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By Rogers Ochenge

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MSME Partial Credit Guarantees in Kenya: What 28,000 Loans Reveal About Risk and Pricing

Rogers Ochenge

Abstract

Partial Credit Guarantees (PCGs) are central to MSME finance, yet their pricing impact is uneven. Using loan-level evidence from 28,356 guaranteed MSME loans issued in Kenya between 2013 and 2024, this paper examines whether PCGs reduce defaults and borrowing costs, and separately benchmarks Kenya's treasury-run Credit Guarantee Scheme (CGS) against international standards. The results show that higher coverage reduces default rates, especially in high-risk sectors such as agriculture and community services, and modestly lowers interest rates. However, when loans are already collateralized, the marginal benefit of guarantees is limited, and sectoral pricing disparities persist, suggesting that banks do not fully transmit risk-sharing gains to MSMEs. The comparative review highlights several design gaps in Kenya's treasury CGS: coverage is fixed rather than risk-based, allocation of guarantees is largely bank-driven, fees do not reflect borrower risk. These features contrast with leading international models such as the U.S. SBA 7(a) program, Korea's KODIT, and Chile's FOGAPE, which use tiered coverage, risk-based pricing, and stronger governance mechanisms. Overall, while PCGs in Kenya expand credit and reduce lender risk, they have not consistently lowered borrowing costs. Reforms that introduce flexible, risk-tiered coverage, risk-based fees and transparent allocation would align Kenya's system with global best practice and enhance its role in supporting MSME finance under Vision 2030.

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1.0 Introduction

Credit guarantees reshape the allocation of risk within the financial system, altering how intermediaries price, monitor, and extend credit. In economies with thin collateral markets and incomplete credit information, such as Kenya, partial credit guarantees (PCGs) have become an attractive risk-sharing mechanism between lenders and the public sector. Yet, despite their widespread adoption, the extent to which PCGs alter banks' intermediation behavior—through default outcomes, pricing dynamics, and portfolio allocation—remains poorly understood.

The literature on financial intermediation emphasizes how external risk-sharing instruments influence bank incentives and credit supply. Models by Diamond (1984) and Holmström and Tirole (1997) suggest that third-party guarantees can mitigate agency frictions but may also distort screening incentives and induce risk substitution. Empirical evidence remains mixed. Studies from developed markets (e.g., Boschi et al., 2014; Gozzi et al., 2018) find that guarantees enhance credit supply but have limited effect on pricing, while findings from emerging economies (e.g., Cowan et al., 2015; Leone & Vento, 2012) point to substantial heterogeneity across sectors and institutions. Few papers, however, have access to large loan-level datasets that can disentangle how guarantee design, collateralization, and sectoral risk jointly shape default and pricing behavior.

This paper contributes to the literature by examining how PCGs influence the dual objectives of risk mitigation and pricing efficiency in MSME lending. Using a unique administrative dataset of over 28,000 guaranteed MSME loans issued in Kenya between 2013 and 2024, the study estimates how guarantee coverage, collateral status, and sectoral characteristics affect default probabilities and lending rates. The analysis employs fractional logit and OLS frameworks to quantify the pass-through of risk sharing to loan pricing, while accounting for potential interaction effects between collateral and guarantees.

Beyond its empirical setting, the paper situates Kenya's PCG architecture within the broader debate on optimal design of guarantee schemes as instruments of

financial intermediation. The findings illuminate the conditions under which guarantees crowd in private credit versus when they merely reallocate risk without reducing borrowing costs. In doing so, the paper bridges the micro-evidence from MSME lending with macro-level discussions on credit market development and financial stability in emerging economies.

The results reveal that higher guarantee coverage significantly reduces default risk, particularly in high-risk sectors such as agriculture and community services, but that the pricing effect is incomplete—banks retain part of the risk-sharing gain rather than passing it to borrowers. The interaction between collateral and guarantees indicates a substitution effect, implying that collateralized lending remains the dominant pricing anchor. The paper concludes by benchmarking Kenya's guarantee scheme against international best practice and proposing design reforms that can enhance the efficiency and sustainability of public risk-sharing mechanisms

2.0 Literature review

2.1 Theoretical Foundations: Guarantees, Risk Allocation, and Financial Intermediation

In modern intermediation theory, guarantees are contractual mechanisms that reallocate credit risk across multiple agents—banks, public guarantee funds, and private or development finance institutions (DFIs). The seminal models of Diamond (1984) and Holmström and Tirole (1997) frame financial intermediaries as entities that monitor borrowers and manage risk more efficiently than dispersed investors. Partial Credit Guarantees (PCGs) extend this structure by introducing an additional layer of risk transfer from banks to third-party guarantors—whether public or private—thereby relaxing capital and risk constraints and potentially increasing the supply of credit.

When properly designed, such guarantees mitigate information asymmetries and credit rationing by enhancing the bank's ability to intermediate funds to informationally opaque borrowers (Stiglitz & Weiss, 1981). Yet the welfare outcome hinges on the guarantee's parameters. High coverage ratios or weak screening obligations may reduce banks' monitoring effort and induce borrower moral hazard, while moderate coverage can preserve incentives and improve allocative efficiency (Benmelech & Bergman, 2011; Anginer et al., 2014). Hence, PCGs serve as delegated monitoring complements only when risk sharing is structured to maintain effort and accountability across all parties.

Beyond the incentive channel, PCGs influence the intermediation margin by lowering expected losses and regulatory capital requirements. This affects both banks' portfolio composition and their pricing of risk, linking guarantees to broader themes of financial intermediation under capital regulation (Kashyap, Rajan & Stein, 2002; Allen & Gale, 2004). The inclusion of private and development finance institutions (DFIs) as guarantors further introduces hybrid arrangements where public objectives of inclusion interact with private risk management practices—a layered intermediation structure increasingly relevant in emerging markets.

