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Effects Of Collateral On Loan Repayment: Evidence From An Informal Lending Institution

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ABSTRACT

We examine the effect of the collateral informal lenders use to ensure loan repayment. Specifically we measure how the use of movable and immovable assets affects loan repayment and delinquency rate, and assess the extent to which guarantorship and relationship-lending act as collateral to improve loan repayment. With a dataset of 835 individual borrowers drawn from an informal Tanzanian lending institution, we run descriptive and econometric models. The results suggest that movable assets increase the likelihood that borrowers perceived to be less creditworthy will obtain loans from informal sources and repay them. We also find a small proportion of customers to have pledged immovable assets as collateral when borrowing from informal lenders. The results also show the positive effect of referral, which implies that relationship lending and social collateral is key to increasing access to finance through informal lenders. Our results contribute to the advancement of economic theory, specifically in the ex-ante and ex-post-related literature.

KEYWORDS

Collateral; loan repayment; informal lending; delinquency; Tanzania

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Introduction

Financial inclusion is one of the major challenges facing households and enterprises in most African countries. Owing to limited and costly financial systems, it is estimated that less than a quarter of adults in Sub-Saharan Africa have access to formal financial institutions. In Tanzania, for instance, despite the increase in the number of banks from 3 (in 2000) to 57 with 634 branches (in 2014) and the expansion of the financial sector, only 18.4% of the population are reached by formal financial institutions (FinScope, 2013). The weaknesses in financial intermediation have made it difficult for private businesses and individuals to find means of financing other than own sources and short-term credit (Charles, 2014). In the search for alternatives to formal finance, the private sector is increasingly turning to informal finance[1] (including microfinance) to meet its demand for credit, particularly small enterprises. Households and enterprises are therefore increasingly borrowing from informal moneylenders (e.g., private moneylenders, family members, small businessmen, etc.), who typically offer more flexible

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conditions than formal financial institutions (Aryeetey, 1998; Charles, 2014; Kasseeah & Thoplan, 2012). Consequently, a number of institutions have recently emerged, offering informal loans to enterprises and individuals. Although informal moneylenders charge high interest rates (Armendáriz & Morduch, 2005; Banerjee, 2003), limited access to formal financial services encourages the development of informal lending to complement or replace the formal financial sector. Accordingly, there is increasing research interest in informal lending practices and particularly in the use of collateral (Banerjee & Duflo, 2007; Barslund & Tarp, 2008). The challenge is that earlier studies documenting the use of collateral concentrate on mature markets, with greater emphasis on formal financial institutions (Banerjee & Duflo, 2007).

It is widely documented that, due to information asymmetry, most formal financiers restrict their loans to clients who can offer adequate collateral[2] (Mori & Richard, 2012). This is particularly true in developing countries, where the collateral most often deemed acceptable in formal markets is land (Beck & Demirgüc-Kunt, 2008). The difficulty of acquiring a valid title and transferring it encourages borrowers to turn to the informal credit market, where lenders are willing to accept a broader range of collateral. However, one interesting issue is how informal lenders mitigate the risk of information asymmetry and inadequate collateral, and sustain their existence. Given the puzzle of how informal lenders deal with the challenge of collateral, it is surprising that its use and role in loan recovery in the context of informal lending has rarely been examined (e.g., Banerjee & Duflo, 2007; Barslund & Tarp, 2008). The literature lacks sufficient evidence either confirming or refuting the central argument of the use of collateral to resolve the problems of adverse selection, caused by the ex-ante information gap (hidden information), and/or of the moral hazard arising from the ex-post information gap (hidden actions). Consequently, we are unaware of empirical studies that provide persuasive evidence of the causal link between the types of collateral used by informal financers and loan repayment.

While the effect of collateral on loan performance is addressed in the banking literature, there is still a knowledge gap on informal financing practices. However, in a few cases, previous research has compared the use of collateral in formal and informal lending, examined the group lending models, with joint liability as a substitute for collateral (Umoh, 2006); Postelnicu, Hermes, & Szafarz, 2013), and assessed social sanctions as a substitute for collateral in micro finance (Bond & Ashok 2002). Other studies have attempted to link the presence or lack of collateral with relationship banking (Chakraborty & Hu, 2006) and lenders' characteristics (Inderst & Mueller, 2007). However, the results on the use of collateral to reduce information asymmetry are still mixed and inconsistent.

Besides the conflicting results, prior research has not paid enough attention to specific types of collateral and their effect on loan repayment. For instance, the literature lacks convincing results showing whether immovable collateral motivates borrowers to honor their loan obligations more than movable collateral. Whereas some lenders take into account guarantorship and referrals, few studies have attempted to examine how personal loan guarantees and referrals could be used as social collateral.[3] The major concern is whether the forms of collateral accepted by informal lenders are effective enough to ensure loan repayment. In view of this, the main purpose of this paper is to examine the effect of the collateral used by informal lenders

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to ensure loan repayment. In particular, our paper aims to (i) measure the relationship between the use of collateral (movable and immovable) and loan repayment, (ii) establish the relationship between various forms of collateral and loan delinquency, and (iii) assess the extent to which guarantorship and referrals act as collateral to improve loan repayment in informal lending. Based on data obtained on individual clients of a microfinance institution in Tanzania, we demonstrate that movable assets such as motor vehicles, furniture and other domestic items increase the likelihood that borrowers perceived as less creditworthy will obtain loans from informal sources and repay them. We provide evidence that, although a small proportion of customers pledging immovable assets as their collateral when borrowing from informal lenders then delay repaying their loans, they do ultimately meet their loan obligations. The results also show the positive effects of referral (when a client is referred to a company by a friend or another client), which implies that relationship lending increases financial access to informal lenders.

