

## **Influence of Collaterals on Financial Inclusion in Machakos County, Kenya**

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### **Abstract**

The paper sought to establish the influence of collaterals on financial inclusion in Machakos County. The study adopted a descriptive research design while targeting micro enterprises operating in Kenya with a special focus to Machakos County. The researcher used purposive sampling technique to select the sample for the study. Questionnaire was used for data collection as it was cost effective as opposed to other instruments. To enhance validity in the study, content related validity of the questionnaire was used. On the other hand, reliability was assessed using the test-retest method and was done alongside the pilot study. The study established that Collateral and financial inclusion are positively and significantly related ( $\beta = 0.154$ ,  $p=0.002$ ). Based on the findings of the study, the study recommends that the level of usage of mobile and internet banking should be increased by micro-enterprises. This means customers should have more freedom and frequency in paying for the goods and services provided by micro-enterprises through mobile and internet banking. Though tremendous improvement has been achieved, a lot has to be done regarding the number of transactions transacted through the mobile and internet platforms are still low.

**Key Words:** Collateral, Financial Inclusion, Innovation, Micro Enterprise

### **Background of the Study**

The rapid growth in mobile banking and internet banking in Africa has resulted in the achievement of greater financial inclusion by bringing increasingly refined and lower cost financial services to disadvantaged groups in the rural areas. The expansion of mobile banking has enabled the Micro Enterprises (MEs) to save, undertake transactions and access low cost credit without necessarily having security for their loans. Mobile banking and internet banking provides MEs in developing countries the opportunity to get low cost financial services without necessarily going physically to the bank.

The Kenyan problem is that most micro enterprises in the rural areas lack access to financial services. The Small and micro enterprises have been excluded from accessing credit, savings, payments, and insurance and even remittance services. The future of financial institutions is to come up with innovations that will work towards financial inclusion of the MEs with the main agenda being to check on the rate at which financial services are being delivered to this particular segment of the economy.

### **Collaterals**

Collateral refers to security or guarantee for the loan borrowed. Collateral acts as an indication enabling a financial institution to attenuate or eliminate the adverse selection problem caused by the existence of information asymmetries between the bank and the borrower at the time of the loan decision. Although bank knows the credit quality of the customers, the collateral helps to alleviate moral hazard problems once the loan has been granted. Consequently, problem of moral hazard faced by the bank in lending could be restrained by having collateral. As stated by Aghion and Bolton (1992), collateral can therefore be seen as an instrument ensuring good behavior on the part of borrowers, given the

existence of a credible threat. Hasnah et al. (2012), has found that character/management plays a significant role on the probability of loans approved by credit officers.

Formal and informal banking institutions always demand collateral to act as a security on loans which is not the case for accessing credit on the Mobile banking platform (Thuranira, 2009). This is often in the form of houses or deed to some immovable assets. This precondition plays a major part in the accessibility of loans and the situation may be more complicated for women entrepreneurs, who may not have right of ownership to expensive property including land and houses. Women's access to finance especially at the micro enterprise level is a major constraint to start and expand businesses (Langowitz & Minniti, 2007). According to Beaver (2002) the historical development and the associated culture, of the banking system underpin the problem of the emphasis on the provision of collateral as a primary condition in lending. Banks have always adopted a risk averse stance towards small firms, with an accompanying inability to focus on the income generating potential of the venture, when analyzing the likelihood of loan repayment.

Jiménez et al. (2006) found a positive relationship between duration and the likelihood of collateral pledging for borrowers with known low credit quality, giving support to the hold-up proposition. They also found that if a firm works with multiple banks, it increases the probability of pledging collateral for long term loans while it decreases the probability of pledging collateral when acquiring short term loans. Collateral is often considered as part of the supply function for bank debt (Ogawa & Suzuki, 2000; Shen, 2002; Atanasova and Wilson, 2004). A higher availability of collateral is expected to increase the supply of bank debt since collateral can mitigate the informational asymmetries between borrower and lender. Increasing the supply of bank debt for a certain firm decreases the probability of creating an excess demand and thus decreases the probability of credit rationing. Hence, collateral can help solving credit rationing for any specific firm. Chan and Kanatas (1985) consider business collateral as an asset belonging to the borrowing firm, that will be transferred to the lender in the event of default. As such, business collateral (or inside collateral) does not increase the assets that the borrower would lose in case of default, since the entire borrower's assets are attachable. Personal collateral/guarantee refers to assets not belonging to the legal entity of the firm but provided by an external party or owner/manager of the firm.

