CREDIT RATIONING AGAINST SMALL AND MEDIUM SCALE ENTERPRISES IN TANZANIA

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FOR REFERENCE ONLY

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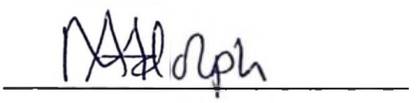
ABSTRACT

The potential of Small and Medium Scale Enterprises (SMEs) in promoting economic growth is widely accepted and documented by scholars and policy makers alike. Limited access to credit for these small and medium scale enterprises (SMEs) has been identified as a major bottleneck in realising this potential. Building on the concept of information asymmetry and transaction costs theories, this study tested the influence of firm and entrepreneur characteristics on bank's credit rationing and the impact of credit rationing on SMEs growth in the Tanzanian setting. A cross sectional survey design was used to collect data from 271 entrepreneurs and 28 credit officers. Descriptive statistics, Analysis of Variances (ANOVA) and binary logistic regression analysis were employed to analyse the study data. The findings reveals that credit rationing of SMEs is explained by firm and entrepreneur characteristics. Specifically, with regard to the entrepreneur characteristics, the findings indicate that young borrowers and entrepreneurs who have had insufficient knowledge about bank requirements, who lack knowledge of preparing business plans, who lack credit history and who are constrained by the cost of preparing business project plan, were more likely to be rationed. On the other hand, entrepreneurs who have had better past relationship with the banks were less likely to be credit rationed. Furthermore, the findings indicate that specific business characteristics, such as firm age, size, industry, geographical distance, poor quality accounting practices and collateral have some influence on credit rationing. The study also reveal that low turnover of bank account, high monitoring costs of SMEs loan and asymmetric valuation of the projects increase bank's credit rationing. The findings reveal further credit rationing affect sales and employment growth. The study recommends that banks should develop training programmes for borrowers about all aspects of the lending transaction and acquire information processing capabilities and lending techniques that overcome asymmetric information. It is also recommended that government should formulate rules on financial

reporting and disclosure. Government should also provide training programs in business plans, income tax assessment and financial management for SMEs owners. It is further recommended that SMEs should show consistent cash flow; in line with the performance of their bank accounts. SMEs also need to keep proper financial statements and develop a culture of transparency and accountability.

DECLARATION

I, **Martha Adolph Maziku**, do hereby declare to the Senate of Sokoine University of Agriculture, that this thesis is my own original work and that it has neither been submitted nor concurrently being submitted in any other institution.



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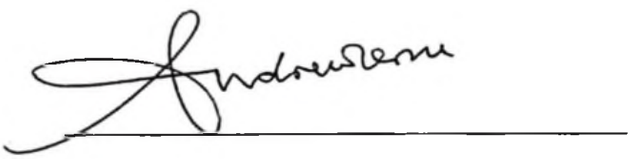

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DEDICATION

Glory be to GOD.

I dedicate this work to my family. They highly encouraged me through their tolerance and earnest prayers during the whole period of my study.

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LIST OF ABBREVIATIONS AND SYMBOLS

AIINDX	Asymmetric information index
ANOVA	Analysis of Variances
ESRF	Economics and Social Research Foundation
GDP	Growth Domestic Product
IFC	International Finance Company
NSGPR	National Strategy for Growth and Poverty Reduction
OAYEC	Ontario Association of Youth Employment Centre
REPOA	Research on Poverty Alleviation
SMEs	Small and Medium-sized Enterprises
TCINDX	Transaction cost index
TRA	Tanzania Revenue Authority
Tshs	Tanzanian Shillings
UK	United Kingdom
UNIDO	United Nations Industrial Development Organization
URT	United Republic of Tanzania
USA	United States of America
χ^2	Chi square

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background information

The potential of small and medium scale enterprises (SMEs) in the promotion of economic growth and poverty alleviation in both developed and developing countries is widely recognised and documented by both scholars and policy makers (Beck *et al.*, 2010). Therefore, enhancement of SMEs performance has been the primary interest of both policy makers and researchers around the world (Beck *et al.*, 2010). This is because these SMEs have had the ability to employ a significant amount of the labour force in their local economies and provide an opportunity for entrepreneurial and business skill development (Tambunan, 2011). SMEs on average make up over 90 percent of enterprises and account for 50 to 60 percent of employment in the developing world (Tamara, 2006).

Despite the importance of the SME sector in economic development, recent data regarding the current status of the sector in Tanzania are not readily available. The available data show that, SMEs contribute 35 percent of the GDP and employ about 20 percent of the labour force (Wangwe, 1999). Additionally, it is estimated that there are approximately 2.7 million enterprises in the country, and about 60 percent of which are located in the urban areas (IFC, 2005). Majority (98 percent) of these SMEs employ less than 5 people (Olomi, 2009). This implies that medium and large enterprises are very few in the economy. Additionally, about 700 000 new entrants are estimated to be entering the labour force every year, and about 500 000 of these new entrants are school leavers with few marketing and entrepreneurial skills (Olomi, 2006). The public sector employs only about 40 000 of the new entrants into the labour market, leaving about 660 000 of them to join the unemployed or the under employed category of people (Olomi, 2006). Many of these

people end up in the SME sector, and especially in the informal sector. Since more than 70 percent of all registered businesses are SMEs (URT, 2009a), it is an undisputable fact that SME sector is still nascent; this is not withstanding the fact that the sector plays a significant role in the economic growth, poverty alleviation and unemployment in the country (URT, 2010). Thus, the promotion of such enterprises in Tanzania is of paramount importance.

Tanzania suffers from high levels of unemployment, poverty and income inequality (URT, 2010). Therefore, the development of SMEs is an important endeavour in addressing these problems. Given the failure of the formal and public sectors in absorbing the growing number of job seekers in Tanzania, the attention has increasingly been on SMEs and their potential for contributing to economic growth and job creation. Consequently, the Government of Tanzania enacted the SMEs development policy (2003-2013) with the aim of fostering job creation and income generation through creation of new SMEs and improving the performance and competitiveness of the existing SMEs. Accordingly, the reduction of extreme poverty, to about a half of its present levels by the year 2015, is one of the major resolutions of world leaders at the United Nations Convention in 2000 (URT, 2010). In this respect, the National Strategy for Growth and Reduction of Poverty II (NSGRP II) has set targets of reducing poverty in both rural and urban areas in Tanzania from 33.6 percent in 2007 to 24 percent in 2015 (URT, 2010). Thus, the development of SMEs is considered to be one of the key strategies of attaining poverty reduction targets (URT, 2010). Moreover the government has initiated a package of strategies, aiming at fostering SMEs development by reducing various problems facing SMEs in marketing, human resource and management, technology, infrastructure, regulations, and financing (URT, 2010).