The empirical setting of the study is Tanzania. As have other African countries, over the last three decades, Tanzania has undergone economic transition aimed at promoting a market-driven economy. Accordingly, Tanzania's financial-sector reforms commenced in the early 1990s to encourage private players to enter the financial sector, which increased the competition in banking, as well as the number and types of formal and informal financial institutions (FinScope, 2013). The government is therefore no longer required to play a major role in determining credit flows through a system of subsidies, interest rate ceilings, credit allocation and direct intervention. According to Finscope's survey, over 5.4 million people in Tanzania use informal financial services, largely to obtain loans. Most people prefer loans from informal sources due to a lack of the required collateral and a fear of failure to repay. This trend provides a good basis for the analysis conducted in our paper.

This paper makes a number of contributions to the academic literature. First, it uses a unique and distinctive dataset in a developing-economy context, with a particular focus on informal lending. The context of our study is interesting due to the high collateral requirements in developing countries (resulting from a high degree of information asymmetry), accompanied by borrowers' relative inability to provide collateral. Although the assumption concerning the use of collateral is that, in the event of non-repayment of a loan, the lender can seize the collateral, limited wealth, limited property rights and poorly functioning legal systems reduce the lenders' ability to repossess collateralizable assets from large segments of the population in many developing countries. The second contribution is that we break physical collateral down into movable and immovable assets and establish their relationships with delinquency and loan repayment. In many cases, land security is preferred by banks, and therefore less importance has been given to assessing the role of movable assets in enforcing loan contracts. The third contribution is that we assess the extent to which social collateral (guarantorship and relationship lending) reduces the probability of delinquency and increases the loan repayment rate when physical collateral is not pledged. This helps us uncover more innovative ways of collateralizing loans that may be adopted by lenders.

The remainder of the paper is structured as follows. The next section presents a review of the theoretical and empirical work. This is followed by a description of the

methodology applied in this paper. The findings from the field are then presented, analyzed, and discussed. Finally, we present the conclusions, implications and suggestions for future research.

Review of theoretical and empirical work

Collateral is one of the most widely used contractual devices in debt contracts. Economic theory describes collateral either as an attempt to compensate for ex-ante asymmetric information or as a method for reducing ex-post incentive problems. Essentially, the literature argues that collateral arises from the information gap between borrowers and lenders (Stiglitz & Weiss, 1981). It asserts that collateral is either used as an ex-ante commitment to ensure against agency risk, or for hedging against ex-post default risk. According to the *ex-post theory of collateral*, borrowers have to provide collateral as a buffer against the default risk, which arises from moral hazard, difficulties in enforcing contracts or costly monitoring. This strand of theory encourages the use of collateral as part of an optimal debt contract by invoking ex-post frictions and predicts that observably riskier borrowers are more likely to be required to pledge collateral. The ex-post theorists assert that the incidence of collateral is higher for observably riskier borrowers and that collateral provides lenders with an incentive to monitor these borrowers (Berger, Frame, & Ioannidou, 2011).

The *ex-ante theory of collateral* argues that collateral may be used as a sorting or signaling device as it induces observationally equivalent loan applicants to reveal their default risk. This set of theoretical models explains that collateral arising from the ex-ante information gap between borrowers and lenders can lead to an equilibrium characterized by adverse selection and credit rationing in the spirit of Stiglitz and Weiss (1981). Accordingly, the incidence of collateral is expected to increase with the ex-ante information gap between the borrower and lender (Berger, Espinosa-Vega, Frame, & Miller, 2011). A special aspect of this information asymmetry has been addressed in the lender-based theory of collateral, which states that the type of lender matters for information asymmetry and collateral requirements. A model of competition between a local lender with an information advantage and distant transaction lenders predicts that the incidence of collateral increases if the information advantage of the local lenders is reduced, for example in credit scoring.

From the theoretical perspective and according to conventional lending wisdom, it can be argued that collateral is required when borrowers are considered to be relatively less creditworthy. However, the main problem is that the ex-ante and ex-post effects are difficult to separate because both the borrowers' quality and actions are unobserved by the lender. This therefore suggests that, if the market for loans is dominated by asymmetric information, the appeal to collateral may not increase the amount of lending to less creditworthy borrowers (Besanko & Thakor, 1987). Because borrowers have better information about their ability to repay loans than the lender, they may wish to pledge more collateral as a signal to financers that they are a good credit risk. Without collateral, lenders would have to charge higher interest rates or ration credit as a means of increasing the likelihood of repayment.

Consequently, according to the relationship lending perspective, ex-ante and ex-post information asymmetry between the borrower and lender depends on the

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strength (length, breadth or intensity) of the lending relationship, because the proximity of the lender to the borrower facilitates ex-ante screening and ex-post monitoring (Boot, 2000). In a repeated lending model, Boot and Thakor (1994) show that a lender initially requires high collateral from a firm, but reduces these requirements after having observed timely repayment of the loan. The strength of the lender-borrower relationship, measured by its length or breadth, or whether the lender is the borrower's main or only lender, may be viewed as an inverse proxy for the degree of asymmetric information. This is because the lender gathers additional information on the borrower as the relationship becomes stronger (Degryse & Van Cayseele, 2000). This argument is relevant in informal lending when lenders reduce their collateral requirements if they have a reference from an existing client and/or when carrying out several transactions with the client. In some cases, informal lenders offer uncollateralized loans based on their experience and relationship with a client. While this approach has the potential to increase access to finance and address the challenge of collateral, its effectiveness has not been tested in an environment in which there is a high degree of information asymmetry.

