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and Samantha Njoroge

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Credit Guarantee Schemes and MSME Financing in Kenya: A Firm – Level Analysis

Anthony Muli, David Ndwiga, Raphael Agung and
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Abstract

The study seeks to examine the effects of credit guarantee schemes on Micro, Small and Medium-sized Enterprises (MSME) lending. Specifically, the paper examined the performance of a specified credit guarantee scheme, effect of the credit guarantee scheme on MSME loan default probability and how loan repayment performs across different sectors. The study utilised bank level data for 2,398 MSMEs under the specified credit guarantee scheme. The study found that the credit guarantee scheme improves MSMEs access to formal credit. Furthermore, low default rate was reported based on firm count. Regarding credit guarantee coverage ratio – default probability nexus, this study established existence of moral hazard effect which is statistically significant. However, across different sectors, short run models find credit guarantee moral hazard sectoral bias, largely elevated in agriculture, building and construction, trade and manufacturing sectors. Additionally, default risk was found to reduce with firm age.

1.0 Introduction

The role of Micro, Small and Medium-sized Enterprises (MSMEs) in supporting economic growth remains undisputed given their large share of employment creation and Gross Domestic Product (GDP) contribution especially for developing economies. In Kenya, it is estimated that MSMEs employ over 15 million people and contribute about 30% to the national GDP (KIPPRA, 2019).

However, despite their pivotal role in the economy, MSME's access to formal credit has been hindered largely by lack of or inadequate collateral. Consistent with many empirical findings, MSMEs experience stronger financial impediments than large firms (Beck et al., 2005, Beck et al., 2007). Against this backdrop, and in realization of this crucial role of MSMEs in economic growth, the government has attempted several interventions. This includes credit guarantee schemes. Generally, credit guarantee schemes have been used as mechanisms of de-risking MSMEs thus enhancing their credit access.

In examining the role of credit guarantee schemes on SMEs credit access, Beck *et al.* (2010) underscores the scheme's role in risk transfer and diversification. The schemes enable MSMEs to obtain credit and improve terms and conditions under which they can borrow (Caselli, *et al.*, 2021). Additionally, upon facing economic shocks, credit guarantee schemes have been largely used to support MSMEs. In practice, most are mainly government backed schemes. A classic example is in Korea where credit guarantees have been used during crises to alleviate the adverse effects on MSMEs (IFC, 2010). Similarly, the European Union used partial credit guarantees to increase the loan coverage ratio to 90% for distressed MSMEs.

Globally, evidence supporting credit guarantee schemes as credit access enhancing mechanisms have been reported by Saadani and Rocha R. (2011) and IFC (2010) among others. However, the salient question on how the schemes have achieved the intended credit access goal among MSMEs remains a grey area. Moreover, the issue of moral hazard among MSMEs stands. To this effect several strands of literature exists as to whether credit guarantee schemes have contributed to more MSME lending and if so, what is the quality of this lending? This literature remains inconclusive on this subject. This calls for further analysis of the effectiveness of credit guarantee schemes in MSME financing especially among the developing economies.

The study adopts the definition of MSMEs provided under the Micro and Small Enterprises Act (MSEA Act) 2012, and the Public Finance Management (Amendment) Act, (No. 2) of 2020. To this end, an MSME is defined by annual turnover, number of employees and assets as shown in the table below.

Table 1.1: Definition of MSME in Kenya

Category	Sector	Annual Turnover (Kes)	No. of Employees	Assets (KES)
Micro	All	$\leq 500,000$	< 10	N/A
Small	All	$500,000 < X \leq 5,000,000$	$10 < X \leq 49$	N/A
Medium	Manufacturing	$5,000,000 < X \leq 100,000,000$	$50 \geq X \leq 250$	125 -250 million
	Service	$5,000,000 < X \leq 100,000,000$	$50 \geq X \leq 250$	250 million

Source: Micro and Small Enterprises Act (2012)

The study adopts the World Bank (2025) definition of a credit guarantee schemes as an arrangement where there is provision of a third-party credit risk mitigation to lenders through absorption of a portion of the lender’s losses on the loans to MSMEs in case there is a default.