2.2 Empirical Evidence: Credit Access, Risk, and Bank Behavior

Empirical evidence on PCGs reveals both credit-expanding and incentive-distorting effects. Cross-country studies (Beck, Klapper & Mendoza, 2010; Honohan, 2010) find that well-governed guarantees can substantially increase SME lending, particularly when additionality is enforced and losses are contained. Cowan, Drexler and Yáñez (2015) demonstrate that portfolio guarantees in Latin America improved credit access and reduced delinquency rates, while Gozzi, Schmukler and Varela (2018) link performance gains to programs with risk-based pricing and transparent governance.

Sectoral variation remains a defining feature. Jiménez and Saurina (2004) and Zecchini and Ventura (2009) show that defaults under PCGs vary sharply across industries due to differences in income volatility, enforceability, and collateral recoverability. In contexts such as agriculture or community services, structural risk limits the guarantee's capacity to reduce delinquencies. This sectoral heterogeneity underscores that guarantees are not generic de-risking tools but interact with deep credit market fundamentals.

A consistent empirical puzzle concerns incomplete pass-through: while guarantees reduce lender risk, they do not always translate into lower borrowing costs. Boschi, Girardi and Ventura (2014) and Dehejia, Montgomery and Morduch (2012) show that banks often retain the risk-sharing surplus rather than passing it to MSMEs through reduced interest rates. This suggests that guarantees may shift risk within the intermediation chain without altering equilibrium pricing—an inefficiency at the core of current policy debates.

2.3 Institutional Design and Multi-Party Risk Sharing

Institutional structure critically shapes outcomes. Public schemes such as the U.S. SBA 7(a), Korea's KODIT, and Chile's FOGAPE embed explicit governance, monitoring, and risk-based pricing mechanisms. The SBA program links coverage to borrower type and imposes tiered fees, while FOGAPE's auction-based allocation system rewards banks that assume higher exposure, minimizing rent-seeking (Leone & Vento, 2012; Beck et al., 2011). In contrast, many developing-country programs—including Kenya's—retain uniform coverage and fixed fees, which constrain fiscal sustainability and weaken incentive alignment.

The rise of DFIs and private guarantee providers (e.g., the African Guarantee Fund, Proparco-AFD's ARIZ, USAID's DCA, and the U.S. DFC) has added new dynamics. These institutions co-guarantee or reinsure loans alongside public programs, blending developmental mandates with market discipline. Their participation introduces additional layers of screening, monitoring, and performance evaluation, effectively transforming guarantees into multi-layered risk-sharing contracts that complement—rather than substitute—traditional intermediation. However, coordination failures or overlapping mandates can dilute incentive compatibility, emphasizing the need for clear governance hierarchies and transparent loss-sharing rules.

2.4 Research Gaps and Contribution

Despite extensive policy experimentation, two empirical gaps remain unresolved. First, few studies jointly analyze default outcomes and loan

pricing within the same micro-dataset, limiting understanding of how risk transfer mechanisms translate into intermediation margins. Second, the interaction between collateralization and guarantee coverage—and the extent to which these instruments act as substitutes or complements in lenders' risk models—remains empirically underexplored, particularly in developing and hybrid guarantee markets involving DFIs.

This paper addresses these gaps using a unique administrative dataset of 28,000 guaranteed MSME loans in Kenya (2013–2024) that spans public, private, and DFI-backed schemes. By linking coverage ratios, collateral status, and sectoral risk to both default probabilities and loan pricing, the study identifies how multi-party risk-sharing arrangements influence the dual objectives of risk mitigation and credit cost reduction. The findings contribute to financial intermediation theory by providing micro-evidence on how hybrid guarantee structures shape incentives, risk allocation, and market discipline in emerging credit markets.

3.0 Data and Methodology

3. 1 Data Source

This study uses a unique administrative dataset of 28,356 guaranteed loans disbursed to Kenyan MSMEs between 2013 and 2024. The data were obtained directly from a guarantee program that partners with commercial banks to share credit risk on SME lending.

The dataset provides loan-level information, including disbursement amounts, sector classification, interest rates, collateral status, guarantee coverage ratios, and default outcomes. Such granularity allows for systematic analysis of how guarantee design interacts with sectoral risk and loan characteristics to shape both credit performance and borrowing costs.

3.2 Sample Construction and Variable Definition

The dataset was obtained from the internal monitoring system of a guarantee program and includes loan-level variables such as loan amount, disbursement date, sector classification, interest rate, collateral status, coverage ratio, and default amounts. Records with missing or inconsistent values for any of these variables were excluded. After cleaning, the final analytical sample comprises 22,578 loans, representing about 80% of the original portfolio. Key variables used in the analysis are:

- **Default Rate:** Defined as the ratio of the defaulted amount to the approved amount. This variable is bounded in [0,1] and serves as the dependent variable in Model 1.
- **Interest Rate:** The nominal annual percentage rate (APR) charged on the loan, used as the dependent variable in Model 2.
- **Coverage Ratio:** The proportion of the loan amount that is guaranteed by AGF.
- **Collateral:** A binary variable equal to 1 if the loan is backed by any form of collateral, 0 otherwise.
- **Sector:** Industry classification of the borrower, entered as a set of sector dummy variables.

- **Loan size:** The total facility amount approved and disbursed to the MSME
- **- Loan type:** Loan types were systematically grouped into seven categories based on keyword patterns. Table 1 presents how different loan facilities were classified into analytically meaningful facility types for structured analysis.