### **Financial Inclusion**

According to Demircuc (2008), financial inclusion or broad access to financial services is defined as an absence of price and non-price barriers in the use of financial services. Financial services should be accessible to all as this is often seen as the goal of financial inclusion. Financial services provided should also be of quality: quality financial inclusion includes the following traits: affordability, convenience, product-fit, safety, dignity of treatment, and client protection. Financial inclusion involves provision of the full suite of basic financial services; this refers to group of core financial services that includes basic credit, savings, insurance and payment services (Gardeva & Rhyne, 2011).

Leyshon and Thrift (1995) define financial exclusion as referring to those processes that serve to prevent certain social groups and individuals from gaining access to the formal financial system. Carbo, Gardener and Molyneux (2005) have defined financial exclusion as broadly the inability of some societal groups to access the financial system. According to Conroy (2005), financial exclusion is a process that prevents poor and disadvantaged social groups from gaining access to the formal financial systems of their countries. According to Mohan (2006), financial exclusion signifies the lack of access by certain segments of the

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society to appropriate, low-cost, fair and safe financial products and services from mainstream providers.

Millions of people across the developing world do not have access to banking services. Faced with barriers related to cost, geography and education, these individuals have no way of securely transferring funds, saving money, insurance or accessing credit (BASA, 2003). The four services serve different needs that the MEs encounters, and ensuring access to this product range is an important goal of financial inclusion. Credit allows consumers to use future income to manage current liabilities or to capitalize on investment opportunities. Savings provide a safe and secure place where households can store funds and hence discounting their future with some degree of certainty.

### **Problem Statement**

The financial system in Kenya still remains under-developed as compared to other developed economies. With the invention of mobile and internet banking, Kenya has experienced positive growth in the financial sector in the recent years. Financial services including credit, payment of services and savings are currently being offered to Micro enterprises through mobile and internet banking thus increasing financial inclusion. The majority of the Kenyan population resides in the rural areas (about 65%) and only 5% of the rural populations have access to banking facilities so the teething problem is that the majority of the micro-enterprises run by the rural population are excluded. Mobile banking has been viewed as a solution to financial inclusion and the challenge is to confirm whether mobile banking is the solution to financial inclusion in Kenya. The majority of the micro-enterprises operating in rural areas in Kenya remain ‘unbanked’ with majority being excluded in the mainstream financial services. Some of the factors that have been cited as causing the enterprises not to take banking services are; inaccessibility, inconvenience and high costs (World Bank, 2015).

A study on internet banking by ACNielsen (2002) established that use of internet banking is increasing in developing countries but it is still lower than expected. Due to these slow adoption rates, the transformation of banking services from the traditionally known physical branches commonly referred to ‘bricks and mortar’ to the modern way through information and communication technology systems better known as ‘clicks and mortar’ is yet to be realized to the extent it was predicted (Bradley & Stewart, 2002). In Kenya for instance, internet banking has been ranked as less important than other channels such mobile banking (World Bank, 2013).

### **Objectives of the Study**

To establish the influence of collaterals on financial inclusion in Machakos County

### **Literature Review**

#### **Diffusion Innovations Theory (DIT)**

According to Rogers (1995) who developed this theory, innovation is an idea, act, or instrument that is new to an individual or a group of people while diffusion is a process in which new technology is transferred through certain channels of communication in time among individuals who are targeted to use new Information System. Diffusion Innovations Theory has five innovation characteristics thus relative advantage, compatibility, complexity and observability. These variables may look different and unrelated to each other but in reality have everything to do with each other in the context of Information system, others have argued that Technology Acceptance Model and Diffusion Innovations Theory are only theoretically related to each other. Moore and Benbasat (1991) established that the relative

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advantage construct Diffusion Innovations Theory is similar to the notion of the PU in Technology Acceptance Model, and the complexity construct in Diffusion Innovations Theory captures the Perceived Usefulness in the technology acceptance model, although the variables sound different. According to Medlin, (2001) and Parisot (1995) Rogers' diffusion of innovations theory is the most appropriate theory among all theories for investigating the adoption of technologies in higher education and educational environments.