Despite the role played by SMEs in creating employment and alleviating poverty, as well as the government efforts in developing the sector, there has never been a real take off in terms of upward mobility of micro and small enterprises (Olomi, 2006). There is hardly any micro and small enterprises that grow sustainably and make a transition to large size or even medium size enterprises. As a result, enterprise structures in Tanzania are mostly characterized by a large base of micro and small enterprises (Olomi, 2009). In Sub-Saharan Africa, this phenomenon has been referred to as the "missing middle"- lack of medium-sized enterprises, as SMEs can be categorised as micro, small, and medium-sized firms (UNIDO, 2008)

1.1.1 Problems faced by SMEs

There are many difficulties which constrain the formation and growth of SMEs in Tanzania and other developing countries. According to Olomi (2009) such difficulties include limited capacity of the people who start and operate the businesses, cumbersome regulatory framework, limited access to finance and working premises. Some of these constraints relate to the general policy framework of the government which SMEs have little control (Olomi, 2006, 2009). However, the SMEs could have major influence on them through support, if they (SMEs) had the funds to set up and sustain professional support associations. There are also those constraints that are specific to the SME, and which could be tackled by obtaining the necessary resources from the market if the funds were made available (Satta, 2003, 2006). Limited access to finance among SMEs compounds and intensifies the problems associated with the growth of SME sector (IFC, 2010; Ayyagari *et al.*, 2008).

The financial sector in Tanzania is dominated by banking institutions which account for about 75 percent of the total assets of the financial system (BOT, 2010a). However, access

to the bank finances is limited for Tanzanian SMEs (Olomi, 2009; Finscope, 2009; Richard and Mori, 2012). Beyond the main commercial banks, several micro finance institutions provide financial resources to the SME sector (Finscope, 2009; Richard and Mori, 2012). However, micro financing institutions provide short term financing which is primarily designed to meet the short-term working capital needs of micro enterprises. Furthermore, average loan sizes in the micro finance sector are considerably smaller than is the case with the commercial bank sector (Mori *et al.*, 2009). As a result, most of the SMEs in Tanzania finance their activities using own funds, loans from friends and family, money lenders, relatives, rotating savings and credit groups (Mori *et al.*, 2009). However, the amount of finance that is raised through these methods is limited and insufficient to sustainably finance the growing SMEs (Richard and Mori, 2012). For that reason, limited access to bank finance has always been perceived as one of the critical barriers to SMEs' growth in Tanzania (Olomi, 2009; IFC, 2011, 2012; Richard and Mori, 2012).

According to the available literature, the constraint of access to bank credit is a result of credit rationing behaviour of the banks, which emanates from information asymmetries between finance providers and borrowers (Hashi and Toci, 2010). In the presence of information asymmetry between lenders and borrowers, adverse selection and moral hazard (Jaffee and Russel, 1976; Stiglitz and Weiss, 1981) and fixed loan assessment and monitoring costs (Williamson, 1987; Storey, 1994a) can lead to credit rationing. Thus, firms are unable to obtain all the credit they need at the existing market interest rate.

The problem of asymmetric information is more likely to occur when banks deal with SMEs; this is because it is particularly difficult for SMEs to convince the banks about the quality of their (SMEs') business plans or understand the inner workings of an SME, also known as its informational opacity (Berger *et al.*, 2011a). The banks often lack a track

record that indicates the quality of these SMEs; this is beside the fact that they (SMEs) are also less transparent and often have less collateral that could protect creditors (Beck *et al.*, 2011a). From the bank's point of view, the costs involved in assessing and monitoring SMEs act as a disincentive to funding this sector (OECD, 2006)

Considering the importance of SMEs in promoting economic growth in Tanzania and the above argument that supports the notion that SMEs do not have access to adequate finance to support their operations, the existence of credit rationing in the financing of SMEs is a phenomenon that cannot be taken for granted (Zambaldi *et al.*, 2011). If firms face credit rationing they may be unable to invest, despite their willingness to do so, unless internal sources of finance are made available (Hashi and Toci, 2010). This may lead to a situation where the economy loses some of the potential benefits of potentially good projects that cannot be implemented because of lack of funds (Storey, 1994b). As a result, credit constrained firms may not only miss the opportunities of keeping individual firms from growing, but also if large numbers of firms are constrained, thus their contribution to employment creation and poverty alleviation may be hampered leading to a slow down of economic growth of the country (Levine, 2006).

1.1.2 Bank credit decision and SMEs credit rationing process

According to Lapar and Graham (1988) bank's credit rationing behaviour against the firm's loan demand can be categorized into three stages: the screening stage, the evaluation stage, and the quantity rationing stage. The screening stage occurs at the counter before any loan application form is filled in. This screening is the responsibility of a credit officer who interviews the loan applicants to determine their eligibility for credit. During the interview, the credit officer probes into the applicants' personal and business background, as well as the applicants' loan requirements and the terms which are desired.

The credit officer decides whether the applicant qualifies to apply for a loan. At this stage, some of the applicants, that is, those whom the credit officer thinks are not qualified are rationed.

The subsequent formal rationing is subdivided into two main rationing stages. The first rationing stage is after the screening has taken place, once the loan applications are accepted, processed, and evaluated to determine which among the loan applications will be approved and which will be rejected. If the initial screening process is efficiently carried out by the credit officer, then no applicant will be rejected at this stage. Once the decision is made on credit worthiness, the credit officer decides on how much will be granted to each applicant, that is, the quantity rationing. Hence, the bank fine-tunes the loan contract to reflect the lender's subjective evaluation of the riskiness of the loan and of the borrower and the impact of risk on the bank expected profit.