Despite the theoretical development, empirical work on collateral has been scarce for a long time. It is, however, encouraging to observe that, during the past few years, this research domain has started to gain the attention of researchers, largely from the West and Asia. Generally, the empirical research in this domain can be sub-divided into two research strands. Within the first strand, collateral is studied as a tool for reducing the information asymmetry between the borrower and the lender, which is the foundation for the existence of credit rationing. This research provides *indirect* evidence of the relationship between collateral and credit rationing. Within the second strand, collateral is studied as one element in a demand-supply lending model, with credit rationing arising when the demand for bank loans exceeds the supply. Collateral availability increases the supply of loans and thus reduces the probability of credit rationing. In terms of testing theoretical perspectives, empirical studies have mainly been informed by the ex-ante and ex-post theories, and recently by the relationship lending and social collateral perspectives. Equally, the studies reviewed in this paper are informed by the key perspectives of collateral.

For instance, based on the ex-ante theory of collateral, Kislat, Menkhoff, and Neuberger (2013) found that formal lenders rely on collateral about 40% more often than informal lenders. In addition, formal lenders rely less on collateral where there is a longer borrower relationship and informal lenders rely less on collateral when they are closer to the borrower. Likewise, the cross-sectional study of 43 developing countries by Nguyen and Qian (2012) established that loans from non-bank financial institutions were less often collateralized, due to the closeness of the institutions to the borrowers. Berger, Espinosa-Vega et al. (2011) exploited exogenous variations in ex-ante lender information relating to the adoption of an information-enhancing loan underwriting technology and found a negative effect on the use of collateral, consistent with the ex-ante theory of collateral. Loannidou and Ongena (2010) found that switching to a new financer increased the likelihood of collateralization. This supports the ex-ante theories of collateral, because ex-ante information asymmetry is greater for an outside financer than for relationship lenders. In a cross-sectional study of 31 countries, Godlewski and

Weill (2011) showed that, consistent with the ex-ante theories of collateral, the relationship between collateral and risk premiums tended to be negative in countries with higher levels of asymmetric information.

Consistent with the ex-post theories, studies have found that observably riskier borrowers are more likely to pledge collateral. For instance, Brick and Palia (2007) found a positive association between financial leverage and collateral. In line with this, several studies have found a positive association between collateral and past observed repayment problems (Harhoff & Körting, 1998; Jimenez, Salas, & Saurina, 2006). There is also evidence that collateral plays a disciplinary role in the behavior of the borrower, solving the moral hazard problem (e.g., Chakraborty & Hu, 2006). Consistently, it has been found that ex-post non-performance of loans is positively related to collateral (Berger, Frame et al., 2011). Surprisingly, in some studies no significant relationship has been found between collateral and loan risk premiums for loans drawn under commitment (Berger & Udell, 1990). Notably, Jiménez, Salas, and Saurina, (2006) directly tested the adverse selection and moral hazard hypotheses by separating ex-ante and ex-post measures of borrower riskiness, namely defaults prior to and after origination of the loan. Their results suggest that, although observed riskiness increases the likelihood of collateral being used, there is also a negative association between collateral and default after the loan has been granted, which is consistent with the adverse selection argument.

More recently, some studies have looked at guarantorship and relationship lending as substitutes for physical collateral. For example, based on a survey of 2,186 rural households in Thailand, Menkhoff, Neuberger, and Rungruxsirivorn (2012) found that lenders provided collateral-free loans through third-party guarantees, which are an important substitute for collateral as they reduce collateral requirements independently of relationship lending and so are often used by financial institutions. Using a sample of over 50,000 individual lines of credit granted by Italian banks, Pozzolo and Elinaudi (2014) found that real guarantees (physical assets or equity that the lender can sell if the borrower defaults) are mainly used to give priority to some creditors. Personal guarantees (contractual obligations of third parties to make payments in case of default) are used to overcome moral hazard problems. Controlling for borrowers' characteristics, both real and personal guarantees reduce ex-ante credit risk. In our paper, we are more interested in the personal guarantee that is, to put it simply, not based on real assets. This reflects the guarantorship practices of most informal lenders.

With respect to referrals and relationship lending, Fiordelisi, Monferrà, and Sampagnaro (2014) used matched data for 43,000 firms and their lending institutions between 2008 and 2010 and found that the probability of a firm becoming distressed decreased when the duration of the lender-firm relationship was long. Although most studies on relationship lending have been conducted in mature economies, it is clear that this kind of lending plays an even larger role in less developed economies, where financial systems are characterized by a lack of transparency and weak legal enforcement. Especially in the case of small loans in markets that are not fully developed, the cost of evaluating and utilizing collateral may be excessive, which makes relationship lending especially attractive as a substitute for collateral. We therefore expect the duration of the lending relationship to have a negative influence on the collateral required in a developing economy.