The main aim of adoption is that the person must perceive the idea, behavior or product as new or innovative, this makes diffusion possible. Diffusion of innovation theory tries to explain and describe ways in which new inventions which in our case is internet and mobile banking are adopted and become successful (Clark, 2012). Innovations can take a long time before they get adopted and not all inventions get adopted regardless their quality (Mannan, 2013). He also stated that resistance to change may hinder diffusion of innovation although it might not stop the innovation, it will slow it down.

Rogers (1995) came up with five critical attributes that have a great influence on the rate of adoption. These attributes include relative advantage, compatibility, trialability, complexity and observability. If a financial institution sees the benefits that come with mobile and internet banking, they adopt these innovations provided other factors like availability of the required tools. Adoption of mobile and internet banking is faster in areas and organizations that have internet access and information technology departments than those without.

It might seem like these models are different and unrelated with each other but they are related in the context of information systems. Some researchers have argued that TAM and IDT are only related theoretically. Moore and Benbasat (1991) found out that the relative advantage construct in IDT is similar to the notion of the PU in TAM, and the complexity construct in IDT captures the PEU in the technology acceptance model, although the variables sound different. Rogers (1995) defined innovation as an idea, act or instrument that is new to a person or a group of people. He also defined diffusion as a process by which technology is transferred through different channels of communication in time among the targeted group who will use the new information system.

### **Empirical Studies**

A study by Jiménez et al. (2006) found a positive relationship between relationship duration and the likelihood of collateral pledging for borrowers with known low credit quality, giving support to the hold-up proposition. They also found that if a firm works with multiple banks, it increases the probability of pledging collateral for long term loans while it decreases the probability of pledging collateral when acquiring short term loans.

Gakuu, Wachira and Kagwiria (2015) conducted a study on influence of collateral requirements on SACCO's credit accessibility in Imenti North Sub-County, Kenya. The general objective of the study was to assess the influence of collateral requirements on credit accessibility of SACCO's in Imenti North Sub-County, Kenya. The target population of the study was 34 registered SACCO's which offers credit and the management employees were the study respondents. Results revealed that collateral requirements have a moderate influence on credit accessibility in SACCO's. Pearson correlations also indicated that collateral requirements have a major positive significance contribution on credit accessibility. It was recommended that SACCO's should therefore possess a wide range of collaterals and also develop a policy which allows the use other forms of collateral other than guarantors and shares only. This will certainly increase access to credit in SACCO's.

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Kung'u (2011) conducted a survey Westlands town, Kenya to examine factors affecting credit access to SMEs. Data was collected using 115 questionnaires. Participants were randomly selected from 6 sectors, namely industrial, technology, electrical, shopping, building and travel. This study found that starts up business (those under 3 years) were faced with credit access, setbacks due to lack of collateral and information. However Kung'u did not test the significance or the relationship of these variables. So Kung'u ignored testing hypothesis, in using a purely descriptive approach, though the study would also have tested whether there was a relationship between collateral security and if it was significant or not. This study, therefore will aim to not only know the factors affecting SMEs in accessing credit, but also will establish the relationship and significance.

### **Research Methodology**

The study adopted a descriptive research design. The study was targeting micro enterprises operating in Kenya with a special focus to Machakos County. Purposive sampling technique was used to select the sample for the study. Questionnaire was used for data collection as it was cost effective as opposed to other instruments. Pilot testing involved 10 businesses which were not included in the final sample. To enhance validity in this study, content related validity of the questionnaire will be used. On the other hand, reliability was assessed using the test-retest method and was done alongside the pilot study. The researcher will select a pilot group comprising 10% of the sample. The research instruments were tested for reliability using the split half method. This was done by collecting data from 10 respondents. Data was verified and edited for completeness and consistency. Content analysis and descriptive analysis was employed. Regression analysis was applied to establish the relationship between the variables.