Generally, the banks determine how much credit is allocated to each applicant based on the available information to evaluate the probability of loan repayment. In the decision-making process of the bank lending, relevant information is mainly of the following categories: First, project industry information, which reflects the operating environment of the project. Second, business information, which include availability of collateral, operating results, cash flows and some other pieces of financial information that reflect the operating conditions of enterprises. Entrepreneur information relates to enterprise operator's character, personal qualities, management abilities, relationship with the bank and some personal information. However, obtaining the aforementioned information can be very costly and can make contracts enforcement difficult as asymmetric flow of information exists between borrowers and the bank, often resulting into credit rationing (Jaffee and Russel, 1976; Stiglitz and Weiss, 1981). In the presence of information

asymmetries, SMEs will face credit rationing because they (SMEs) typically demand smaller loans, they are less transparent and have less collateral to offer (OECD, 2006). Therefore, the bank's credit rationing behaviour may be influenced by a number of factors which include the borrower's observable characteristics, the firm characteristics, and loan characteristics.

Considering the stages of lending behaviour described above and the existence of information asymmetry and fixed transaction costs (assessment and monitoring costs), the bank will outright favour rationing of credit against high risk applicants, rather than lending to all who want it at the market clearing price (Saridakis and Storey, 2009). Credit rationing in this study is premised on the argument that the interest rate charged is not a principal screening device used by the bank to allocate credit. Given that the lending rate is not an effective device to allocate credit; banks use non-interest screening devices based on the characteristics of entrepreneurs and attributes of the enterprises (De Young *et al.*, 2008; Lehmann and Neurberger, 2001).

Thus given that SMEs are responsible for significant levels of employment, income generation and poverty alleviation and credit rationing constrain the development and growth of SMEs, it is important that policymakers and advisers are well informed about the extent of credit rationing, determinants of credit rationing, and the impact of credit rationing on the growth of SMEs. Consequently, research on SMEs credit rationing is required in order to understand the factors that constrain SMEs, at firm level, from accessing adequate bank credit and the impact of credit rationing on SMEs growth.

1.2 Research problem and research gap

SMEs are critical for the economic and social development of developing countries. They play a major role in creating jobs and generating income for low income people; they foster economic growth, social stability, and contribute to the development of a dynamic private sector (IFC, 2012). However, lack of access to credit remains a key constraint to SME development in developing countries (IFC, 2010). According to IFC (2011) about 45 to 55 percent of the formal SMEs in developing countries do not have access to formal institutional loans or overdrafts despite a need for one. The formal SME credit gap in developing countries is estimated at about $800 billion.

Limited access to bank credit is equally critical for SMEs, which are among the main drivers of job creation and poverty alleviation in Tanzania. According to Finscope (2009), banks and other formal financial institutions serve only 12.4 percent of the population, informal and semi formal financial service providers serve about 31.6 percent while 56 percent of the population is still excluded and unreached. A World Bank study also reveals that an estimated 12.1 percent of small enterprises, 25 percent of medium enterprises and 61.8 percent of large enterprises in Tanzania use banks to finance investment and other expenses (World Bank, 2006). Olomi (2009) notes that over 70 percent of SMEs in Tanzania perceive limited access to bank finances as the most serious impediment to the establishment and development of these SMEs, despite the fact that banks in Tanzania do not have liquidity problem. The overall banking sector liquid asset ratio from 2006 to 2010 was approximately 51.65 percent against the regulatory minimum ratio of 20 percent, indicating availability of excess liquidity in the market (BOT, 2010b). Also, the ratio of gross loans to the total deposits for the sector was approximately 58.84 against the regulatory maximum of 80 percent.

In spite of banks' shift towards funding SMEs, the Tanzanian banking sector does not appear to be meeting the credit requirements of SMEs. This implies that banks do not lend to everybody who can afford the price of credit, but they (the banks) apply some degree of rationing. Given the fact that the financial sector in Tanzania is liberalized, the existence of asymmetric information in credit market may explain the credit rationing behaviour of the banks. The argument regarding information asymmetry is supported by Olomi (2009) and Temu (1998) who argue that one of the reasons why most SMEs in Tanzania fail to access adequate credit from the banks is a failure of these SMEs to provide adequate and reliable information about their businesses, followed by lack of collateral. The authors attribute this to the fact that SMEs operators lack the appreciation of the need for either keeping business and financial records or asking professional accountants to do so on their behalf.

Some researchers have investigated a variety of factors, at firm level, which might influence credit rationing for SMEs (Han, 2008; Becchetti *et al.*, 2010; Freel *et al.*, 2010; Zambaldi *et al.*, 2011; Drakos and Giannakopoulos, 2011; Hashi and Toci, 2010; Chakraborty and Mallick, 2012). Since the degree of information asymmetry is not directly observable, firm and owner manager's characteristics have been used as proxies for the severity of informational asymmetries and transaction costs. Specifically, they found that some firm and owner manager's characteristics have significant effects on bank's credit rationing. However, little is known on the relationship between firm and owner manager's characteristics on the bank's credit rationing in Tanzania.

The concept of credit rationing and its determinants have been discussed in the previous studies; however there are still some gaps which need to be addressed. Previous studies have examined the influence of information asymmetry and transaction costs on credit

rationing using direct measures of firm and owner manager characteristics. Little is known on the combined effect of information asymmetry proxies on credit rationing. Therefore in addition to what has been done in previous studies, in this study we develop a comprehensive measure of information asymmetry and transaction costs by constructing indices of asymmetric information and transaction costs based on previous measures of information asymmetry and transaction costs, and measures suggested by researcher.

Other studies also fail to properly address the source of information asymmetry between SMEs and the banks. Previous studies consider information asymmetry on the side of lender not knowing the insight of borrowers. However, information asymmetry may also entail a borrower not knowing the insight of the lender such as bank requirements-lending conditions and procedures. The borrower's knowledge on the banks' requirements is crucial in delivering information to the lender; knowing that most SMEs are rationed because of information gap. Similarly borrower knowledge on their business and cost of preparing loan request are very crucial in delivering information required by the lender in order to access the bank credit. Therefore as part of entrepreneur characteristics, this study examines borrower knowledge on bank requirements and their business, the costs of preparing loan request as well as credit rationing.

Moreover, there is lack of empirical evidence concerning accounting practices and credit rationing. Drakos and Giannakopoulos (2011) and Hashi and Toci (2010) investigated whether or not the use of external audit and application of international accounting standard affect credit rationing. These studies did not take into consideration the accounting practices of the firm; the studies based only on the last prepared statements rather than on the reliability and accuracy of the source of the data. Therefore as part of firm characteristics, this study examines accounting practices of the firm-record keeping,

preparation of financial statement and disclosure (banking collection) as well as credit rationing. These variables are very crucial in delivering information on financial viability of the funded project.