Table 1: Construction of the Loan Type Variable

Loan type Code	Loan type (group)	Original loan facility types
1	Term Loan	Term Loan, Medium Term Loan, Long Term Loan, Convertible Loan, Refinancing
2	Working Capital	Working Capital, Overdraft, Business Working Capital
3	Asset Finance	Asset Finance, Leasing, LPO Financing, Import Duty Finance
4	Invoice/ Receivables	Invoice Discounting, Invoice Financing, Receivable Finance, Supply Chain Financing
5	Trade Finance	Trade Finance, Letter of Credit, Post Import Finance, Preshipment Finance, Line Of Credit
6	Guarantees & Bonds	Bank Guarantee, Bond Guarantee, Performance Guarantee
7	Other	All other unmatched facility types

3.3 Empirical Strategy

This study employs two complementary econometric models to analyze how loan, sectoral, and guarantee features affect default outcomes and borrowing costs in Kenya's PCG program. The empirical models are grounded in financial intermediation and risk-sharing theory. The study of the risk-default relationship employs a fractional logit model which draws inspiration from the delegated monitoring frameworks where guarantees reduce expected loss rates but do not eliminate borrower moral hazard. The interest rate equation reflects a reduced-form bank pricing rule, where lending rates depend on expected default losses, capital costs, and loan characteristics. The interaction between collateral and guarantees tests whether these instruments act as substitutes or complements in the bank's optimal pricing problem.

3.3.1 Model 1: Sectoral Risk and Loan Defaults

Tthe dependent variable in this model, the default rate D_i, is bounded in the unit interval [0,1], linear models such as Ordinary Least Squares (OLS) are inappropriate due to their failure to ensure predicted values remain within logical bounds. To address this, I employ the fractional logit model developed by Papke and Wooldridge (1996), which is tailored for modeling proportion-type outcomes, including values at the boundaries of the interval.

Let D_i denote the default rate for loan i, and let x_i be a vector of explanatory variables including sector dummies, loan type, loan size, interest rate, guarantee coverage ratio, and collateral status. The model assumes:

$$E(D_i \mid x_i) = G(x_i\beta) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

where the function $G(\cdot)$ takes the logistic form:

$$G(x_i\,\beta) = 1/(1+\exp(-x_i\,\beta)) \quad \ldots\ldots \quad (2)$$

This ensures that the predicted default probabilities lie strictly within the (0,1) interval. Estimation proceeds via quasi-maximum likelihood, based on the Bernoulli log-likelihood function:

$$l_i(\beta) = D_i\, log(G(x_i\,\beta)) + (1-D_i)log(1-G(x_i\,\beta)) \quad \ldots\ldots\ldots\ldots\ldots \quad (3)$$

Table 2: Variable Definitions and Expected Signs

Variable	Description	Type	Expected Sign	Justification
Default Rate	Defaulted amount / approved amount	Fraction	N/A	Dependent variable
Sector	Industry category (agriculture, trade, manufacturing, etc.)	Categorical	Varies	Higher defaults expected in informal, volatile sectors
Loan Type	Loan product category (term loan, working capital, etc.)	Categorical	Varies	Product types have differing risk profiles and tenors
Interest Rate	Annual interest rate charged on the loan (%)	Continuous	Positive	Higher repayment burden increases likelihood of default
Coverage Ratio	Percentage of loan covered by the guarantee (%)	Continuous	Ambiguous	High coverage may reduce borrower discipline, or de-risk the loan
Collateral	Dummy = 1 if loan is collateralized, 0 otherwise	Binary	Negative	Collateral reduces moral hazard and repayment risk
Loan size	Approved loan amount, entered in logarithmic form (log of amount in KES)	Continuous	Ambiguous	Larger loans may indicate better screening and monitoring (negative), or greater exposure (positive)

3.4.2 Model 2: Guarantee Impact on Borrowing Costs.

To test whether guarantees lower borrowing costs, I estimate an Ordinary Least Squares (OLS) regression:

$$"InterestRate"_i = \beta_0 + \beta_1 \cdot "DefaultRate"_i + \beta_2 \cdot "CoverageRatio"_i + \beta_3 \cdot "Collateral"_i + \beta_4 \cdot "Sector"_i + \beta_5 \cdot "LoanType"_i + \beta_6 \cdot "LoanSize"_i + \varepsilon_i \quad \ldots\ldots\ldots\ldots \quad (4)$$

All the explanatory variables are defined in model 1. Robust standard errors are used to account for heteroskedasticity. The linear model offers baseline insights into the average effects of guarantees and collateral on borrowing costs. **Table 3** summarizes the hypothesized signs of the coefficients in the interest rate regression model (equation 4). The expected signs reflect theoretical and empirical considerations related to credit risk, loan structure, and guarantee mechanisms. The actual direction and magnitude of these effects will be empirically tested using the loan-level dataset.

Table 3: Expected coefficient signs in the Interest Rate Regression Model

Variable	Expected Sign	Justification
Default Rate	Positive	Higher risk leads to higher interest rate pricing
Coverage Ratio	Ambiguous	May lower lender risk but could also reduce borrower discipline
Collateral	Negative	Collateral signals lower risk and improves recoverability
Sector	Varies	Interest rate pricing depends on sector-specific risk norms
Loan Type	Varies	Loan product features and maturity structure influence pricing
Loan Size	Negative	Larger loans may face lower rates due to economies of scale and bargaining power

To enhance the baseline model, I incorporate an interaction between the coverage ratio and collateral status. The rationale is straightforward: the effect of government guarantees on loan pricing might vary depending on whether the loan is already secured by collateral. A guarantee could either substitute for collateral—reducing the marginal benefit of additional coverage—or complement it by further lowering the lender's perceived risk for secured loans. The extended specification is given by:

$$"InterestRate"_i = \beta_0 + \beta_1 \cdot "DefaultRate"_i + \beta_2 \cdot "CoverageRatio"_i + \beta_3 \cdot "Collateral"_i + \beta_4 \cdot ("CoverageRatio"_i \times "Collateral"_i) + \beta_5 \cdot "Sector"_i + \beta_6 \cdot "LoanType"_i + \beta_7 \cdot "LoanSize"_i + \varepsilon_i \quad (5)$$

The key variable of interest in this extended specification is the interaction term between the guarantee coverage ratio and collateral status. The expected sign of the interaction coefficient, is theoretically ambiguous and depends on whether guarantees and collateral act as substitutes or complements in the lender's pricing strategy. If guarantees substitute for collateral—i.e., the presence of one reduces the marginal value of the other—then we would expect a positive sign on β_4, suggesting that the marginal impact of the guarantee is smaller for secured loans. Conversely, if guarantees and collateral complement each other by jointly reducing perceived risk and thus warranting a greater interest rate reduction, then β_4 is expected to be negative. Empirically identifying the direction and significance of this interaction is essential for understanding how lenders integrate multiple forms of credit risk mitigation into their pricing models.