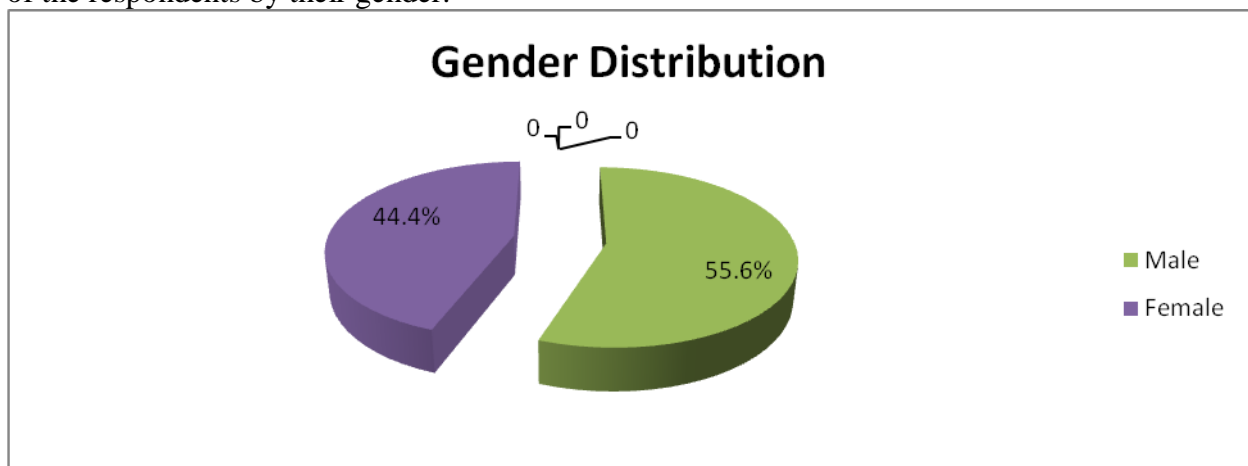
### **Results and Discussions**

#### **Background Information**

This section presents personal information of the respondents who participated in the research study. The study sought to establish brief background information about the respondents. They were asked to state their gender and age.

#### **Gender Distribution**

The study required the respondents to indicate their gender. Figure 1 presents the distribution of the respondents by their gender.



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### **Figure 1: Gender Distribution of Respondents**

From the findings, the study established that, majority of the respondents as shown by 55.6% were males whereas 44.4% of the respondents were females. This is an indication that both genders were involved in this research and thus the findings of this study did not suffer from gender biasness.

### **Age Distribution of the Respondents**

The researcher also sought to investigate the distribution of age among the respondents. Table 1 presents the distribution of the respondents by age.

**Table 1: Age Distribution**

| <b>Age Distribution</b> | <b>F</b>   | <b>%</b>    |
|-------------------------|------------|-------------|
| Below 25 years          | 160        | 33.7        |
| 25-35 Years             | 142        | 29.9        |
| 36-50 Years             | 82         | 17.3        |
| 51-60Years              | 81         | 17.1        |
| Over 61 Years           | 10         | 2.1         |
| <b>Total</b>            | <b>475</b> | <b>100%</b> |

The results indicated that majority of the respondents (33.7%) were below the age of 25 years, 29.9% were aged between 25-35 years, 17.3% were aged between 36-50 years while only 2.1% were age above 61. The findings imply that there were a high proportion of respondents who were young and tech savvy individuals with vast knowledge and experience on the use of mobile and internet banking and therefore the researcher obtained accurate and reliable information for the study.

### **Descriptive Statistic**

The study sought to determine the extent to which respondents agree with factors relating to collateral and financial inclusion among micro-enterprises in Machakos County. The response was rated on a scale of 1-5 on which: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree. The findings are presented on table 2.