Moreover, studies use demand side data (SMEs); and until now, the supply side perspective (commercial bank) has been relatively neglected, and there has been insufficient integration between studies on the demand side and those on the supply side. In particular, the results of the demand side survey alone may not provide an accurate picture of credit rationing determinants, since such results do not always correspond with the perspective of commercial banks on credit rationing. Therefore, these studies use data from both SMEs and commercial banks. The findings on the supply side are used specifically to enrich and complement the findings of the demand side data. This approach may help to explain issues and anomalies on the demand side data.

In a situation where economically viable projects may have to be restricted or even abandoned because of funding difficulties, credit rationing has serious negative consequences for growth of SMEs, and which have serious implications on the reduction of poverty and unemployment. Thus, coherent formal analyses of the extent of rationing (demand levels or satisfaction), determinants of credit rationing and its impact on SMEs growth have not yet been done in Tanzania. Hence, it is important to investigate this phenomenon in the context of Tanzania where evidence on this matter is scarce.

1.3 Objectives of the study

1.3.1 General objective

The general objective of the study is to examine firm level determinants of credit rationing and the impact of credit rationing on SMEs growth. The specific objectives of the study are as stated below:

1.3.2 Specific objectives

Specifically, the study intended to:

(i) Determine the extent of rationing and its variation across industries, firm size gender of owner, firm age, governance structure and loan maturity

(ii) Determine the influence of firm and entrepreneur characteristics on bank's credit rationing

(iii) Determine the influence of information asymmetry and transaction costs on bank's credit rationing

(iv) Determine factors that constrain the banks from supplying adequate credit to SMEs.

(v) Determine whether or not the growth of rationed SMEs in terms of sales and employment differ from the growth of non rationed SMEs

1.4 Study hypotheses

H_1: The extent of rationing varies significantly across industries, size, gender, business age, owner age, governance structure, and loan characteristics.

H_2: Characteristics of entrepreneur influence the bank's credit rationing.

H_3: Firm's characteristics influence bank's credit rationing.

H_4: The higher the information asymmetry and transaction costs the higher the probability of rationing

H_5: The growth of rationed SMEs in terms of sales and number of employees varies significantly from the growth of non rationed SMEs.

1. 5 Justification of the study

The undertaking of this study stems from the need to provide a deeper understanding of the firm and entrepreneur attributes that determine bank credit rationing to the SME sector. Access to adequate bank credit is one of the determinants of growth and survival of the SME sector. Furthermore, restrictions on bank credit to SMEs are a global phenomenon (Aterido *et al.*, 2011).

It is also important to note that this study also contributes to the body of knowledge with regards to credit rationing. The study is an expansion of previous studies on credit rationing as it tries to explain how information asymmetry and transaction costs account for the existence of credit rationing in SMEs credit market. The study also considers information asymmetry and transaction costs on the side of both the borrower and the lender. In addition, data utilisation from Tanzania contributes to literature on credit rationing in developing countries; this is unlike the traditional practice where such data are usually based on SMEs in developed economies rather than SMEs in other economies. Data from Tanzania is therefore used to test theories of credit rationing and to confirm and expand the scope of theoretical application.

From a practical perspective, the findings are also expected to be significant to policy makers, commercial banks, and entrepreneurs. As Storey (1994b) notes, if business proposals are turned down for reasons not connected with the viability of the project itself, such as lack of track record and collateral or that collateral are small among the firms , then credit rationing may be a problem in the credit market and may become the subject of

government intervention. The government of Tanzania has established various programmes, financing schemes, and policies to assist the SME sector (Tamara,2006) . However, the effectiveness of these policies and programs are dependent on a thorough understanding of obstacles constraining SMEs' operations and growth. The findings of this study are expected to provide information on the magnitude of credit rationing to SMEs, thus making the targeted policy intervention become more effective. This is especially because of the fact that the extent of credit rationing varies across firms.

According to Satta (2006), lack of appropriate instrument to manage risk and inability to solve problems resulting from asymmetric information, make the banks become unwilling to provide the much-needed finance to SMEs. The findings from this study will also assist the commercial banks in developing better lending strategies. Likewise, SMEs owner managers will be able to understand the factors constraining them from accessing adequate bank credits.

1.6 Conceptual framework

The conceptual framework for this study is justified in the theoretical and empirical literature in Chapter Two. The conceptual framework (Fig. 1) shows that under asymmetric information and fixed transaction costs, credit rationing is influenced by firm characteristics and entrepreneurs' characteristics. The reason is that when the lender is unable to assess the risk factors or is unable to collect relevant information, he or she uses borrower characteristics as a proxy for the risk factor. As a result, some of the firms may be denied credit (totally rationed), others may receive less than what they applied for (partially rationed) and others may receive the amount applied for (none rationed). As a consequence, the growth of rationed SMEs will be affected by credit rationing.