1.1 Credit guarantee schemes and MSMEs financing in Kenya

Kenya’s government backed credit guarantee scheme is anchored on the Public Finance Management Act, 2012 and the Public Finance (Credit Guarantee Scheme) Regulations, 2020. Since its establishment, the government allocated financial resources to MSMEs – with KES 3 billion seed capital in FY 2020/21. Currently, the scheme is implemented through a risk sharing agreement between the Government and 7 banks namely: ABSA, the Co-operative bank of Kenya, Credit, DTB, KCB, NCBA and Stanbic bank. Under the scheme, the loan amount is capped at KES 5 million,

with a 3-year tenure and 5 months of grace period. The scheme guarantees 50% of outstanding principal subject to a maximum of 25% of the principal amount in the event of default.

As of March 2025, according to the annual performance report (National Treasury, 2025), the government backed credit guarantee schemes had disbursed KES 6.52 billion to 4,259 MSMEs. Out of the total beneficiaries, micro enterprises were 28.3%, small enterprises 57.3%, and medium enterprises 14.4%. The fiscal year 2023/2024 audit indicates that as of June 2024, total active facilities stood at 1,592 of which 1,153 were normal and 439 delinquents. By June 2024, 50% of the 4,121 MSMEs reported increased credit worthiness having zero collateralization, an indication of increased credit access for SMEs who have no collateral. However, despite this performance, the scheme reports challenges of model unsustainability, moral hazard and MSMEs informality.

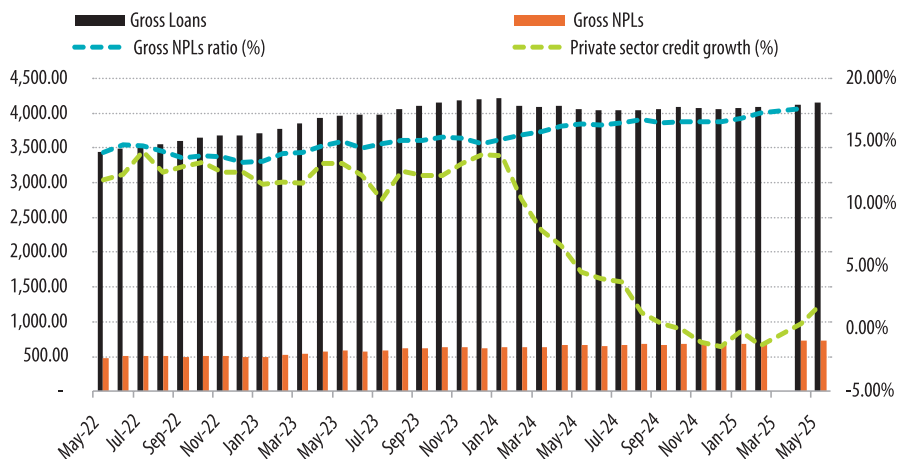
In addition to the state backed credit guarantee scheme, commercial banks in Kenya have been in partnership with various guarantee schemes mainly focusing on MSMEs. These include Africa Guarantee Fund, Kilimo Biashara Credit Guarantee Scheme by Alliance for a Green Revolution in Africa and the Government of Kenya. Moreover, we have USAID credit guarantee scheme, ARIZ credit guarantee scheme funded by AfD. Finally, we have DFI funded schemes such as European Investment Bank, Proparco, FMO, DEG, The Swedish International Development Cooperation Agency, African Development Bank, KfW (KfW) and Norfund mainly targeting MSMEs.

Despite the existence of a government backed credit guarantee schemes in Kenya, MSMEs continue to face financial constraints. A survey by Kenya Bankers Association, indicates difficulty in accessing credit, whether from formal or informal sources. In this

survey, 50.7% of enterprises reported difficulty in accessing bank loans and 44.6% reported ease in accessing a loan from informal moneylenders. This outcome points to the need to examine credit guarantee scheme performance beyond just the disbursed amounts to facility utilization, scheme's effect on MSMEs credit score, quality of portfolio and effects of coverage ratio on portfolio quality.

On the credit market, Kenya's banking industry is facing deteriorating credit quality, which has contributed to low-risk appetite by lenders. Private sector credit growth has been low at 2.0% as at April 2025 from 0.4% in April 2024. This challenge is likely to affect MSMEs more, hence further financial constraints. This thus elevates the call for credit guarantee schemes in enhancing MSMEs access to credit through reduced bank exposure.