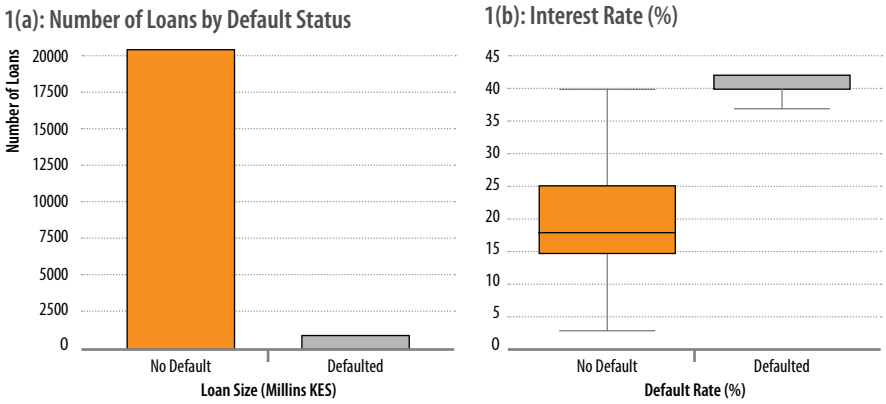
4.0 Empirical Results and Discussion

4.1 Descriptive Statistics and Stylized Facts

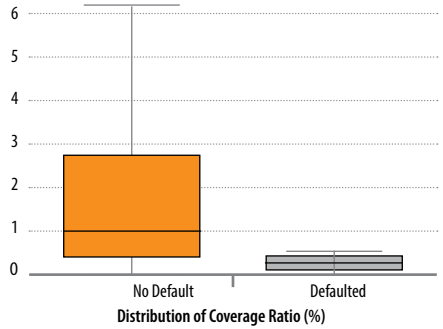
Figure 1 summarizes the key variables underlying default risk and loan pricing in Kenya's PCG program. Panel (a) highlights that defaults are rare—only about 5.5% of loans show any default, though severity varies widely, with losses reaching up to 46% of loan value.

Panels (b)–(d) reveal clear contrasts between defaulted and performing loans. Defaulted loans carry significantly higher interest rates (median 42% vs. 19%), smaller loan sizes (median KES 0.2m vs. 1.0m), and higher default ratios, suggesting that both ex-ante risk-based pricing and borrower constraints shape outcomes. Panel (e) shows that coverage ratios are tightly clustered around the 50% benchmark, reflecting standardized program design rather than market-driven variation. This implies that guarantees mainly function as a fixed policy lever rather than a flexible risk-pricing instrument.

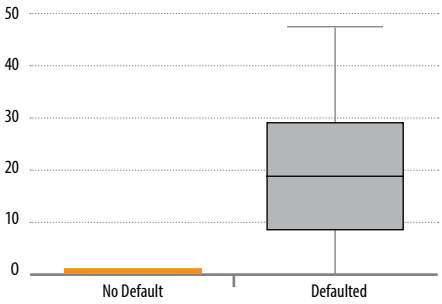
Figure 1: Descriptive Statistics for Key Variables



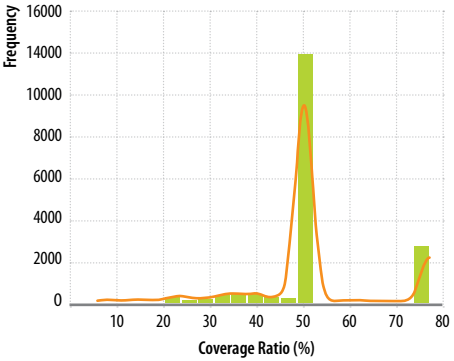
1(c): Loan Size (Million KES)



1(d): Default Rate (%)



1(e): Distribution of Coverage Ratio (%)



This figure summarizes the main variables used in the analysis of default risk and loan pricing under Kenya's Partial Credit Guarantee (PCG) program. Panel (a) shows the distribution of defaulted and non-defaulted loans. Panels (b) to (d) compare interest rates, loan sizes (in million KES), and default rates across these groups. Panel (e) displays the distribution of the coverage ratio, which is centered around the program's benchmark of 50%.

Having outlined the broad distributional features of the dataset, we now turn to a set of stylized facts that offer deeper insights into the empirical patterns underlying loan performance and pricing under the PCG framework.

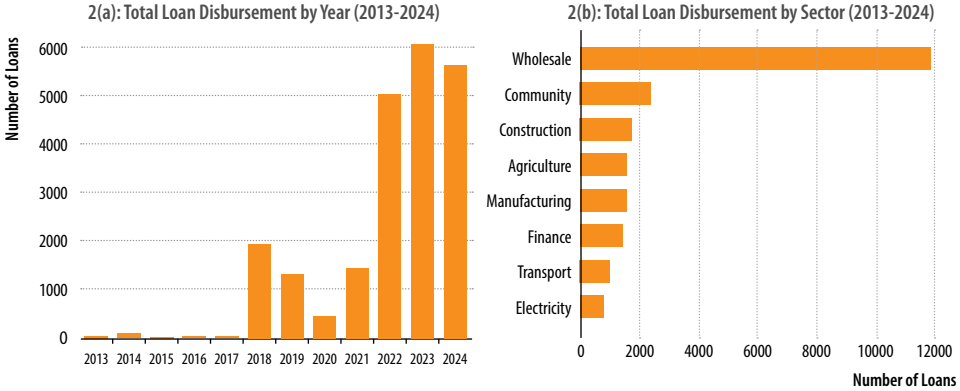
1. MSME financing remains shallow despite guarantee expansion.