**Table 2: Collateral and Financial Inclusion**

|  | <b>Mean</b> | <b>Std.Dev</b> |
|--|-------------|----------------|
| Mainstream financial institutions insist on the provision of collateral by micro enterprises   | 4.09        | 0.7            |
| While addressing the likelihood of loan repayment, mobile banking providers adopt a risk averse stance towards micro enterprises                               | 4.35        | 3.77           |
| The requirement by mainstream financial institutions that micro enterprises provide security for loans have pushed the enterprises to embrace mobile banking   | 3.89        | 0.91           |
| The requirement by mainstream financial institutions that micro enterprises provide security for loans have pushed the enterprises to embrace internet banking | 3.68        | 1.06           |
| It is easy to provide collateral for a loan in the mainstream financial institutions   | 3.73        | 1.17           |
| The security required for bank loans is affordable to my enterprises   | 4.02        | 0.85           |
| <b>Average</b>   | <b>3.96</b> | <b>1.41</b>    |

Based on the findings, the respondents agreed to the statement that mainstream financial institutions insist on the provision of collateral by micro enterprises (Mean=4.09; SD=0.7). In addition, majority of the respondents agreed with the statement that while addressing the likelihood of loan repayment, mobile banking providers adopt a risk averse stance towards micro enterprises (Mean=4.35; SD=3.77).

The results showed that majority of the respondents agreed with the statement that the requirement by mainstream financial institutions that micro enterprises provide security for loans have pushed the enterprises to embrace mobile banking (Mean=3.89; SD=0.91). The results further showed that majority of the respondents strongly agreed with the statement that the requirement by mainstream financial institutions that micro enterprises provide security for loans have pushed the enterprises to embrace internet banking (Mean=3.68; SD= 1.06). However, the respondents agreed with the statement that it is easy to provide collateral for a loan in the mainstream financial institution (Mean=3.73; SD=1.17).

The results further showed that majority of the respondents agreed with the statement that the security required for bank loans is affordable to my enterprises (Mean=4.02; SD=0.85). These findings agreed with that of Jiménez et al. (2006) found a positive relationship between relationship duration and the likelihood of collateral pledging for borrowers with known low credit quality, giving support to the hold-up proposition. The results were also consistent with that of Vuvor and Ackah (2011) who found that inability of SMEs to provide collateral and other information needed by banks such as audited financial statement coupled with the high cost of loan in terms of high interest rates has it extremely difficult for micro-enterprises to access bank loans.

### **Correlation between Collateral and Financial Inclusion**

This study sought to establish whether there was any form of correlation between collateral and financial inclusion. The findings are summarized in Table 3.

**Table 3: Correlation between Collateral and Financial inclusion**

|                     |                     | Financial Inclusion | Collateral |
|---------------------|---------------------|---------------------|------------|
| Financial Inclusion | Pearson Correlation | 1                   | .466**     |
|                     | Sig. (2-tailed)     |                     | 0          |
| Collateral          | Pearson Correlation | .466**              | 1          |
|                     | Sig. (2-tailed)     | 0.000               |            |

\*\* Correlation is significant at the 0.01 level (2-tailed).

From the table 2, a positive correlation coefficient of .466 (or 46.60%) existed between collateral and financial inclusion. These findings agreed with that of Jiménez et al. (2006) found a positive relationship between relationship duration and the likelihood of collateral pledging for borrowers with known low credit quality, giving support to the hold-up proposition. The results were also consistent with that of Vuvor and Ackah (2011) who found that inability of SMEs to provide collateral and other information needed by banks such as audited financial statement coupled with the high cost of loan in terms of high interest rates has it extremely difficult for micro-enterprises to access bank loans.

#### **Bivariate Analysis of Collateral and Financial Inclusion of micro-enterprises**

The study conducted a regression analysis between Collateral and Financial Inclusion among micro-enterprises in Kenya. The findings were presented in Table 4.26. This Model Summary Table presents an R<sup>2</sup> result of .218 or 21.8%, meaning that the independent variable, collateral alone can explain up to 21.8% of the total variability in the dependent variable, Financial Inclusion of micro-enterprises in Kenya. The remaining 79.2% of the variation in the dependent variable is unexplained by this one predictor model but by other factors not included in the model.