Figure 1: Kenya banking industry gross loans, non – performing loans and private sector credit growth



1.2 Problem statement

Credit guarantee schemes have been widely used to unlock credit access mainly among MSMEs which have been credit constrained due to inadequate credit collateral. To address this challenge, several countries have rolled out credit guarantee schemes. So far, much of the intervention has been reported in Asia. According to available literature, analysis of their performance posits conflicting findings. Notably, Cowan *et al* (2025) found that firms that have both guaranteed and non-guaranteed loans are 1.67% more likely to miss payments on their guaranteed loans but are not likely to default on these loans. Furthermore, firms selected into the guarantee programs are 1.17% more likely to default on their loans compared with similar firms that borrow without guarantees.

While credit guarantee schemes have been largely advocated for, there exists a strand of empirical work that has seen the scheme as reducing market discipline, facilitating access to credit to low-quality firms and creating moral hazard and adverse selection problems (Kuniyoshi and Tsuruta, 2014, Gropp et al., 2013). Moreover, running credit guarantee programs could be costly. In the United Kingdom, Cowling (2010) found that the scheme increased credit availability but the effect on economic incentives is unclear. In Japan Uesugi *et al* (2010) reports that credit guarantee increases the availability of credit in the short term, with most of MSMEs experiencing a deterioration in long-term performance on the loans. In Malaysia, Boocock and Shariff (2005) find no conclusive evidence about the effectiveness of the scheme with delinquencies reported.

In Kenya, the government backed credit guarantee scheme remains inadequate in meeting MSMEs financial needs given its low budgetary allocations. Consequently, commercial banks have augmented government efforts through partnerships with other financial institutions.

In summary, following this inconclusiveness of the performance of credit guarantee schemes, this study seeks to assess their performance by analysing a specific guarantee scheme utilization in Kenya, quality of portfolio and coverage ratio – default probability nexus. The coverage ratio-default probability helps to substantiate the moral hazard effect of credit guarantee scheme among MSMEs.

1.3 Research objectives

This study seeks to examine the success of credit guarantee schemes in enhancing access to credit by MSMEs in Kenya.

Specifically, the study seeks:

- To examine the performance of credit guarantee scheme among MSMEs in Kenya.
- To determine effect of credit guarantee scheme coverage ratio on probability of default among MSMEs in Kenya.
- To examine probability of default across various sectors.

1.4 Significance of the study

The significance of this study is three-fold. Firstly, over the years, policy makers including government have called for the implementation of credit guarantee schemes as a key MSMEs derisking mechanisms. This is informed by the fact that MSMEs are considered risky thus difficult in attracting reasonable lending from formal financial institutions. Underpinning this argument, the government is running a government-backed credit guarantee scheme under the National Treasury. The study findings therefore are crucial in testing the hypothesis as to whether credit guarantee schemes are successful in de-risking MSMEs thus unlocking their access to formal financing. Furthermore, the study findings are crucial in informing policies around credit guarantee schemes enhancement as well as redesigning.

Secondly, the findings are important in informing financial institutions mainly commercial banks

whether credit guarantee schemes promote moral hazards among MSMEs, hence, deterioration in bank assets quality. The finding is important in informing banks' credit standards for credit guarantee schemes backed lending thus managing bank exposure. Moreover, the findings are important to development financial institutions in deciding on whether to scale up or down credit guarantee scheme funding. Additionally, the research findings on the sectoral moral hazard bias would inform commercial banks and development financial institutions on the need for differentiated risk scores across sectors.

Thirdly, the study is of great contributions to literature. Inadequate access to granular and bank level data is evident, with limited empirical studies. The study adds to the body of literature in this subject by provoking a discussion on the effectiveness of credit guarantee schemes in Kenya.

2.0 Literature Review

2.1 Theoretical literature review

The study is based on information asymmetrical theory by Stiglitz and Weiss (1981), that underpins the credit constraints to the MSMEs by the lenders. In the presence of information asymmetry in the credit market, adverse selection and moral hazard tend to dominate credit markets leading to costly credit.

MSMEs are generally faced with higher information asymmetry than larger firms due to inadequate collateral and inherent uncertainties in cashflows. Therefore, this results in high risk profile attached to MSMEs by the lenders amid the lenders' inability to price MSMEs' risks with certainty. Consequently, MSMEs tend to be credit rationed with those successful in securing credit facility faced with high cost of credit compared to larger firms.