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Overall, both the theoretical and the empirical literature support the use of collateral for reducing the adverse selection and moral hazard problems. However, its use remains a problem in terms of the information asymmetry that lenders confront (the fear of selecting non-creditworthy clients) and the moral hazard problem (as clients change their minds about loan use later) (Nissanke & Aryeetey, 1996). Much of the literature has focused on developed financial markets and formal financial institutions, but there is little empirical work based in Africa focusing on informal financing models. Therefore, due to the informality of the financial sector in Africa (Puri, Rocholl, & Steffen, 2011), an analysis of the use of collateral in informal financing would benefit the existing literature. In addition, to a large extent, the literature on informal financing in Africa (e.g., Aryeetey, 1998; Besley, 1994) focuses on group lending, which puts emphasis on joint liability. While these models have proved fairly successful in increasing financial inclusion (Aryeetey, 1998), collateralization of individual loans in informal lending is not documented in the existing literature. Although the existence of formal and informal credit markets in Africa is recognized, collateral security is often beyond the reach of most informal borrowers (Besley, 1994). At the same time, the ability of the lender to foreclose is often limited, making enforcement of loan repayment difficult. Such difficulties help to explain the use of the informal financial market, which uses models such as group lending to ensure enforcement.

In Tanzania, there are some practical issues relating to the collateralization of individual loans that need to be taken into account. First, the challenges regarding information asymmetry and the difficulty of enforcing contracts and following them up make it difficult for informal lenders to use traditional collateral (e.g., registered land). Informality of land ownership and a lack of identification systems make the situation even worse. Second, as Puri et al. (2011) put it, it is very difficult to confiscate collateral without proper ownership documentation and in the presence of malfunctioning legal systems. As a result, many financial institutions are increasingly emphasizing non-tangible aspects of creditworthiness (character, repayment history, etc.) to reduce the likelihood of poor credit judgments and the resulting need for intensive collection efforts. This therefore explains why informal lenders include guarantorship in the loan assessment process and put a lot of emphasis on referrals by clients. Taking into account the complexity of using registered collateral in informal lending, we include other types of collateral in our analysis. This article goes beyond the existing literature by taking into account loan repayment and delinquency as dependent variables, which are more specific than the general moral hazards (post-loan actions), referred to in most studies.

Models and variables

We use two models to estimate repayment and the risk of clients. Model 1 uses **repayment** as the dependent variable, measured as a binary variable equal to 1 if the customer has (at the time of data collection) paid all the loan instalment(s) due and there was no any delays in repayment, and 0 otherwise. The literature shows that loan repayment is one the most important aspects when examining the performance of a financial institution (Nawai & Shariff, 2010). This implies that the ability of customers to repay their loans (both principal and interest) on time has a positive effect on the

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lender's success. In this case, this study focuses on loans that were paid on time and according to the repayment plan given to clients. However, it should not be construed that all the loans that had not been paid back at the time of the interview were non-performing. Based on the most widely known definition of non-performing loans, developed by the International Monetary Fund (IMF) in the framework of the Financial Soundness Indicators, loans should be classified as non-performing if the payment of the principal and interest is overdue by three months (90 days) or more, or payment has been delayed by arrangement. This brings the second model '**delinquency**' which is measured as a binary variable equal to 1 if the customer has (at the time of data collection) had delayed repayment, and 0 otherwise (Srinivasan, 2007). In measuring delinquency, we were guided by the classic model of Rosenberg (1999), which covers significant ground in the measurement of delinquency in microfinance institutions (MFIs). According to Rosenberg, the on-time collection rate provides immediate feedback on the timeliness of loan repayment. The main difference between these two dependent variables is that loan repayment is measured on the basis of the loan repaid on time as per planned scheduled while delinquency was measured based on the non-performing and impairing for at least 90 days.

The independent variables for this study are immovable assets (land titles and certificates), movable assets, guarantor and referral. **Immovable assets** are measured as a binary variable equal to 1 if the customer offered physical collateral in the form of a land title deed or land certificate, and 0 otherwise. Due to the lack of a secure title in the case of most clients of informal financial institutions in developing countries (De Soto, 2000), we analyze the use of immovable assets as an alternative or substitute for movable assets. In line with Chalamwong and Feder's (1986) view, the use of a land title is not nearly so important in the informal credit market as in the formal one, and therefore consideration of both land and movable assets expands the scope of assets used in informal lending. **Movable assets** is measured as a binary variable equal to 1 if the customer offered any type of movable asset such as, motor vehicles or motorcycles, and 0 otherwise. **Guarantor** is measured as a binary variable equal to 1 if the customer had someone who guaranteed his/her loan and 0 otherwise. As Berger and Udell (2000) pointed out, guarantees typically operate like collateral, except that they do not give control over specific assets. This means that, when physical collateral (movable or immovable) cannot be provided by the borrower, guarantorship may be used to cover the loan. **Referral** is measured as a binary variable equal to 1 if the customer was referred to the institution by another customer or a friend and 0 if the customer discovered the institution in another way (media, signboards, etc.). Because the issue of relying on referrals to recruit clients is not adequately addressed in the literature, and as it is commonly used by lenders when screening clients, this variable was considered relevant. The assumption is that a client referred by a well-performing existing client is likely to also be a good client.