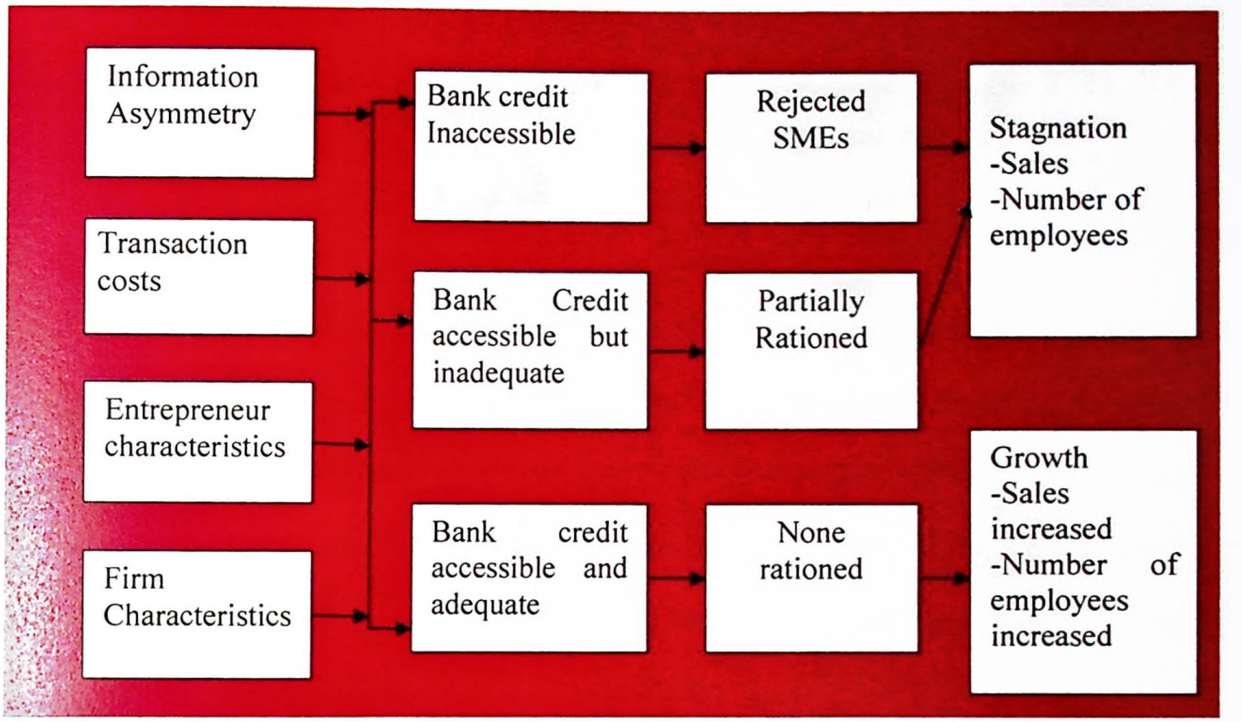

Figure 1: Conceptual framework.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definition of key concepts

2.1.1 Credit rationing

In this study, the term credit rationing and credit constraint are used interchangeably. Being credit rationed is defined as a state in which the loan amount approved by the lender is less than the loan amount originally applied for by the borrower; and this includes those firms whose loans' applications were rejected. In other words, if the firm is credit rationed, there must be excess demand in the loan market. In such a circumstance, the commercial banks are effectively rationing credit.

2.1.2 Small and Medium Scale Enterprises (SMEs)

Small and medium scale enterprises do not have standard definition. Different countries define SMEs by using various types of measures that depend on the level of development. It is however, generally admitted that most definitions of firms, which base on size are centred on the number of employees and the amount of capital invested in business (Wiklund *et al.*, 2009) . In this study, SMEs are defined according to Tanzanian standards; in this respect, they (SMEs) are defined as micro, small and medium-size enterprises in non-farm activities (URT, 2003).

Table 1: SMEs definition

Category	Employees	Capital Investment
Micro	1-4	5 mil
Small	5-49	>5-200 mil
Medium	50-99	>200 – 800 mil

Source (URT, 2003)

NB: In the event of an enterprise falling under more than one category, then the level of investment will be the deciding factor.

2.1.3 Growth of SMEs

In this study, the growth of SMEs is defined in terms of changes in the amount of sales and employment.

2.1.4 Entrepreneur

In this study, the terms entrepreneur and owner-manager are used interchangeably to define a person who both owns the firm and takes an overall responsibility for the strategic and operational direction of the business.

2.1.5 Entrepreneur characteristics

Entrepreneurial characteristics are those traits or attributes that are specific to the owner of the firm. They (traits or attributes) include SMEs owner/manager attributes related to informational asymmetries and transaction costs, and therefore are expected to affect credit rationing of the firm negatively or positively. Entrepreneur characteristics include sex, age, managerial competence (education, experience), knowledge on lending condition and business project, the cost of preparing business plan and accounting information, owner wealth, and relationship with financial institutions.

2.1.6 Firm (business) characteristics

Firm characteristics are traits or features specific to the firm. They (traits or features) include firm-specific attributes related to informational asymmetries and transaction costs and therefore are expected to affect credit rationing of the firm positively or negatively. Business characteristics include age, size, industry, geographical distance, governance structure, accounting practices-record keeping, preparation of financial statement, and banking collections. Others include collateral, loan size, and loan duration.

2.2 Theoretical framework

Theories discussed in this section are based on new institution economics. New institution economics explains credit rationing by asymmetric information and transaction costs. Theories of bank behaviour under asymmetric information view collateral and relationship lending as a major tool of alleviating credit rationing. Therefore, this section contributes to new institution economics by developing a systematic explanation of credit rationing under uncertainty, supplemented by theoretical triangulation involving relationship lending, and collateral theories to enrich observations and extend the theory.

2.2.1 Credit rationing

In the classical demand-supply economic theory, market clears through price (Voordeckers and Steijvers, 2008). However, in credit markets where the interest rate is thought of as the loan price, the situation is different. Some individual borrowing demands can only partly be satisfied, given the offered interest rates; and other borrowers cannot get the loans even if they are willing to pay a higher interest rate than what the lenders are asking for. As Voordeckers and Steijvers (2008) remark, "credit rationing is seen by many Keynesian economists nowadays as one of the most important examples of market failure

in a modern capitalistic economy" because "there are no competitive forces in action, bringing demand and supply together".

The concept of credit rationing was developed in the early 1950s as an integral part of the credit availability doctrine due to changing economic conditions (Williamson, 1987). Advocates of the availability doctrine suggest that monetary policy may operate in part through a rationing channel rather than through an interest rate channel (e.g., Scott 1957a, 1957b). According to these theories, the banks are limited by availability of the funds that they can attract. Due to this supply constraint, credit is always rationed and the credit market balance is purely determined by the supply conditions and real economic activity. In such a context, monetary policy will be a tool to act on the availability of credit instead of changes in the interest rate. The problem with these theories is that they did not consider the complexity of the borrower-lender relationship, especially the problems resulting from the asymmetry of information.

2.2.1.1 Information asymmetry, transaction costs and credit rationing

The availability of information in making decision to lend or not is important because it enables the bank to evaluate the risk-return profile of the loan application and hence sets the level and terms of credit to be extended to the borrower. However, according to Gorman *et al.* (2005), full information about the borrower's project and behaviour may not always be available. This leads to information asymmetry situation.