Therefore, as argued by (Stiglitz and Weiss 1981; Mankiw 1986; Gale 1991) in the context of credit markets information theory, credit markets for MSMEs will not necessarily be in equilibrium without government intervention. One common intervention is the credit guarantee schemes to derisk MSMEs thus enhancing their access to credit. Credit guarantee schemes therefore act as collateral with the coverage ratio indicating the collateral value. Given that credit guarantee schemes do not necessarily cover 100 percent of lending, MSMEs are required to provide a collateral equivalent to total lending net of the guaranteed value. Therefore, the credit guarantee scheme is crucial in reducing the value of collateral requirement, thus enhancing MSMEs access to credit.

Existence of credit guarantee does not necessarily solve the suboptimal credit allocation among the MSMEs. Consequently, this leaves room for adverse selection compounded by the moral hazard problem. Therefore, credit guarantee fails to entirely address MSME risks implying possibility of banks onboarding risky MSMEs despite having the scheme. Furthermore, presence of a credit guarantee scheme may promote moral hazard where the MSMEs may default on loan repayment riding adversely on the scheme.

Against this backdrop of information asymmetry in the credit market, in line with the information asymmetry theory by Stiglitz and Weiss (1981), we examine the effectiveness of a specified credit guarantee scheme in Kenya. Besides this, the paper examined the effect of credit guarantee scheme on MSME probability of default and how this changes across sectors. The study is cognizant that credit guarantee schemes may encourage moral hazard among the MSMEs leading to default.

2.2 Empirical literature Review

Globally, vast empirical literature exists on credit guarantee schemes and their effectiveness in addressing MSMEs access to formal financing. Early literature covers Asia where the schemes have been more pronounced. Within Europe, Brault and Signore (2019), examine the real effect of credit guarantee schemes for SMEs. They studied 360,867 firm – level guaranteed loans under the European Union Multi-Annual Programme for Enterprise, Entrepreneurship, Competitiveness and Innovation Framework programmes from 2002 to 2016 accounting for approximately 60% of all loan amounts guaranteed under these programmes. The study results evident that credit guaranteed schemes positively affect the growth of firm assets to more than 35% of total intangible and lower their probability to default to 5%.

A study to determine the effects of public credit guarantee schemes on firm – level performance in Türkiye concluded that public credit guarantee scheme supported firms by increasing their employment by 17 percent and sales by 70 percent while these firms reduced their credit default probability by 0.6

percentage points. However, the scheme is reported to increase firm's indebtedness, which may adversely affect firms' long-term financial health (Akcigit, *et al*, 2022).

In Albania, Besiana *et al*. (2021) examines effect of credit guarantees on sustainable SMEs financing. Study finding evidence that credit guarantee is positively related to SME's net income, total assets and working capital. Conversely, accounts receivable and interest expenses have a negative relationship with the net income.

Ufuk *et al*. (2021) examines the short-term impact of firms in Turkey. The study assessed relationship between credit guarantee funds and SMEs employment, credit default probability and sales. Results showed that broadly, the program had a positive effect on performance of the selected firms. However, the program was heterogeneous across firm size and sectors.

Among selected OECD countries, Paolo *et al*. (2019) investigated the impact of credit guarantee funds on SMEs bankruptcies. The study focused on the moral hazard and adverse selection associated with the credit guarantee schemes among SMEs in Columbia, Italy, Greece, France, Spain, Japan, USA, Republic of Korea and Turkey. Here, study findings were mixed, implying that the effects of credit guarantee schemes on SMEs bankruptcies differed across the countries.

In Italy, analysis on the effectiveness and impacts of credit guarantee funds on manufacturing companies covered the period 2012 to 2018. It showed that the probability of defaulting from a mutual

guarantee institution and counter-guaranteed by credit guarantee funds was lower compared to the probability of defaulted loans given by a bank and directly guaranteed by credit guarantee funds on SMEs under guarantor (Cristina et al. 2019).

2.3 Summary of empirical literature

Scanty empirical evidence is observed in the African context due to micro data availability, few guarantee schemes and failure in some initiated schemes. The sampled empirical studies appear to conclude that credit guarantees promote credit access by the scheme's targeted group. However, some do support existence

of moral hazard associated with credit guarantee schemes raising questions on the net benefits of the credit guarantee scheme (Paolo *et al.* 2019; Ufuk et al, 2021). However, on the contrary, Brault and Signore (2019) asserts that credit guarantees lower probability of loan default significantly. Therefore, studies so far are inconclusive on the moral hazard effect of credit guarantee schemes. In addition, the studies seem to adopt a general view of the credit guarantee schemes thus, being mute on firm level characteristics such as firm size, age, sector of operation and loan use even though they are likely to significantly affect credit guarantee scheme effectiveness. This study addresses these gaps.