We also use two control variables. Since the literature shows that women are better at repaying than men (D'Espallier, Guerin, & Mersland, 2011; Karakire Guma, 2015), we control for **gender**, measuring it as a binary variable equal to 1 if the customer is female and 0 if male. Married customers are argued to be likely to repay faster than unmarried ones because of the support they have from their spouses (ibid). We therefore control for **marriage**, measured as a binary variable equal to 1 if the customer is married and 0 otherwise. Customers take loans for various purposes. We include loan

use as one of the variables and define it as a binary variable equal to 1 if the customer took a loan for business purpose (starting, expansion, financing tenders and emergencies in business) and 0 if the loan was taken for personal uses (personal emergencies, family needs and school fees). The models are specified as follows:

Model A: Repayment = f (immovable assets; movable assets; guarantor; referral; control variables)

Model B: Delinquency = f (immovable assets; movable assets; guarantor; referral; control variables)

Sample and data collection

Our sample consists of 835 individual borrowers of an informal lending institution in Tanzania. The company was incorporated in 2010 to provide financial services to enterprises and individuals in Dar es Salaam and Arusha, the most important commercial cities in the country. Although the company is registered and has all the necessary licenses, it does not accept deposits and savings from clients, and is not regulated by the central bank. The company was established to meet the growing need for financial services among entrepreneurs and individuals wishing to obtain capital to grow their businesses and/or meet urgent personal needs. The company largely relies on the relationship-lending approach, with an emphasis on the character and reliability of the client, information about which is gathered from various sources, such as peers, personal guarantors and references, so as to enable the client to obtain a loan quickly without the interrogation that normally happens with traditional lenders. The company offers loans ranging from $50 to $15,000 depending on the collateral offered, the character of the client, the ability of the client to repay the loan and their relationship with the company. In some cases, loans may exceed $15,000 for special clients with a close relationship with the company.

Although the company has over 2000 clients, we collected usable data from a sample of 835 based on a simple random table. The data were captured during a period of 2012 to 2014 by the company staff through loan application forms which had semi-structured questions that asked for a number of variables concerning the demographic background of the client, what the loan was used for, the collateral offered, any guarantorships and referrals. While these data were collected in the course of the loan application, the loan repayment performance of each client was measured using the company's records, after the closure of the loan contract. However, we considered the loans which were supposed to end three months before end of December 2014 in order to have at least 90 days required to assess loan delinquency after expiry of the loan repayment period. This also enabled us to avoid inclusion of the loans that would mature after the period of the study.

We recognize the limitation of our method of collecting information from a sample drawn from one institution, which may introduce bias. However, since our unit of analysis was the individual client, and over 70% of the clients studied had loans with other institutions, we considered the sample to be representative of clients of informal financing. In addition, the sample size was large enough to reduce the bias in the results.

We analyzed the data in two stages. First we carried out descriptive analysis, including summary statistics for all variables in the study. The summary statistics (Table 1) help

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show the nature of the variables in the study. Second, we conducted cross tabulations to find out the reasons for loans taken with respect to the type of collateral pledged and the amount of the loan taken (Tables 2 and 3). Next, we performed Pearson's correlation analysis for all variables (Table 4). The second stage was econometric analysis. Here, because of the nature of the variables in the study, we used logit regression (Hair, Black, Babin, Anderson, & Tatham, 2008) whereby all independent variables were tested in relation to each dependent variable (Table 5). The logit model (logistic regression) fits on this analysis because all the dependent variables are categorical.

Descriptive results

Summary statistics

Table 1 indicates that only 44% of clients had repaid all their loans at the time of data collection. While a large amount of money was still unpaid, this does not necessarily mean that the loans were non-performing based on the accepted measures of a non-performing loan (e.g., IMF guidelines shown in Dreher, 2006). Essentially, based on data obtained from the company's loan portfolio, only 10% of the loans were classified as non-performing. The delinquency rate was observed to be 20%, meaning that only about one fifth of the clients had delayed paying their loan instalments by 1–90 days. This is because the company calculates its portfolio at risk (PAR) based on 90 days instead of the 30 days used by most generic MFIs (Field & Pande, 2008). Since the range used by the company is within the accepted international standard, tolerance of delay could be considered a way of attracting clients if the loan repayment is ultimately enforced. This is in line with the literature suggesting that less frequent repayments increase neither the default nor the delinquency rate (Fischer & Ghatak, 2010). In terms of the independent variables, it can be seen that only 7% of the customers had pledged immovable assets, mainly land certificates and title deeds, as collateral for their loans. On the other hand, 86% had pledged movable assets such as motor vehicles and motorcycles as collateral for the loans requested. We also observe that 98% of the customers had guarantors for their loans in case they were unable to repay. This is consistent with other studies (e.g., Menkhoff et al., 2012), which show that lenders often enforce collateral-free loans through third-party guarantees. In terms of referrals, the findings show that 29% (nearly a third) of the customers had been referred to the

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Table 1. Summary Statistics.

	Mean	Std. Dev.	Obs.
Dependent Variables			
Repayment	0.44	0.49	835
Delinquency	0.20	0.40	835
Independent Variables			
Immovable assets	0.07	0.26	835
Movable assets	0.86	0.34	835
Guarantor	0.98	0.11	835
Referral	0.29	0.45	835
Gender (women)	0.27	0.45	835
Married	0.81	0.39	835
Loan Use (Business)	0.59	0.49	835

company by another client or a friend who knew the company, demonstrating the presence of what we refer to as social collateral.