The seminal work of Akerloff (1970), suggested that the premise of information asymmetry (i.e., deviation from perfect information) is the concept that at least one party to a contract relationship, such as lender-borrower or buyer-seller, is ignorant of relevant information pertaining to a transaction. Jaffee and Russsel (1976), Stiglitz and Weiss

(1981) and Williamson (1987) posit that information asymmetries among lenders and borrowers in connection with project quality, the behaviour of borrowers and the risk of default can lead to credit rationing. As Jaffee and Russell (1976) and Stiglitz and Weiss (1981) observe, under asymmetric information adverse selection and/or moral hazard can lead to credit rationing in a credit market. They argue that, borrowers know their creditworthiness, while lenders do not; any attempts by lenders to differentiate (screen) borrowers by raising interest rates leads to a reduction in their profitability, as more creditworthy borrowers drop out of the market when interest rates rise beyond a certain threshold. Consequently, banks engage in credit rationing rather than raise interest rates. According to Jaffee and Russell (1976), credit is rationed in the sense that an individual borrower receives a less amount of loan than the one he or she would like to get, at the offered interest rate. In the view of Stiglitz and Weiss (1981), borrowers are identical ex ante, but some receive loans and others do not.

Transaction cost economics, unlike traditional neoclassical economic theory, recognizes that commercial activity does not occur in a frictionless economic environment. Instead, it posits that there are costs to carrying out any exchange (Coase, 1937). Transaction costs include the costs of information, negotiation, monitoring, coordination, and enforcement of contracts. The work of Williamson (1987) and Storey (1994b) follows Coase's line of thinking in explaining credit rationing. Williamson (1987) and Storey (1994b) explain credit rationing in terms of fixed assessment and monitoring costs. Assessment costs are incurred prior to the bank's decision to lend; and monitoring costs are incurred when the bank makes sure that the customer is acting in accordance with the contract. Assessing an individual loan request entails costs that are at least partially independent of the loan amount. Fixed transaction costs in credit assessment, processing and monitoring result into decreasing unit costs as the loan size increases. These fixed transaction costs drive a

wedge between funding costs of financial institutions and the lending rate they charge borrowers. In a world of uncertain returns on investments, higher transaction costs and the resulting higher lending costs can increase the likelihood of borrowers' failure to pay due to high repayment burden. Rather than increasing the interest rate, financial institutions might ration credit because higher interest rates would lead to lower expected repayments (Williamson, 1987). Borrowers on the other hand appear to be much more constrained by transaction costs, which are much more for SMEs. Ang (1991) and Chittenden *et al.* (1996) indicated, monitoring costs to be much high for providers of external funds due to the scarcity, and often low quality of internal information in SMEs.

The impossibility to use interest rates as a screening technology encourages lenders to use observed borrower characteristics in order to decide who obtains credit and how much (Muravyev *et al.*, 2009, De Young *et al.*, 2008, Lehmann and Neurberger, 2001). Therefore, attribute of the entrepreneurs and characteristics of the enterprises are a major proxy for information asymmetry and transaction costs.

2.2.1.2 Measurement of information asymmetry and transaction costs

Information asymmetry is said to be a major cause of credit rationing, thus its impact needs to be measured and empirically tested. Since the degree of information asymmetry is not directly observable, the use of proxies in the measurement of information asymmetry becomes essential (Sufi, 2007; Karlan and Zinman, 2009). There have been various measures of information asymmetry and transaction costs. Williamson (1987) and Boocock and Woods (1997) suggested the tendency of transaction costs to decrease with firm size largely because of fixed costs in assessing credit application and proportionately higher monitoring costs. Volpe and Schenck (2008) reported further that small firms are more likely to be relatively more informationally opaque (i.e., high information

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asymmetry) as opposed to information transparency (i.e., low information asymmetry). Petersen and Rajan (1994) also noted that large information asymmetries existed among small firms. Petersen and Rajan (1994) maintain that, information asymmetry is relatively high for young firms given their shorter track record, whereas Petersen and Rajan (2002) suggest that information asymmetry and transaction costs tend to increase with distance. Fama (1985), Diamond (1984, 1989) and Petersen and Rajan (1994) suggest that information asymmetry decreases with banking relationship. Drakos and Giannakopoulos (2011) and Hashi and Toci (2010) suggest that information asymmetry decrease with availability of audited financial statement. Information asymmetry is also high for young borrowers because young managers control fewer resources, have little experience, low reputation and responsibility. As Bester (1985, 1987) contends, collateral alleviate information asymmetry problem.

Most empirical studies, however, use only one or two variables to measure information asymmetry. Therefore the present study, aimed to develop a comprehensive measure by constructing indices of asymmetric information and transaction cost based on various previous measures of information asymmetry and transaction costs. In addition to the measures used in the previous studies the present study include firm accounting practices, knowledge on lending requirement and business project, knowledge and costs of preparing a business plan. These variables are very crucial in delivering information concerning viability of funded projects. Specifically, our Asymmetric Information Index (AIINDX) and Transaction Cost Index (TCINDX) are calculated by adding the values of the information asymmetry and transaction cost proxies.

2.2.2 Collateral, relationship lending and credit rationing

The probability that a constraint is binding for a given firm depends on the availability of signalling and/or screening devices to overcome asymmetric information (Berger *et al.*, 2011a, b). Apart from sufficient performance and satisfactory risk exposition of the credit funded project, individual characteristics and skills of the borrower, availability of collateral and close relationship with the bank are assumed to be among the most important devices in mitigating information asymmetry problems and avoiding credit rationing (Chakraborty and Mallick, 2012; Voordeckers and Steijvers, 2008). The conversional view is that availability of collateral and closer relationship with the banks can (at least partly) overcome the asymmetric information and incentive problems and, thus, reduce enterprises' credit constraints (Chakraborty and Hu, 2006; Jiménez *et al.*, 2006; Brick and Palia, 2007).

From a theoretical perspective, the collateral required by a bank will mitigate the problems of adverse selection and moral hazard ex ante. Collateral induces a borrower to reveal his or her default risk, and acts as a signalling device (Bester, 1985, 1987; Besanko and Thakor, 1987). It also reduces loan risk because the bank has a legal claim against collateralized asset in case a borrower defaults. Therefore, the existence of collaterals is expected to increase credit availability and reduce credit rationing.

Banking relationships also seem to alleviate credit rationing because banks can easily monitor and access information regarding borrowers' history and actions through close and repeated transactions (Fama, 1985; Diamond, 1984; Diamond 1989; Petersen and Rajan, 1994). This allows the lender to learn about the borrower and thereby reduce the existing information asymmetries and credit rationing as a result. Diamond (1991) argue that borrowers who suffer from the most severe information asymmetries (e.g., small firms

with less established repayment histories and/or borrowers with poor credit ratings) have the most to gain from banking relationship. Empirical analysis has shown that there are important benefits from strong banking relationships and collateral in alleviating credit rationing (Boot, 2000).

