0.138)	0.010 (0.039)
Website	Dummy =1 if firm has website	0.176 (0.115)	0.052 (0.034)
Membership association	Dummy =1 if in business association	0.150 (0.114)	0.028 (0.032)
Log ownership concentration	Log of ownership concentration	-0.017 (0.144)	-0.005 (0.041)
Food	Dummy =1 if food industry	-0.422 (0.196) **	-0.121 (0.054) **
Textile garments	Dummy =1 if textiles/garments	0.181 (0.245)	0.051 (0.070)
Chemicals, Pharmaceuticals & plastic	Dummy =1 if chemicals/pharma/plastics	0.177 (0.190)	0.053 (0.057)
Other manufacturing	Dummy =1 if other manufacturing	-0.213 (0.207)	-0.049 (0.048)
Retail	Dummy =1 if retail	-0.127 (0.170)	-0.036 (0.049)
Tourism	Dummy =1 if tourism	-0.517 (0.200) **	-0.149 (0.057) **
Mombasa	Dummy =1 if firm located in Mombasa	0.069 (0.189)	0.020 (0.054)

Variable	Description	Probit Coefficient (Std. Err.)	Marginal Effect (Std. Err.)
Kilifi	Dummy =1 if firm located in Kilifi	0.242 (0.249)	0.069 (0.071)
Machakos	Dummy =1 if firm located in Machakos	0.144 (0.228)	0.040 (0.065)
Kirinyaga	Dummy =1 if firm located in Kirinyaga	-0.090 (0.258)	-0.026 (0.074)
Kiambu	Dummy =1 if firm located in Kiambu	0.147 (0.187)	0.049 (0.062)
Transnzoia	Dummy =1 if firm located in Trans-Nzoia	0.278 (0.279)	0.278 (0.079) ***
Uasingishu	Dummy =1 if firm located in Uasin Gishu	-0.173 (0.239)	-0.050 (0.066)
Nakuru	Dummy =1 if firm located in Nakuru	-0.179 (0.198)	-0.050 (0.057)
Kisumu	Dummy =1 if firm located in Kisumu	0.301 (0.216)	0.086 (0.062)
Constant	Regression constant	-1.519 (0.856) *	—

5.0 Conclusion and Policy Implications

This paper examines discouraged borrowing and access to finance among Kenyan SMEs using firmlevel data from the 2018 World Bank Enterprise Survey. The evidence shows that exclusion arises primarily before application rather than through observable denial. Although applicants experience high approval rates, most SMEs report financing constraints, and only a quarter apply for credit. Among nonapplicants, deterrents such as high interest costs, collateral requirements, procedural complexity, and expected rejection are widespread, indicating that discouragement is the dominant margin of rationing.

Econometric estimates corroborate these patterns. Larger firms are more likely to access credit, while the relationship between firm age and credit access is concave once nonlinearity is introduced, suggesting disadvantages for both very young and older stagnant SMEs. Femaleowned firms face significant access penalties, consistent with genderbased rationing. Audits, certification, and association membership show limited explanatory power, implying that lending decisions continue to be driven primarily by collateral and relationship-based assessment. Sectoral heterogeneity persists (i.e. food and tourism) with SMEs face reduced access, while county differences are modest and appear localized.

The findings imply several policy priorities. First, lowering borrowing costs through targeted credit lines and blendedfinance mechanisms can reduce interestdriven discouragement. Second, collateral reforms—such as expansions of movableasset registries, partial credit guarantee schemes, and risksharing facilities—can broaden access for assetlight SMEs. Third, improvements in credit registries, securedtransactions systems, and judicial enforcement are needed to strengthen Kenya's lending infrastructure and make information signals more meaningful. Fourth, genderresponsive financial instruments, including dedicated guarantee windows and tailored products for womenowned firms, can mitigate persistent gender gaps. Fifth, sectorsensitive risksharing tools should target food

processing and tourism, where lender risk aversion is most pronounced. Finally, because earlystage MSMEs experience the highest discouragement rates, financial literacy and credit readiness initiatives tailored to young firms are essential for reducing ex ante application costs and building formal credit histories. Overall, the results indicate that

Kenya's SME financing gap stems more from ex ante discouragement than from ex post rejection. Policies that directly lower application costs, ease collateral frictions, strengthen information systems, and address gender and age related disadvantages have the greatest potential to improve credit participation and outcomes.



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Kenya Bankers Association

13th Floor, International House, Mama Ngina Street

P.O. Box 73100– 00200 NAIROBI

Telephone: 254 20 2221704/2217757/2224014/5

Cell: 0733 812770/0711 562910

Fax: 254 20 2221792

Email: research@kba.co.ke

Website: www.kba.co.ke



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