**Table 4: Model Summary of regression between Collateral and Financial Inclusion**

| Model | R     | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------|----------|-------------------|----------------------------|
| 1     | .466a | 0.218    | 0.216             | 0.55183                    |

*Dependent Variable: Financial inclusion*

An ANOVA test was performed on collateral and the results obtained are presented in Table 3. From the ANOVA Table 4, the model is statistically significant as the p-value is less than .05. The values of  $F(1, 473) = 78.425$ ,  $P < 0.05$ , shows that collateral statistically and significantly predicts the financial inclusion (i.e., the regression model is a good fit of the data) and that collateral significantly influence the financial inclusion of micro-enterprises in Kenya. This means that alternative hypothesis that collateral has a statistically significant influence on financial inclusion is accepted. These findings agreed with that of Jiménez et al. (2006) found a positive relationship between relationship duration and the likelihood of collateral pledging for borrowers with known low credit quality, giving support to the hold-up proposition. These findings agreed with that of Vuvor and Ackah (2011) who found that inability of SMEs to provide collateral and other information needed by banks such as audited financial statement coupled with the high cost of loan in terms of high interest rates has it extremely difficult for micro-enterprises to access bank loans.



**Table 5: ANOVA for regression between Collateral and Financial Inclusion**

|            | Sum of Squares | df  | Mean Square | F       | Sig.              |
|------------|----------------|-----|-------------|---------|-------------------|
| Regression | 40.052         | 1   | 40.052      | 131.527 | .000 <sup>b</sup> |
| Residual   | 144.035        | 473 | 0.305       |         |                   |
| Total      | 184.087        | 474 |             |         |                   |

To complement the ANOVA findings on correlation between collateral and financial inclusion of micro-enterprises presented in Table 6, Person’s correlation coefficients were also generated. The results of the person’s correlation are presented in Table 6. These results show that regulatory framework contributes a statistically significant value (p-value = .000) of the regression model.

**Table 6: Coefficients of regression between Collateral and Financial Inclusion**

|            | B     | Std. Error | t      | Sig.  |
|------------|-------|------------|--------|-------|
| (Constant) | 1.568 | 0.171      | 9.191  | 0     |
| collateral | 0.511 | 0.045      | 11.469 | 0.000 |

*Dependent Variable: Financial inclusion*

From the coefficient Table 6, correlation between collateral and financial inclusion in Kenya contributes a statistically significant value (p-value = .000) of .511. Using the summary presented in Table 5, a linear regression model of the form,

$Y = \beta_0 + \beta X_1 + \varepsilon_i$  can be fitted as follows:

$$Y = 1.561 + 0.511 \text{ Collateral} + 0.045 \dots \dots \dots \text{Equation 1}$$

The model shows that collateral affects the financial inclusion of micro-enterprises, that is, an increase in mean index of collateral increases the financial inclusion of micro-enterprises in Kenya by a positive unit mean index value of 0.511. The study sought to establish the influence of collateral as a function of financial inclusion among micro-enterprises in Kenya. The multiple regression analysis results indicate that collateral has a positive statistically significant predicts the financial inclusion;  $p < 0.05$  ( $p=0.000$ ) i.e. an increase in mean index of collateral increases financial inclusion by a positive unit mean index value of .351 per cent. Hence, collateral significantly influences the financial inclusion of micro-enterprises these findings support the study by Gangata and Matavire (2013) on challenges faced by micro-enterprises in accessing finance from financial institutions, the study findings established that very few micro-enterprises succeed in accessing credit facilities from formal financial institutions, the main reason being failure to meet lending requirements, chief among them being provision of collateral security. However, with internet and mobile banking, micro-enterprises can now access credit without the need of having collateral. A study conducted by Vuvor and Ackah (2011) on the challenges facing micro-enterprises in accessing credit also revealed that the inability of SMEs to provide collateral and other information needed by banks such as audited financial statement coupled with the high cost of loan in terms of high interest rates has it extremely difficult for micro-enterprises to access bank loans.