Although MSMEs dominate Kenya's enterprise base, only about 17 percent access formal credit, according to FinAccess (2024). The majority still depend on informal lenders or SACCOs. Most guaranteed loans are relatively small—typically under KSh 1 million—indicating that guarantees mainly reach micro and lower-tier small firms rather than medium enterprises.

2. Guarantee uptake has accelerated but remains concentrated.

Guaranteed lending grew steadily between 2013 and 2024, with a sharp increase after 2018 driven by stronger public and development finance participation. As shown in Figure 2, lending remains concentrated in a few sectors, mainly wholesale and community services, while agriculture and manufacturing continue to lag. The pattern highlights persistent gaps in credit access and the need to extend guarantees to smaller institutions and underserved sectors.

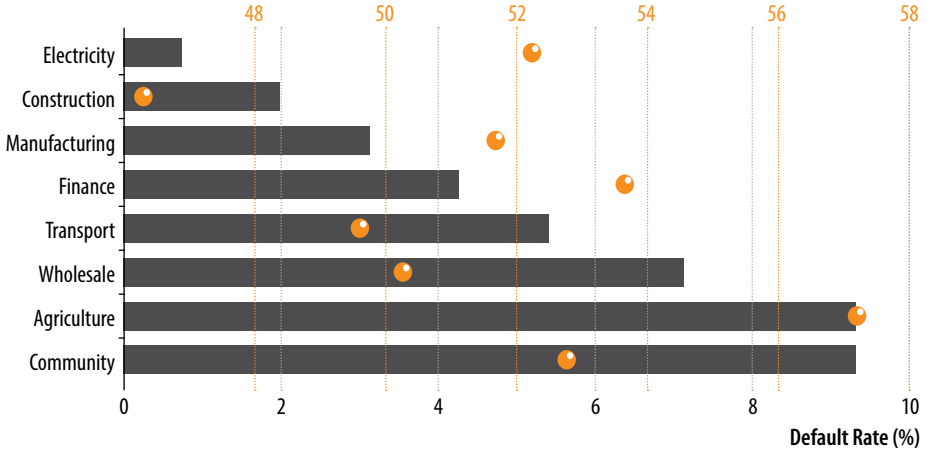
Figure 2: Trends in Guaranteed Lending and Sectoral Concentration under Kenya's Partial Credit Guarantee Program, 2013–2024



3. *Defaults are concentrated in risk-intensive sectors.*

Default rates vary sharply across industries. Agriculture and community services record the highest incidence—around 9 to 12 percent—compared with 5 percent in manufacturing and 4 percent in energy. Higher coverage ratios in high-risk sectors (averaging 52 percent versus 47 percent elsewhere) show that guarantees have been used to offset structural risk, though with exposure to volatility. This pattern highlights the need for risk-based pricing and stronger portfolio diversification to safeguard guarantee funds while maintaining access for riskier but economically important sectors. (See **Figure 3**).

Figure 3: Sectoral Patterns of Default and Guarantee Coverage

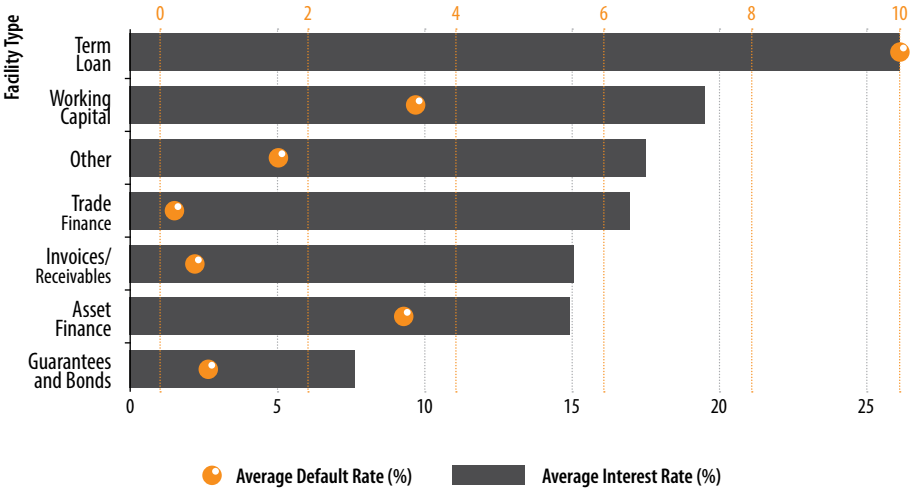


Note: Blue bars show the average default rate for guaranteed loans in each sector between 2013 and 2024. Orange markers indicate the average share of each loan covered by the guarantee (coverage ratio).

Borrowing costs remain high and uneven

Borrowing costs and default risks vary widely across facility types. Term loans attract the highest rates at 26.4 percent and the highest default rate of about 10 percent, while guarantees and bonds are priced lowest at 7.8 percent with minimal defaults. The strong link between risk and pricing indicates that banks adjust rates according to perceived credit risk, yet the wide dispersion suggests limited pass-through of guarantee benefits to borrowers. Overall, guarantees seem to reduce lender exposure more than they ease borrowing costs for higher-risk MSMEs. (See **Figure 4**.)