Surprisingly, only 27% of the clients were women. This is contrary to the existing literature on microfinance, which shows that over 70% of MFI clients are women (Cull, Demirgüc-Kunt, & Morduch, 2007; Daley-Harris, 2007). This may be explained by the fact that, while the typical microfinance models in Africa entail group lending (Aryeetey, 1998), and attract a significant number of women (Cull et al., 2007), our data were obtained from a company with a greater average loan size than that of the typical MFI and it was offering loans to individual employees and business people. Since there have been a number of government programs promoting access to finance for women in Tanzania (Mori, 2014), perhaps most women would not wish to borrow from a private company that requires the pledging of collateral as loan security. The results also show that 81% of the customers were married. This is consistent with the aforementioned study by Kato and Kratzer (2013), which found that over 75% of the clients of MFIs in Tanzania were married.

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Uses of loan

In assessing the uses of loans taken, we firstly established the linkages between the use of the loan and collateral pledged. Table 2 presents results of cross tabulations between these variables. Results show that most customers taking personal loans pledge movable assets compared to those with business loans. The difference is not relatively big though it implies that there are linkages between the nature of the assets and the reason for loans. Customers with business loans prefer to pledge immovable assets as collateral since they believe that the business should repay the loan. It is also likely that the immovable assets are pledged from the business assets owned by the enterprise.

Table 3 further compares loan uses with the amount taken by the customer. As presented earlier, the loans range between $50 and $15,000, with few exceptions that go above the highest limit. Results on Table 3 show that the majority of customers took loans for business uses. The ones taking smaller loan amounts ($50 to $250) use them

Table 2. Loan Uses versus Collateral Pledged.

Loan Use	Immovable Assets (%)	Movable Assets (%)
Personal Uses	12.32	87.68
Business Uses	14.57	85.43

Note: Cross tabulation between loan uses and the type of collateral that customers pledge.

Table 3. Loan Amount Versus Loan Uses.

		Loan Use	
Loan Amount (Range in $)	Percentages	Personal Use	Business Use
50 – 250	22.75	54.74	45.26
251 – 500	22.99	47.92	52.08
501 – 2500	43.23	39.89	60.11
2501 – 5000	7.31	21.31	78.69
5001 – 15000	3.59	20.00	80.00
Above 15,000	0.12	0.00	100.00

Note: Cross tabulation between loan amount and loan uses

to meet personal and family needs. As loan amount increases, the differences between those who spend money in businesses and those who spend it for personal needs increases.

Correlation results

Table 4 shows the correlations between the variables. Looking at the correlation between the dependent variables, there is no association between repayment and delinquency (coefficient −0.03). This implies that these variables are not related and therefore can be used as dependent variables. The correlation between the independent variables is weak, showing significant results for the association between movable assets and immovable assets (coefficient −0.60 p>0.001), guarantor and movable assets (coefficient 0.18 p>0.001) and gender and referral (coefficient −0.06 p>0.10). These results suggest that there is not much of a multicollinearity problem among the independent variables since they do not relate to each other (Hair et al., 2008). To verify this, we calculated variance inflation factors (VIFs), which test for a multicollinearity problem among independent variables. Kennedy (2008) holds that correlations need to be above 0.7 to indicate multicollinearity between two variables. Although none of the coefficients is high, significant coefficients are a warning sign that multicollinearity problems may arise. The VIF results, shown in Table 3, range between 1.01 and 1.96, suggesting that multicollinearity is not a problem.

The results of the correlation analysis on the independent and dependent variables show preliminary support for our hypothesis. The positive correlation between immovable assets and delinquency (coefficient 0.007 p>0.05) implies that immovable assets do not matter much in terms of reducing delinquency. To support our hypothesis, we found that movable assets were negatively correlated with delinquency (coefficient −0.09 p>0.001), implying that, when customers pledge movable assets as collateral, they tend to repay on time (no delinquency). As in the t-test results, referral is negatively associated with delinquency (coefficient −0.08 p>0.001), meaning that referees have a positive effect in ensuring customers pay on time. The other variables are not significantly associated with each other.

Table 4. Correlation Analysis.

		1	2	3	4	5	6	7	8	VIF
1	**Repayment**	1.00								
2	**Delinquency**	−0.03	1.00							
3	**Immovable assets**	0.05	0.07**	1.00						**1.96**
4	**Movable assets**	−0.05	−0.09***	−0.60***	1.00					**1.96**
5	**Guarantor**	−0.02	−0.03	0.03	0.18***	1.00				**1.01**
6	**Referral**	−0.03	−0.08***	−0.05	0.05	0.02	1.00			**1.03**
7	**Gender**	0.07**	0.02	−0.01	0.01	0.02	−0.06*	1.00		**1.03**
8	**Married**	−0.02	−0.03	0.01	−0.01	0.01	0.04	−0.16***	1.00	**1.01**

Significance levels: * >0.10; ** >0.05; ***>0.001

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Econometric results

Table 5 provides the findings from the logit regression. With regard to repayment, the results (Model 1) show that, while immovable assets increase the repayment rate (coefficient 0.27 $p<0.10$), movable assets have a similar effect on the repayment rate (coefficient 0.22 $p<0.10$). Our results are in line with the generic banking and microfinance literature, which suggests that physical collateral, helps speed up the repayment rate (Mookherjee & Ray, 2002). Model A provides no evidence of a positive association between guarantors and referrals on the one hand, and the repayment rate on the other.