3.0 Methodology and data

3.1 Theoretical framework

The theoretical framework is based on the utility maximization problem. In this case, an MSME seeks to maximize utility from an existing guarantee scheme by applying for guarantee backed facility. This implies that the MSME seeks to maximize borrowing under the credit guarantee scheme given the collateral challenges facing MSMEs.

However, this maximization is not without constraint. In maximizing borrowing benefits from guarantee – backed scheme, the MSME is faced with a major constraint of credit guarantee coverage ratio. Therefore, MSMEs borrow under a guarantee – backed scheme up to the level of guarantee coverage ratio. Based on this we could model MSME loans under guarantee – backed scheme as a function of credit guarantee cover and control for other factors such as firm age, sector of operation, use of borrowed funds among others.

However, in the consumption of loan, the risk of default is imminent. Based on the information asymmetry in credit market by Stiglitz and Weiss (1981) between borrowers and lenders, we can hypothesize that an MSME is likely to default on the loan repayment arising from moral hazard for having the guarantee in place. Then, for the lender, adverse selection of MSMEs could occur through the scheme's attracting risky MSMEs who seek to take advantage of it. Given this, we then model MSMEs moral hazard through probability of default. In this case as the MSMEs seeks to maximize utility under guarantee – backed scheme subject to guarantee coverage ratio, the risk of default arising from moral hazard is a function of the guarantee coverage, loan amounts and other firm level characteristics such as age, sector of operation, use of the facility among others. Based on this theoretical framework, we develop the empirical model.

3.2 Empirical model

To determine the performance of the credit guarantee scheme, two metrics are used. Firstly, the utilization level wherein we examine the level of repeat MSMEs for the scheme. Then, to examine the scheme performance, the study examines MSMEs who sought for facility enhancement either on coverage ratio or on

loan amounts. Lastly, a count of the firms that have defaulted on their repayment is done to examine the scheme's credit quality.

To examine effect of credit guarantee scheme on MSME loan default probability, the study employs a probit model to analyze probability of default for firms given the guarantee coverage ratio, amount of credit and firm level characteristics. Probit model is preferred to the logit model because the study seeks to model

latent behaviour in loan default. Ideally, loan default is unobserved. Further, the latent behaviour for default is amplified by the moral hazard arising from existence of the credit guarantee. In this case, probit model is preferred given its ability to model latent behaviour better than other binary models. Secondly, the probit model assumes the error term is normally distributed. This justifies the choice of probit model in the study. The general representation of the probity model is defined as follows:

$$Pr((Y=1)/X)=\Phi(X'\beta).....(1)$$

Where Pr denotes the probability of MSMEs under the specific guarantee fund defaulting on its loan repayment. X is a vector of the regressors which are assumed to influence the outcome Y and Φ is the Cumulative Distribution Function of the model and β is a vector of parameter estimates. X comprises of guaranteed coverage ratio, amount of credit and firm level characteristics (firm age, sector of operation and purpose of loan).

$$y_i^* = \alpha + \beta X_i + \varepsilon_i.....(2)$$

Where y^* is unobserved/ latent variable. X' is vector of independent variables such as social and demographic factors and α is the constant coefficient. Independent variables comprise of guaranteed coverage ratio, amount of credit and firm level characteristics (firm age, sector of operation and purpose of loan). Under this analysis, the study examines whether a higher scheme coverage ratio translates to improved credit quality at firm level.

The probit model assumes y^* to be a normally distributed random variable. From equation 2 above, we link unobservable variable y^* to the observed binary variable as expressed as follow:

$$y = \begin{cases} y=1, & \text{if } y^* > 0 \\ y=0, & \text{if } y^* \leq 0 \end{cases}.....(3)$$

3.3 Definition and measurement of variables

In this study, the model variables were defined and measured as follows:

Variable	Definition	Measurement
Default	Event of MSME failing to meet loan repayment as stipulated on loan contract	1, if the MSME has ever defaulted on repayment 0, otherwise
Guaranteed Coverage	The extent to which the credit guarantee scheme covers the loan	Percent of credit guarantee scheme loan cover / credit guarantee coverage ratio
Disbursement	Loan amount disbursed to the MSME	Natural log of the total amount of loan disbursed to the MSME
Age	The number of years the MSME has been operational	
Sector	Refers to the sector within which the MSME is licensed to operate	Sectoral dummies for Agriculture, Building & construction, Trade, Energy & water, Manufacturing, Mining, Tourism, Transport & communication
Facility type	Refers to the type of loan to the MSME mainly defined by the intended purpose of the loan	Loan type dummies for Working capital finance, Term loan, Bank guarantee, Contract finance, stock finance, Post import finance, Invoice discounting, Bond & Performance guarantee.