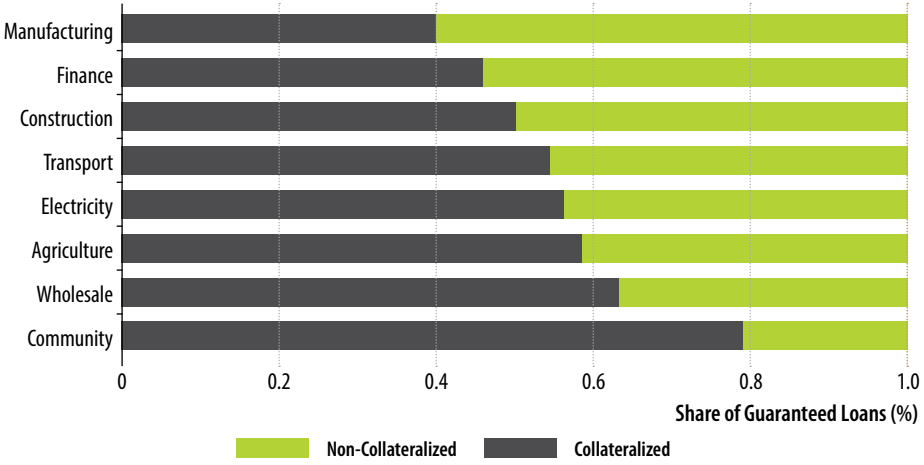
Figure 4: Borrowing Costs and Default Risks Across Facility Types



Collateralization Remains High Despite Guarantees

Across sectors, the majority of guaranteed loans remain collateralized, with shares exceeding two-thirds in manufacturing, construction, and trade. This pattern shows that guarantees are being used alongside—rather than in place of—traditional security instruments. The approach provides comfort to lenders and mitigates portfolio risk but limits the scheme's capacity to expand credit access for firms lacking tangible collateral. The persistence of collateral requirements, even under a guarantee framework, suggests that financial institutions continue to rely heavily on asset-based lending practices rather than risk-based credit assessment.

Figure 5: Collateralization of guaranteed loans by sector



4.2 Determinants of Loan Default Rates

Table 4 presents the average marginal effects (AME) from a fractional logit model estimating the impact of loan-specific, sectoral, and guarantee-related variables on loan default rates within a partial credit guarantee (PCG) framework. The use of fractional logit, following Papke and Wooldridge (1996), is appropriate given the bounded nature of the dependent variable (default rates $\in [0,1]$). The marginal effects quantify the percentage point change in the default rate associated with a one-unit change in each covariate, holding all else constant.

Sectoral Variation in Default Risk

Compared to the reference sector (Agriculture), default risk varies significantly across sectors, highlighting heterogeneity in sector-specific credit risk profiles. Loans to the Community sector exhibit a 0.5 percentage point increase in the default rate ($p < 0.01$), suggesting higher vulnerability in this sector, possibly due to informal enterprise structures and irregular cash flows (Beck et al., 2008).

In contrast, the Electricity sector shows a notable decrease of 0.8 percentage points in default risk ($p < 0.01$), consistent with the stable revenue models and regulated market conditions often characterizing utility firms. Similarly, Manufacturing loans are associated with a 0.3 percentage point lower default rate ($p < 0.01$), potentially reflecting collateralizable assets and established credit relationships.

The Construction sector exhibits a modest increase in default risk (-0.1 percentage points, $p < 0.10$), aligning with the cyclical nature and execution risks of construction projects. Finance sector loans show

a small but significant decrease in default risk (0.1 percentage points, $p < 0.01$), possibly reflecting better financial management or due diligence in loan access.

For Transport, the marginal effect is positive but statistically insignificant, indicating no robust effect on default risk, while Wholesale is associated with a 0.1 percentage point decrease in defaults ($p < 0.01$), perhaps due to rapid inventory turnover and shorter credit cycles.

These results reinforce findings from Jiménez and Saurina (2004), who documented industry-driven credit risk, and suggest that PCG program design should consider sector-specific risk pricing or risk-sharing mechanisms.

Loan Terms and Guarantee Features

The interest rate exhibits a positive and statistically significant marginal effect (0.1 percentage points per unit increase, $p < 0.01$), confirming the pricing-risk nexus. Higher rates may either signal borrower risk (adverse selection) or induce repayment stress, elevating default probability (Stiglitz and Weiss, 1981; Degryse and Van Cayseele, 2000). This underscores the trade-off between risk-based pricing and credit risk containment.

The coverage ratio, measuring the guarantee's intensity, shows a small but significant negative marginal effect (-0.02 percentage points per unit increase, $p < 0.05$). This suggests that higher guarantee coverage marginally reduces default rates, consistent with theories positing that credit guarantees relax borrowing constraints and promote financial discipline (Holmström and Tirole, 1997; Honohan, 2010). While the estimated marginal reduction in default rates associated with higher guarantee coverage appears numerically small (around 0.2 percentage points), its economic significance is substantial when scaled to portfolio size. Applied to the full guaranteed portfolio, this reduction translates into millions of shillings in avoided losses annually. Moreover, in high-risk sectors such as agriculture, even modest default reductions materially improve portfolio sustainability and reduce fiscal exposure for guarantee providers.

Collateral has a large negative marginal effect (-1.5 percentage points, $p < 0.01$), indicating a strong inverse relationship between collateral presence and default risk. This supports empirical evidence that collateral mitigates moral hazard and enhances loan recovery incentives (Berger and Udell, 1990; Cowan et al., 2015). The effect of loan size on default is statistically insignificant, indicating that within this sample, larger loans do not exhibit systematically different default risks, perhaps due to risk-adjusted loan allocation or credit rationing.