Unexpectedly, Model B provides results showing that immovable assets are associated with a high delinquency rate (coefficient 0.34 $p<0.05$). This implies that, while immovable assets facilitate the repayment of a loan, customers may still delay repayment having pledged such assets. One explanation to this could be because borrowers know that even if they delay repaying their loans, it takes more time and involves a protracted procedure for a company to sell immovable assets and recover its money. These results are also supported by Berger and Udell (1990), who found that borrowers who put their immovable collateral in banks as security for loans are associated with high delinquency. Leitner (2006) further argues that when the loan is protected by collateral, especially the immovable collateral, the lenders' incentive to exert effort in evaluating loans can be reduced because they know that they can recoup the value of the loan by seizing the collateral. This can lead to the lender deciding to give a loan to a bad client who is likely to delay repayments.

On the other hand, movable assets are negatively associated with the delinquency rate (coefficient –0.33 $p<0.001$). This means that customers avoid delaying the repayment of a loan when they have pledged movable assets, as they know that it takes less time for them to be confiscated. The effects of both movable and immovable assets on delinquency are also seen in in the correlation results (Table 4). The findings are contrary to those in the banking literature, which show a greater preference for land as security than immovable assets (Nguyen & Qian, 2012).

From the lender-based theoretical perspective, the greater acceptance of movable assets by informal lenders implies that companies try to reduce the ex-ante information gap between themselves (lenders) and borrowers (Berger, Espinosa-Vega et al., 2011).

Table 5. Logit Regression.

	Model 1	Model 2
	Repayment	Delinquency
Independent Variables		
Immovable assets	0.27*	0.34**
Movable assets	0.20*	–0.33***
Guarantor	0.07	–0.02
Referral	–0.05	–0.26***
Control Variables		
Gender	0.20**	–0.04
Married	–0.01	–0.08
Pseudo R^2	0.08	0.10
Observations	835	835

Significance levels: * >0.10; ** >0.05; ***>0.001

Note: Logit regression showing the dependent variables Repayment (Model 1) and Delinquency (model 2) regressed with independent and control variables.

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This might be because the lender has spent time gathering information about the borrower, which has enabled a relationship to be built between the two. This relationship is further shown in Model 2 in regards the effect of referral on delinquency (coefficient –0.26 $p<0.001$). This means that customers who were referred to the company by other customers or friends are unwilling to delay their payments. It is further evidence of relationship lending and social collateral from which both lenders and borrowers benefit. In terms of the control variables, we found that women had a higher repayment rate than men (coefficient 0.20 $p<0.05$). This result is in line with the microfinance literature, which shows that women are better at repaying than men. In summary, our results show that movable assets and social collateral matter in terms of the repayment performance of customers.

Discussion

In general, the results presented in this paper are interesting and add value to the existing finance literature. From both the descriptive and econometric results, it is apparent that only a small proportion of clients offer immovable assets as collateral. The findings are not surprising in the context of a developing economy where there are two complementary (formal and informal) financial markets operating together (Besley, 1994). In the presence of such a system, it is more likely that borrowers will pledge their immovable assets (land security) to banks to secure larger loans, as banks mostly only accept land titles as security. It also reflects the fact that, in most Sub-Saharan countries, most of the land is owned informally and therefore cannot be used as collateral (Atogenzoya et al., 2014). This means that, while it is advantageous to use land as collateral because it cannot be removed and does not easily lose its value, many borrowers face credit barriers due to the lack of formally documented ownership rights. In line with Puri et al. (2011), confiscating and disposing of the land pledged as collateral when a client defaults is very complex, discouraging both borrowers and clients from using land as collateral. Even when the borrower has a clear title and is the sole owner of the property, the process of transferring the title (assignment) affects the time and money involved in the finalization of a mortgage and consequently access to finance (Atogenzoya et al., 2014). Tanzania's experience indicates that the process of using land security as collateral takes a lot of time and involves high fees in addition to the cost of valuation, which delays the completion of the loan application process. Because of the difficulties involved in land valuation, in gaining control of collateral and in selling it once control is gained, most informal lenders are likely to opt for movable assets. This therefore implies that using movable assets as collateral may increase access to finance for small enterprises and individuals that cannot obtain mortgaged loans from banks.

Another interesting observation from the descriptive results is that the majority of the clients had guarantors. While this appears to be a positive aspect in terms of social collateral, it is important to underscore that personal guarantees offered for clients are not associated with a third party's obligation (collateral). That is, although loan contracts state that the guarantors will be responsible for facilitating the recovery of the loan if necessary, no guarantor pledges his/her collateral as part of the loan.[4] Consistent with Pozzolo and Elinaudi (2014), the lack of commitment by a third party means that

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the moral hazard problem is unlikely to be overcome. The findings therefore challenge the notion of the use of a personal guarantor as collateral, especially when the guarantor does not pledge any real assets. This is in line with Berger and Udell's (2000) view that personal warranties (guarantees) are effective only if they act as contractual obligations of third parties to make payments if the borrower defaults. Therefore, guarantees typically operate like external collateral, although they do not give control over specific assets but represent a generic claim on the entire wealth of the guarantor, who thus has a large degree of freedom, and may simply neglect the claim. Nevertheless, the use of guarantees, whether real or personal, may reduce ex-ante credit risk in the sense that guaranteed clients are likely to have good reputations, which is important for reducing the adverse selection risk. These findings emphasize the importance of personal guarantees in less developed markets, largely as a means to overcome information and incentive problems, rather than to increase the loan repayment rate.