3.4 Study data

The study applies mixed approaches in line with the study specific objectives. Firstly, the study utilizes MSME data under specific guarantee scheme facility managed by a tier 1 bank. Specifically, the study utilizes data for 2398 MSMEs borrowers under this specified credit guarantee fund from 2022 to February 2025.

4.0 Findings

4.1 Descriptive statistics

The study covered 2,398 MSMEs under the credit guarantee scheme for 2022 to 2025 period. Descriptive statistics results indicate that 8.3 percent of MSMEs have defaulted on their loan repayments for the period under review. Guarantee coverage for the 2,398 firms averages 52.6 percent with the lowest being 4 percent and highest 75 percent cover. The age of the firm reveals that the oldest firm is 32 years with the recently registered at 1 year old. Regarding the loan disbursements amount, the minimum disbursement is Kes 25,000 while maximum disbursement is Kes 12 million.

Disaggregation of the loan type indicates that 12.4 percent of MSMEs have sought facility enhancement either by amount or coverage ratio, 5 percent sought for extension, 82 percent are new facilities while 16.3 percent sought for facility renewals upon their expiry. Regarding the purpose of the facility, majority of the MSMEs have been borrowing for contract financing (95.8 percent), stock financing (58.3 percent) while the remainder was for post import financing (0.6 percent). Sector wise, majority of the MSMEs covered operate in trade sector (35.8 percent) followed by manufacturing (30.0 percent) with the least operating in agriculture (1.5 percent).

Table 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Default	2398	0.083	0.275	0	1
Guaranteed Coverage	2398	0.526	0.127	0.04	0.75
Age	2398	12.484	7.784	1	32
Amount disbursed	2398	4427613	7213578	25000	12,000,000
Enhanced facilities	2398	0.124	0.329	0	1
Extension	2398	0.050	0.217	0	1
New	2398	0.827	0.379	0	1
Renewal	2398	0.163	0.370	0	1

Variable	Obs	Mean	Std. Dev.	Min	Max
Post import finance	2398	0.006	0.079	0	1
Stock finance	2398	0.583	0.493	0	1
Term loan	2398	0.015	0.120	0	1
Working capital finance	2398	0.015	0.120	0	1
Bank guarantee	2398	0.042	0.200	0	1
Contract finance	2398	0.958	0.200	0	1
Invoice discounting	2398	0.098	0.297	0	1
Term Loan	2398	0.063	0.243	0	1
Performance guarantee	2398	0.023	0.148	0	1
Agriculture	2398	0.015	0.120	0	1
Building & construction	2398	0.050	0.219	0	1
Trade	2398	0.358	0.480	0	1
Energy & water	2398	0.042	0.201	0	1
Manufacturing	2398	0.299	0.458	0	1
Mining	2398	0.153	0.497	0	1
Tourism	2398	0.093	0.290	0	1
Transport & Communication	2398	0.066	0.249	0	1

4.2 Credit guarantee fund and improved access to formal financing

Credit guarantee's impact on the MSEs access to formal credit is analyzed using repeat customers largely categorized as renewals. Out of the 2,398 SMEs covered by the study, 392 SMEs accounting for 16.35 percent are repeat customers. This represents a fair improvement in access to formal credit under the credit guarantee scheme covered by the study. A further analysis of the improved access across the facility type reveals that improved credit access by SMEs was more in stock financing, invoice discounting, contract financing and bank guarantee. No improved access was reported for term loans and post – import finance facilities.