Table 4: Average Marginal Effects from Fractional Logit

Variable	Marginal Effect	Standard Error
Agriculture (Base)	0.000	(.)
Community	0.005***	(0.000)
Construction	-0.001*	(0.001)
Electricity	-0.008***	(0.000)
Finance	0.001***	(0.000)
Manufacturing	-0.003***	(0.000)

Variable	Marginal Effect	Standard Error
Transport	0.001	(0.000)
Wholesale	-0.001***	(0.000)
Interest Rate	0.001***	(0.000)
Coverage Ratio	-0.000**	(0.000)
Collateral	-0.015***	(0.002)
Loan Size	0.000	(0.001)
Observations	21,836	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.3 Impact of Guarantees on Borrowing Costs

Table 5 presents OLS estimates of the determinants of interest rates charged to MSMEs within a partial credit guarantee (PCG) framework. The dependent variable is the nominal interest rate, and the regressors include loan-specific credit risk measures, guarantee coverage, collateral status, sector classification, loan type, and loan size. Model (1) presents baseline results without interaction terms, while Model (2) includes an interaction between coverage ratio and collateral to explore whether the pricing impact of guarantees varies by collateral status.

In both models, the default rate is positively and significantly associated with interest rates. A one-unit increase in the default rate leads to an approximate 30 percentage point increase in the interest rate ($p < 0.01$), confirming that banks adjust lending rates in response to borrower-specific risk. This is consistent with theories of risk-based pricing under asymmetric information (Stiglitz and Weiss, 1981) and with empirical evidence from SME lending markets in developing economies (Dehejia et al., 2012).

Guarantee coverage and collateral both reduce interest rates, but their effects differ in magnitude depending on the model specification. In Model (2), a one-percentage-point increase in the coverage ratio reduces the interest rate by 0.178 points, while the presence of collateral reduces rates by over 15 percentage points (both significant at $p < 0.01$). The interaction term between coverage and collateral is positive and significant (0.227, $p < 0.01$), suggesting that guarantees and collateral act as substitutes in the bank's pricing strategy. In other words, the marginal benefit of guarantee coverage diminishes when a loan is already secured. Similar substitution effects have been observed in credit markets where multiple risk mitigants are used simultaneously (Cowan et al., 2015).

Sectoral differences are economically and statistically significant. Using agriculture as the base category, most sectors—such as community services, construction, electricity, and finance—are charged significantly lower interest rates. For example, loans in the community sector are priced 3.1 percentage points lower than those in agriculture ($p < 0.01$). This pattern indicates that banks apply a risk premium to agricultural loans, likely due to concerns over seasonality, income volatility, and enforcement challenges. Despite the presence of guarantee coverage and collateral, the agriculture sector remains relatively more expensive to finance, which is consistent with findings by Beck et al. (2011) that rural and agricultural lending remains costly even with institutional support.

Loan type also plays a critical role in pricing. Facilities such as invoice discounting, asset finance, and guarantees and bonds are associated with significantly lower interest rates compared to standard term loans. These products often involve shorter maturities and better collateral, which may explain their more favorable pricing. Larger loans are priced more favorably, with a negative and significant coefficient on loan size, reflecting economies of scale or greater bargaining power on the part of larger borrowers (Berger and Udell, 1996).

The inclusion of the interaction term improves model fit, with the adjusted R-squared increasing from 0.387 to 0.403 between Models (1) and (2). This suggests that accounting for how collateral and guarantee coverage jointly affect pricing provides a more accurate explanation of lending behavior in the PCG-supported portfolio.

Table 5: OLS Regression Results for Borrowing Costs

	(1) Without Interaction	(2) With Interaction
Default rate	30.917***	29.887***
	(1.238)	(1.223)
Coverage ratio	-0.044***	-0.178***
	(0.004)	(0.008)
Collateral	-3.665***	-15.568***
	(0.118)	(0.493)
Sector: base Agriculture	0.000	0.000
Community	-3.257***	-3.121***
	(0.272)	(0.267)
Construction	-2.719***	-2.478***
	(0.259)	(0.258)
Electricity	-3.027***	-2.729***
	(0.340)	(0.334)
Finance	-1.714***	-1.731***
	(0.299)	(0.291)
Manufacturing	0.976***	0.968***
	(0.269)	(0.263)

	(1) Without Interaction	(2) With Interaction
Transport	-1.350***	-1.175***
	(0.334)	(0.329)
Wholesale	0.125	0.341
	(0.219)	(0.214)
Loan Type: Base Term loan	0.000	0.000
Working capital	-4.755***	-5.046***
	(0.168)	(0.164)
Asset finance	-8.163***	-7.744***
	(0.279)	(0.274)
Invoice/receivables	-8.953***	-8.637***
	(0.156)	(0.157)
Trade finance	-4.450***	-3.578***
	(0.297)	(0.294)
Guarantees & bonds	-14.685***	-14.294***
	(0.648)	(0.634)
Other	-3.470***	-3.241***
	(0.145)	(0.144)
Loan size	-2.247***	-2.194***
	(0.043)	(0.042)
Interaction		0.227***
		(0.009)
Constant	28.496***	35.490***
	(0.342)	(0.500)
Observations	21836.000	21836.000
Adj. R-squared	0.387	0.403

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.4 Robustness Checks

To ensure robustness, several diagnostic checks were conducted. First, multicollinearity was assessed using variance inflation factors (VIFs), with all values below conventional thresholds. Second, potential endogeneity between interest rates and default risk was examined using lagged pricing and sector-level risk proxies; results remained stable. Third, alternative specifications excluding extreme default observations and re-estimating models by sub-period (pre- and post-2018) yielded qualitatively similar findings. These checks confirm that the main results are not driven by specification bias or outliers.

4.5 Comparative Analysis: Kenya and International Best practices

4.5.1 Kenya's Partial Credit Guarantee Landscape

Public scheme: National Treasury MSME-CGS.

Launched in December 2020 as a pilot risk-sharing facility, the MSME Credit Guarantee Scheme (MSME-CGS) was implemented through seven partner banks to ease MSME credit constraints. By December 2023, the scheme had facilitated lending to 4,078 MSMEs amounting to KSh 6.18 billion. Roughly 71 percent of beneficiaries were new-to-bank, while around 20 percent were women, youth, or persons with disabilities. Lending, however, remains concentrated in trade-related sectors. Institutionally, the scheme operates as a Treasury unit, with draft policy proposals recommending conversion into an independent legal entity under stronger governance and with a clearer supervisory role for the Central Bank of Kenya (CBK).