2.2.3 Credit rationing

Literature shows that information asymmetry and fixed transaction costs lead to credit rationing whenever the information problem remains unresolved. In this study, it is assumed that credit rationing stems from information asymmetry and transaction costs. Being credit rationed is defined as a state in which the loan amount approved by the lender is less than the loan amount originally applied for by the borrower at the prevailing interest rate, and this includes those firms whose loan applications are rejected. In other words, if the firm is credit rationed, there must be excess demand in the loan market. In such a circumstance, the commercial banks are effectively rationing credit.

2.3 Measuring credit rationing

In principle, the volume of credit rationing should be measured by the difference between the loan demand and the bank supply for the rationed customer (Jaffee and Modigliani, 1969). As Jaffee and Stiglitz (1990) noted, the magnitude of this problem in the economy could be measured if the demand for and supply of credit was known. However, what is observed is the quantity of credit that is transacted and not the excess demand for credit. Hence, credit rationing may be extremely difficult to identify.

A study on the existence of credit rationing using micro data would be superior to studies that use macro time series data. As Perez (1998) states, the use of aggregated data tends to average the individual company level data. By this aggregation process, a study based on

these averages can lead to a result in which no credit rationing appears to be present, while in reality some companies do struggle with credit rationing (aggregation bias problem). Shen (2002) also observes that the use of aggregate data makes it difficult to tell whether the reduced credit is supply constrained or whether it is due to a reduction in the credit demand.

In the absence of direct individual information on the quantity of loans that are demanded and supplied, various approaches have been adopted to test for credit rationing. The empirical literature has used three different measures of credit rationing: an indirect measure, which is provided by the disequilibrium credit rationing approach; the use of proxies for credit rationing; and finally, a direct measure, which is provided by the implementation of a data survey based on the diffusion of a questionnaire addressing the demand size (borrowers) and/or the supply side (the banks).

2.3.1 Indirect measures of credit rationing

There are two direct measures of credit rationing. The first indirect measure is demand and supply disequilibrium approach. Maddala and Nelson (1974) discuss the appropriate maximum likelihood method which identifies the gap between supply of and demand for credit. The model relies on three equations namely demand, supply and transaction equations. The demand and supply equations are estimated using a set of explanatory variables, and a subsequent transaction equation represents the amount of bank credit received by the borrowers. Ogawa and Suzuki (2000), Atanasova and Wilson (2004), Shikimi (2005), and Voordeckers and Steijvers (2008) have used this methodology to measure credit rationing using the firm level data in different countries.

Ogawa and Suzuki (2000) used a panel of 517 Japanese firms followed over the years from 1980 to 1993. These scholars observed that over the period from 1980 to 1993, the proportion of rationed firms was about 36 percent, with a maximum of 63 percent in 1981 and a minimum of 7 percent in 1991. The amount of bank credit demanded is modelled as a function of the level or the expansion of the firm's activities, which are measured by their sales; the firm size, which is measured by their capital stock; and alternative sources of finance. In other words, it is their profit as well as a dummy variable for access to financial market, and the cost of the bank credit. The maximum amount of credit available to a firm (supply of loan) was assumed to depend on a dummy for an affiliation with the "main bank", on the collateral (capital stock, land) and on interactions between these variables.

The model which was estimated by Atanasova and Wilson (2004) using a panel of 639 UK firms which were observed over the years 1989-1999, also assumes that the demand for loans depends on the firms' activity as measured by sales, on their size (measured by total assets) as well as on substitutes for bank loans (cash-flow, trade credit, a dummy variable for access to public financial market), industry dummies and the cost of the bank credit. The supply of loans is supposed to depend on collateral (as measured by the total assets) and on the firm's specific risk (measured by a dummy linked with the coverage ratio). They (Atanasova and Wilson, 2004) estimated the proportion of firms being credit rationed to be slightly less than 43 percent over the period from 1990 to 1999; rationing being maximum in 1990 and 1992 at 47.9 percent and minimum in 1999 at 35.1 percent.

Shikimi (2005) used a much larger sample than the sample used by scholars in the two previous studies: 34,330 Japanese firms were observed over the years from 2000 to 2002. The specification of the demand equation is very similar to the previous ones: demand

depends on the firms' activity (sales), the firm's size (total assets), the substitutes for bank loans (cash-flow, trade credit) and the cost of the bank credit. Supply is assumed to depend on the firm's collateral (tangible assets), the firm's risk (operating profit/interest, assets/liabilities) as well as macroeconomic conditions as measured by the log (GDP). Shikimi (ibid) found that, over the period from 2000 to 2002, the proportion of rationed firms was about 39.8 percent.

Furthermore, another study by Voordeckers and Steijvers (2008) from panel data of more than 2698 SMEs in Belgium showed that more than 50 percent of SMEs were credit rationed. The amount of bank credit demanded is modelled as a function of the level or the expansion of the firm's activity (return on asset, internal cash flow, asset growth quick ratio), other sources of capital that are substitutes to bank loans, business outlook and the cost of bank credit. The maximum amount of credit available to a firm is modelled as a function of the firm's collateral and risk (size, industry, interest cover, and solvency).

The second indirect measure relies on the use of proxies for credit rationing. In the previous studies, an exogenous classification into those a priori which are expected to be more likely and those a priori which are expected to be less likely to face significant credit constraints, was mostly used. Among the early influential contributions come from Fazzari *et al.* (1988) who classified the enterprises in heir sample on the basis of the firms' dividend policy. The authors hold that the enterprises retaining a larger fraction of profits as non distributed earnings are the most likely rationed; the sensitivity of investment to cash flow is higher for these firms.