Table 3: Cross tabulation of repeat borrowing and facility type

Renewal	Facility type			Chi2 Analysis
	Post Import Finance			
Renewal	0	1	Total	
0	99.25	0.75	100.00	Pearson Chi2 = 2.95 Prob = 0.0859
1	100.00	0.00	100.00	
Total	99.37	0.63	100.00	
Renewal	Stock Finance			
	0	1	Total	Pearson Chi2 = 48.95 Prob = 0.0000
0	44.82	55.18	100.00	
1	25.77	74.23	100.00	
Total	41.70	58.30	100.00	
Renewal	Term Loan			
	0	1	Total	Pearson Chi2 = 6.94 Prob = 0.0084
0	98.26	1.74	100.00	
1	100.00	0.00	100.00	
Total	98.54	1.46	100.00	
Renewal	Working Capital Financing			
	0	1	Total	Pearson Chi2 = 2.94 Prob = 0.0866
0	98.35	1.65	100.00	
1	99.49	0.51	100.00	
Total	98.54	1.46	100.00	
Renewal	Bank guarantee			
	0	1	Total	Pearson Chi2 = 16.38 Prob = 0.0001
0	96.56	3.44	100.00	
1	92.09	7.91	100.00	
Total	95.83	4.17	100.00	

Renewal	Facility type			Chi2 Analysis
	Post Import Finance			
Renewal	Contract Finance			
	0	1	Total	Pearson Chi2 = 16.38 Prob = 0.0001
0	3.44	96.56	100.00	
1	7.91	92.09	100.00	
Total	4.17	95.83	100.00	
Renewal	Invoice Discounting			
	0	1	Total	Pearson Chi2 = 13.00 Prob = 0.0003
0	89.23	10.77	100.00	
1	95.15	4.85	100.00	
Total	90.20	9.80	100.00	
Renewal	Performance Guarantee/bond			
	0	1	Total	Pearson Chi2 = 3.23 Prob = 0.0724
0	97.51	2.49	100.00	
1	98.98	1.02	100.00	
Total	97.75	2.25	100.00	
Renewal	Letter Of Credit			
	0	1	Total	Pearson Chi2 = 4.92 Prob = 0.0265
0	98.26	1.74	100.00	
1	99.74	0.26	100.00	
Total	98.50	1.50	100.00	

Effect of guarantee coverage on default probability

In addition to examining the effect of credit guarantee funds on MSMEs access to formal finance, the study evaluates how the credit guarantee funds affect MSMEs probability of default. To achieve this, a probit model is estimated by regressing default on guarantee coverage, amount disbursed and other firm level characteristics such as the age of the firm. Model 1 presents the results of probability default regression on loan amount and firm age. The results

confirm moral hazard effect of credit guarantees, implying that default probability increases with an increase in the guarantee coverage ratio by 30.2 percent. However, the moral hazard effect on default probability is not significant. From the results, age of

the firm has negative effect on default risk, supporting the fact that older firms are less likely to default on their loan repayments compared to young firms by 4.2 percent. Therefore, the loan default risks decline with increase in firm age.

Table 4: Probit regression model 1

Default	Coef.
Guaranteed Coverage	0.302 (0.283)
Disbursement	0.133*** (0.031)
Age	-0.042*** (0.007)
Constant	-3.049*** (0.500)

*** $p < .01$, ** $p < .05$, * $p < .1$; Significance levels in parenthesis

The probit model is further extended to include the MSMEs sector of operation and purpose of the facility. The analysis includes agriculture, building and construction, trade, energy & water, manufacturing, mining, tourism, transport & communication which are the key sectors covered by study data. Results for the extended model are presented in table 4.4. Regarding facility type, the study covered stock finance, working capital, bank guarantee, invoice discounting and term loan. Upon inclusion of sector and facility type in the model, the moral hazard effect of the credit guarantee

fund is still present, though insignificant, with credit guarantee fund likelihood of default at 10.1 percent. Sector-wise, results indicate default is elevated in agriculture, building and construction and trade sectors significant and 1, 5 and 1 percent respectively. Regarding the facility type, default is elevated in term loans with a default probability of 56.6 percent significant at 1 percent significance level. Therefore, the result reveals reasonable sectoral bias in MSMEs default probability with facility type default bias appearing relatively muted.

Table 5: Probit regression model 2

Default	Coef.		t-value
Guaranteed coverage	0.101	(0.345)	0.29
Disbursement	0.020	(0.031)	0.66
Age	-0.036***	(0.008)	-4.24
Agriculture	1.690***	(0.303)	5.58
Building & Construction	0.595**	(0.245)	2.43
Trade	0.441***	(0.171)	2.58
Energy & water	0.177	(0.264)	0.67
Manufacturing	-0.202	(0.244)	-0.83
Mining	0.218	(0.140)	1.55
Tourism	-0.307	(0.397)	-0.77
Transport & communication	0.185	(0.239)	0.78
Stock finance	0.034	(0.113)	0.30
Working capital	-0.041	(0.301)	-0.14
Bank guarantee	-0.309	(0.262)	-1.18
Invoice discounting	-0.371	(0.348)	-1.07
Term loan	0.566***	(0.159)	3.56
Constant	-1.791***	(0.539)	-3.32