International and private guarantee providers

Kenya also hosts a pluralistic guarantee market. The African Guarantee Fund (AGF), headquartered in Nairobi, provides portfolio guarantees to commercial banks (Absa, Stanbic, SBM, NBK), with specialized windows for women (AFAWA) and green finance. In 2023, AGF signed USD 500 million in new guarantees across Africa—the largest in its history—bringing cumulative SME financing enabled to nearly USD 4 billion. Proparco–AFD's ARIZ program operates portfolio guarantees with banks such as Equity, complementing debt lines and providing additional risk-sharing. The U.S. Development Finance Corporation (DFC) and USAID have, since 2012, backed multi-party guarantees in Kenya, particularly in agri-MSME lending, with independent evaluations confirming measurable additionality.

Kenya's guarantee market is thus characterized by a nascent public scheme complemented by specialized international providers, creating opportunities for scale, co-financing, and knowledge transfer.

4.5.2 What Works Internationally and Lessons to Learn

Governance and institutional setup.

World Bank principles emphasize that public CGSs perform best when structured as independent entities with transparent funding, professionalized management, and clear supervisory interfaces. Korea's KODIT exemplifies this model, with solvency safeguards and differentiated coverage ratios (70–85 percent) for strategic borrowers. Morocco's

TAMWILCOM similarly operates as a dedicated public financial institution with higher coverage for women and micro firms.

Implication for Kenya: converting the CGS into an independent entity with a codified CBK interface would enhance credibility, lender confidence, and prudential recognition.

Product design: coverage and pricing.

Global best practice links guarantee coverage to borrower segment and risk profile. KODIT and the SBA 7(a) program vary ratios by loan size and borrower type, while AGF and SBA also apply risk-based fee structures. Evidence from Chile's FOGAPE shows that high coverage combined with structured allocation can achieve significant outreach.

Implication for Kenya: transitioning from a uniform 50 percent ratio toward a menu (e.g., 50–60 percent base; 70–80 percent for priority windows such as women, start-ups, or agri value chains) with transparent, risk-based fees and contractual pass-through to borrowers.

Allocation mechanisms.

Chile's FOGAPE pioneered an auction-based allocation system in which banks compete for guarantee rights by bidding the lowest coverage ratio they are willing to accept. In practice, this mechanism minimizes rent-seeking by preventing banks from automatically accessing high-coverage guarantees, and instead rewards those willing to extend credit under leaner public support. The competitive structure not only ensures fiscal efficiency (lower expected losses for the government) but also incentivizes banks to channel credit toward riskier SMEs to win allocations. Evaluations show that this model expanded outreach to new borrowers and diversified sectoral coverage, while maintaining sustainability by tying public risk-taking to demonstrated lender performance.

Implication for Kenya: piloting auction or performance-linked allocation could redirect guarantees toward underserved sectors (agriculture, manufacturing) while incentivizing efficiency among participating banks.

5.0 Conclusions and Policy Recommendations

This study provides new empirical evidence on the effectiveness of partial credit guarantees (PCGs) in Kenya, drawing on loan-level data from over 28,000 MSME loans disbursed between 2013 and 2024. The analysis examined how sectoral risk and loan characteristics influence default outcomes and whether guarantees reduce borrowing costs in practice, while also benchmarking Kenya's experience against international best practices.

Three findings stand out. First, default outcomes reveal marked sectoral heterogeneity. Community services and agriculture exhibit significantly higher default risk, while manufacturing and electricity demonstrate lower default probabilities. Both collateral and guarantee coverage reduce default incidence, though collateral exerts the stronger marginal effect. Guarantees remain particularly important in high-risk sectors where they relax borrowing constraints and facilitate access that would otherwise be rationed. These results underscore the importance of risk-based guarantee design, particularly in calibrating coverage ratios to sectoral vulnerabilities.

Second, borrowing costs are shaped more by structural loan attributes—loan size, collateral, and guarantee coverage—than by borrower-specific risk. Larger and collateralized loans consistently attract lower interest rates, and higher guarantee coverage also contributes to reduced borrowing costs. However, the interaction between guarantees and collateral is positive and significant, suggesting a substitution effect: the marginal benefit of guarantees declines when loans are already secured. This indicates that banks continue to anchor risk-based pricing on collateral, limiting the pass-through of guarantee benefits to unsecured borrowers who most need them.

Third, the comparative analysis highlights Kenya's design and implementation gaps relative to international best practice. While successful schemes such as Korea's KODIT, Chile's FOGAPE, and the U.S. SBA employ higher and differentiated coverage ratios, risk-based pricing frameworks, independent oversight, and

competitive allocation mechanisms, Kenya's scheme remains conservative, standardized, and heavily bank-driven.

Policy recommendations follow directly. First, Kenya's Credit Guarantee Scheme should differentiate coverage ratios across sectors and loan types, offering higher protection to riskier but high-impact segments such as agriculture, community services, and start-ups. Second, mechanisms to improve the pass-through of guarantee benefits—including pricing benchmarks or conditional incentives for lenders—are needed to ensure guarantees lower borrowing costs in practice. Third, banks should be supported to strengthen borrower risk assessment tools to reduce over-reliance on collateral and align pricing more closely with credit risk and guarantee support.

Fourth, institutional reforms are essential: embedding risk-based pricing, strengthening oversight (ideally with the Central Bank of Kenya), piloting competitive allocation mechanisms, and ensuring timely claim settlements would bring Kenya's scheme closer to global standards.

In conclusion, while Kenya's PCGs have expanded MSME finance and lowered credit risk, their developmental potential remains underutilized. By aligning design and governance with international best practices, Kenya can transform its guarantee system into a more powerful instrument for financial inclusion, SME growth, and the achievement of Vision 2030's goals of inclusive and sustainable economic transformation.

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