In addition, relying on referrals from clients seems to have an effect in terms of reducing delinquency. This is evident in both the descriptive and econometric results. These results imply that referrals help to reveal the borrower's quality and future actions, on the assumption that referred clients are well known by their referees. It can also help to reduce the problems of adverse selection and moral hazards, as postulated by Stiglitz and Weiss (1981). This complements the concept of relationship lending, which argues that loan performance is improved when the customer is known to the company (Egli, Ongena, & Smith, 2006).

Our econometric results further demonstrate that, while the loan repayment rate was high when immovable collateral had been pledged, the loan delinquency rate was relatively low in such cases. This is perhaps because clients put a lot of weight on the value of their land, especially when they have legal right of ownership. However, as alluded to before, most clients are aware of the complexity involved in confiscating and disposing of land, and therefore may delay repaying loans backed by such collateral, even though they will eventually repay them. Due to enforcement problems, lenders may not be able to seize assets immediately when there is a delay, although in the long run, upon default, the land will be seized (Mookherjee & Ray, 2002). In some cases, when a borrower fails to repay a loan completely, family members are likely to repay it, given that land is regarded as family land. Therefore, most lenders understand that, even if repayments are delayed on a loan collateralized with land, it will ultimately be repaid, which may increase the degree of delinquency while increasing the loan repayment rate. From these findings it can be concluded that, even though pledging land as collateral is associated with a high rate of delinquency, it is still stronger collateral than movable assets in terms of loan repayment. In either case, it appears that physical collateral continues to serve the purpose it has always served, which is to increase the likelihood of repayment. This is in line with the view that collateral plays a disciplinary role in the behavior of the borrower, solving the moral hazard problem (Menkhoff et al., 2012).

Conclusion and implications

This paper focuses on whether different forms of collateral accepted by informal lenders are effective enough to ensure loan repayment and reduce the delinquency rate. Guided by the theoretical stance that collateral is used by lenders either as an attempt to

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compensate for ex-ante asymmetric information or as a method for reducing ex-post incentive problems, our empirical results support the view that collateral generally serves to increase the likelihood that borrowers perceived as less creditworthy will obtain loans from informal sources and repay them. While pledging immovable assets as collateral has a positive effect on loan repayment, it is associated with a high delinquency rate. Our results further indicate that pledging *movable* assets both increases the loan repayment rate and *reduces* the delinquency rate. This implies that the acceptance of movable assets may help lenders to reduce the ex-ante information gap between them and the borrowers (Berger, Espinosa-Vega et al., 2011).

In addition, the effect of guarantorship was not found to be significant, despite the fact that most of the customers in our dataset had guarantors. Notwithstanding the fact that guarantors do not provide the benefits of increasing the repayment rate and reducing the delinquency rate, they do play a critical role in building lenders' confidence in their customers. In view of this, the use of guarantees may reduce ex-ante credit risk and the problem of adverse selection. Further, we found that customer referrals matter when it comes to both repayment and delinquency. This is evidence of one way in which relationship lending and social collateral can benefit both lenders and borrowers. Based on the results presented in this article, it is feasible to break collateral into specific forms (immovable, movable, guarantorship and referrals) and to test each one's effects on loan repayment. This extends the concept of collateral in the developing-economy context, which has to date largely been confined to land security. Our results imply that the challenges of ex-ante selection and ex-post action can be reduced in lending by the consideration of both physical and social collateral. This contributes to both theoretical and methodological advancement in the analysis of the use of collateral, by highlighting the informal lending aspect, the effect of specific types of collateral on loan performance, and the developing-country context. More importantly, we have been able to demonstrate how both movable assets and social collateral function in the context of an informal lending institution to enforce loan repayment. This indicates that contrary to previous practice where most financers in the developing economies rely on land as collateral, they can enforce loan repayment through non-traditional collateral. Accordingly, our study advocates for the financial policy, which encourages the idea of enlarging the 'collateral menus' by including immovable assets and social collateral in the collateral accepted by financers as a way of deepening financial inclusion. This is in line with research findings from other contexts (e.g., Campello and Larrain, 2016), which recommend the inclusion of movable assets into collateral menus. Drawing on the experience demonstrated in this study, governments in developing countries and Tanzania in particular are encouraged to reform the financial sector by enacting policies and laws recognizing informal financiers and the innovative ways they use to collateralize their loan products.

Nevertheless, our article is limited by the use of cross-sectional data from a single institution in one country. Also, our analysis is not exhaustive in terms of the factors that affect delinquency and loan repayment in informal lending. On the basis of this, comparative studies in other African countries are recommended. It would also be interesting to study other factors contributing to adverse selection and moral hazard problems, especially in the context of informal lending. Since the concept of social collateral has not received adequate consideration in the academic literature, further analysis of the concept would benefit the field of finance.

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Notes

1. Informal finance is a broad concept that encompasses a wide range of financial activities and services that take place beyond the scope of a country's formalized financial institutions and lie outside financial sector regulations (FinScope, 2013). In our case, informal finance is used to mean services offered by institutions offering select banking services but not recognized as official banks, as well as services offered at the ad hoc level with no formal financial sector regulation. In particular, we focus on a legally registered institution that comes under no objections from the central bank simply because it is not regulated by the banking regulations.
2. Adequate collateral implies physical assets or equity that the lender can sell if the borrower defaults (Pozzolo & Elinaudi, 2014).
3. The context in which social collateral is used in this paper refers to third-party personal commitments and obligations to facilitate the recovery of the loan (Pozzolo & Elinaudi, 2014).
4. This is according to the credit policy and loan contracts of the company from which the sample was drawn.

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