*** p<.01, ** p<.05, * p<.1; Significance levels in parenthesis

To further investigate the moral hazard effect of credit guarantee funds at sectoral level, short run models are fitted at sector level. Results for sectoral short run models are presented in table 4.5. They reveal that moral hazard effect of credit guarantee funds is elevated in agriculture, building and construction, trade and manufacturing sectors significant at 1 percent significance level. Moral hazard effect of credit guarantee funds is present but insignificant in energy and water, mining, tourism and transport sectors. The results confirm the presence of sectoral credit guarantee funds moral hazard bias in Kenya. Across all the sectors, default risk reduces with firm age and increases with loan amount. Differences in sectoral loan defaults support the sectoral seasonality that in turn affect MSMEs cashflows hence, their loan repayment ability. The finding supports assigning of sectors specific risk scores thus differentiated sectoral risk scoring credit models to cushion banks from sectoral inherent risks.

Table 6: Probit regression model 3

Default	(1)	2	3	4	5	6	7	8	9
Guaranteed coverage	0.302 (0.283)	0.064** (2.428)	0.905*** (1.212)	0.408** (0.357)	0.959* (2.838)	0.251*** (1.071)	0.618* (0.355)	2.834 (1.997)	8.275 (5.827)
Disbursement	0.133*** (0.031)	0.312 (0.318)	0.051 (0.146)	0.095* (0.046)	0.13 (0.297)	0.09 (0.115)	0.100** (0.038)	0.257 (0.177)	0.461 (.319)
Age	-0.042*** (0.007)	0.255* (0.147)	-0.040 (0.039)	-0.045*** (-0.11)	-0.12** (0.035)	-0.064*** (0.022)	-0.041*** (0.01)	0.052 (0.047)	-0.251*** (0.05)
Constant	3.049 (0.5)	0.060 (5.07)	-4.143** (2.099)	1.537** (0.78)	-7.278 (5.107)	-3.808** (1.701)	-2.007*** (0.615)	-4.643* (2.759)	-8.9 (6.618)

*** p<.01, ** p<.05, * p<.1; Significance levels in parenthesis, Models: Agriculture (2), Building and Construction (3), Trade (4), Energy & water (5), Manufacturing (6), Mining (7), Tourism (8) transport (9)

5.0 Conclusion and Policy Suggestions

5.1 Conclusion

The study sought to examine the effects of credit guarantee schemes on Micro, Small and Medium-sized Enterprises lending in Kenya. The study examined the performance of a specific credit guarantee scheme, effect of the guarantee scheme on probability of default and how the effect changes across sectors.

Using bank level data for 2,398 MSMEs under the scheme, the study found that credit guarantee scheme has improved MSMEs access to formal credit. Out of the total firms covered, 392 firms representing 16.3 percent have sought for facility renewal upon the expiry of the previous facility. Furthermore, 12.4 percent have sought for the enhancement of their previous facility either in loan amounts or in coverage ratio.

Regarding the portfolio quality, the study established that out of the 2,398 MSMEs analysed, 198, equivalent to 8.3 percent had defaulted on their loan repayment. This result represents low default on firm count basis implying good credit quality.

Concerning credit guarantee – default probability nexus, the study established existence of moral hazard effect, though statistically insignificant. However, sector wise, short run models indicate credit guarantee moral hazard sectoral bias, largely elevated in agriculture, building and construction, trade and manufacturing sectors. On the other hand, default risk was found to reduce with firm age and increases with loan amount.

5.2 Policy Suggestions

Based on the study finding that credit guarantee schemes enhance MSME credit access above the available suitable collateral level, we recommend for provision of incentives for lenders to engage into more or enhanced partnership with credit guarantee institutions.

The Existence of elevated sectoral moral hazards effect of credit guarantee calls for need for sector differentiated credit scoring models for credit guarantee backed lending as opposed to a standard or vanilla credit scoring model. This is likely to lower default probability. Moreover, the findings form valuable input into the review of credit standards and redesign of current guarantee schemes.

Additionally, the firm-age effect findings point toward a need for financial institutions to train their customers on entrepreneurship, especially young MSMEs.

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