**Hypothesis testing of Collateral and Financial Inclusion of micro-enterprises**

The hypothesis was tested by using multiple linear regression (table 5, above). The acceptance/rejection criteria was that, if the p value is greater than 0.05, the  $H_{01}$  is not rejected but if it’s less than 0.05, the  $H_{01}$  fails to be accepted.

The null hypothesis was that there is significant relationship between collateral and financial inclusion of micro-enterprises in Machakos County. Results in Table 4.31 above

show that the p-value was  $0.000 < 0.05$ . The results in table 4.31 further revealed that  $t_{cal} (131.527) > t_{critical} (1.96)$  and thus the null hypothesis was rejected. This indicated that the null hypothesis was rejected hence there is a significant relationship between collateral and financial inclusion of micro-enterprises in Machakos County. Therefore the study concluded that collateral influence financial inclusion of micro-enterprises in Machakos County. These findings agreed with that of Jiménez et al. (2006) found a positive relationship between relationship duration and the likelihood of collateral pledging for borrowers with known low credit quality, giving support to the hold-up proposition. The results were also consistent with that of Vuvor and Ackah (2011) who found that inability of SMEs to provide collateral and other information needed by banks such as audited financial statement coupled with the high cost of loan in terms of high interest rates has it extremely difficult for micro-enterprises to access bank loans.

### **Conclusion and Recommendation**

Based on the findings, mainstream financial institutions insist on the provision of collateral by micro enterprises. In addition the study found that while addressing the likelihood of loan repayment, mobile banking providers adopt a risk averse stance towards micro enterprises. The results also revealed that requirement by mainstream financial institutions that micro enterprises provide security for loans have pushed the enterprises to embrace mobile banking. The results also showed that mainstream financial institutions that micro enterprises provide security for loans have pushed the enterprises to embrace internet banking. However the study found that it is not easy to provide collateral for a loan in the mainstream financial institutions. The results also showed that security required for bank loans is not affordable to most enterprises.

A correlation analysis was conducted between collateral and financial inclusion. The findings showed a positive correlation coefficient of .466 (or 46.60%) existed between collateral and financial inclusion. Further, a regression analysis between the two variables was done, the model obtained showed that collateral affects the financial inclusion of micro-enterprises, that is, an increase in mean index of collateral increases the financial inclusion of micro-enterprises in Kenya by a positive unit mean index value of 0.351. The regression analysis results indicated that collateral has a positive statistically significant predicts the financial inclusion;  $p < 0.05$  ( $P=0.000$ ) i.e. an increase in mean index of collateral increases financial inclusion by a positive unit mean index value of .511 per cent. Hence, collateral significantly influences the financial inclusion of micro-enterprises. Model Summary presented an  $R^2$  result of .218 or 21.8%, meaning that the independent variable, collateral alone can explain up to 21.8% of the total variability in the dependent variable, Financial Inclusion of micro-enterprises in Kenya. The remaining 79.2% of the variation in the dependent variable is unexplained by this one predictor model but by other factors not included in the model. From hypothesis testing the study found that collateral have a significant effect on financial inclusion of micro-enterprises in Machakos County. In addition collateral have a significant effect on financial services technology innovation of micro-enterprises in Machakos County

### **Conclusion**

Based on the findings, the study concluded that collateral have a positive and significant effect on financial inclusion. In addition, mobile and internet banking have improved the access to financial services by micro-enterprises. This is seen through improved business

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growth among the enterprises as they can access low cost credit for business growth. The low cost of credit for the micro-enterprises has improved the level of financial inclusion.

### **Recommendations**

Based on the findings of the study, the study recommends that the level of usage of mobile and internet banking should be increased by micro-enterprises. This means customers should have more freedom and frequency in paying for the goods and services provided by micro-enterprises through mobile and internet banking. Though tremendous improvement has been achieved, a lot has to be done regarding the number of transactions transacted through the mobile and internet platforms are still low.

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