Berger and Udell (1992) employed the share of the new loans as an indicator of liquidity constraints, given that, if credit rationing is extensive, this share should increase during the

times of credit squeeze. Petersen and Rajan (1994) and Harhoff and Korting (1998) used trade credit as a proxy for credit rationing. This is supported by the pecking order theory (Myers and Majluf, 1984), which posits that the second financing source of investment projects after internal financing is bank financing. If firms are credit rationed by banks, then such firms will switch to alternative external sources of financing. In such a framework, trade credit acts as a substitute for a bank credit; and the volume of trade credit will be positively correlated with credit rationing. An extensive use of trade credit suggests that the firm is potentially credit rationed. However, the use of trade credit as a proxy for credit rationing remains controversial, and many firms that have easy access to bank loans use trade credit to reduce transaction costs (Petersen and Rajan, 1994). In this context, an extensive use of trade credit may not mean that the firm is credit rationed.

Korajczyk and Levy (2003) used a high retention rate, combined with the existence of investment opportunities to identify financially constrained firms. Since dividends and security repurchases compete with investment for funds, firms that have investment opportunities and face relatively high costs of external finance should choose to retain net income for investment. At the same time, Kaplan and Zingales (1997) criticize the methodology used by Fazzari *et al.* (1988) showing that firms that appear less financially constrained exhibit significantly greater cash flow sensitivities than the firms that appear more financially constrained. For this reason they argue that higher investment-cash flow sensitivities cannot be interpreted as evidence that the firms are more credit constrained.

2.3.2 Direct measures of credit rationing

Direct measure is provided by the implementation of the survey data based on the diffusion of a questionnaire addressing the demand size (borrowers) and/or the supply side (the banks). The measures of credit rationing used in the survey data are as follows: first,

the application rate (did they apply for credit); second, the refusal rate- for the applicants-, when the credit is denied is a proxy for pure credit rationing; third, the partial approval rate which is a measure of quantity rationing (when the granted credit is lower than the requested amount); finally, the rate of non-applicants that needed credit but feared a rejection; which is a measure of self rationing.

The earliest empirical evidence of measuring credit constraints directly through interview can be traced back to Jappelli (1990). Jappelli (1990) analyzed the characteristics of credit constrained households in the U.S. economy. Credit rationing was measured as the presence of demand for loans, by asking the respondent whether or not they would have liked to borrow more at the prevailing interest rate. In case of a positive answer, the respondents are classified as credit constrained. The same applies to non-borrowers who respond that they could not get credit although they liked to. Since then, the methodology of direct measurement of rationing has been extensively used in the literature. Levenson and Willard (2000) adopted the definition of Jappelli (1990) to investigate characteristics of credit constraint small business in the U.S. The authors conclude that credit rationing is not a pervasive phenomenon in the U.S. economy.

Drakos and Giannakopoulos (2011) using survey data for firms from Eastern European transition economies investigated the determinants of credit rationing. Their rationing definition incorporates firms whose loan applications were rejected and 'discouraged' potential borrowers. Explanatory variables were the firm's investment opportunity set (proxies by profitability and fixed assets growth) firm age, firm size, gender of the principal owner, the use of external auditing, application of international accounting standards, maintenance of savings account (as a proxy of banking relationships). The findings revealed that credit rationing depends on the firm size, profitability growth,

ownership type, legal status, sectoral heterogeneity and the country-specific level of domestic credit. Hashi and Toci (2010) investigated whether or not firm characteristics have any influence on the likelihood of firms applying for a loan and being denied credit. Firm characteristics include the firm's age, size, ownership (foreign, private) performance (sales growth or profitability), use of accounting standard, sector and country of origin. The results indicate that small and young firms have a higher probability of being denied credit while foreign firms are less likely to be denied credit. The coefficients on sales change, profitability and use of accounting standard have an estimated negative effect and are statistically significant.

Becchetti *et al.* (2010) applied a comprehensive approach by cross-validating the analysis with both balance sheet and qualitative data on self declared credit rationing and financing constraints. Qualitative information shows that (self-declared) credit rationing is related to firm size, age, location and lenders' rational decisions taken on the basis of their credit risk models. The same result does not apply when they consider a group of financially constrained firms (which do not seem to have higher investment–cash flow sensitivity).

Freel *et al.* (2010) investigated characteristics affecting self credit rationing and discouraged borrowers using the traditional characteristics of the firm (age, size, industry sector) and more manager characteristics (age of the owner, ownership structure, gender, education level, owner personal wealth and the strategy focus-innovation, quality and cost) were tested. The data were drawn from the 2005 Biennial Survey of Small Business in the UK. Their results reveal that family ownership and gender have an impact on the credit rationing. Zambaldi *et al.* (2011) analyzed credit granting decisions from a sample of 65,535 SME credit proposals submitted to a large Brazilian bank. The probability of a loan approval was a dependent variable while age, collateral, loan size and branch location

were explanatory variables. Probit analysis reveals that small and young firms face credit rationing while collateral reduces the probability of rationing. The authors also found a negative effect on loan size. The findings also revealed that the bank in their study faces difficulties in expanding the supply of credit to small firms mainly because of transaction costs, collateral-dependency and constraints due to asymmetric information.

Han (*2008*) examined how the impact of relationship banking on severity of financial problem is perceived by entrepreneurs. An ordered logistic model was used on the UK data set to empirically test the hypotheses. A dependent variable, severity is rated and reported by the respondent with a scale of 1 to 10, where 1 is no problems and 10 means critical problems. The author found out that the relationship lending alleviates the severity of financial problems perceived by the entrepreneurs. Han (ibid) also found out that some characteristics of entrepreneur (e.g. education, experience, personal wealth) and business (e.g. size and credit card) have a strong impact on the severity of financial problems faced by SMEs.

De Bodt *et al.* (2005) examined the determinants of credit rationing probability using a survey of 296 firms conducted in Belgium and found a positive relationship between credit availability and the duration of the lending relationship. An increase in the number of banks leads to an increase in the probability of credit rationing; however, this effect may be stronger or weaker depending on the size of the lender and of the borrower.

2.3.3 Comparing the direct measures and indirect measures of credit rationing

The main problem with indirect indicators is that it is impossible to validate the assumption that the variable selected as a proxy of rationing is appropriate. Furthermore, regardless of how good these proxies are, they may reflect other effects that have little or

nothing to do with credit rationing (Feri and Muro, 2012). The use of disequilibrium models to measure credit rationing gives insufficient information regarding the determinants of credit rationing. In addition, choosing the set of significant variables in the supply and demand equations is complex. For example, as pointed out by Sealey (1979) and Pruteanu (2004), some variables, such as the quoted interest rate, affect both the supply and demand of credit.

On the other hand, direct measures enable the respondents to provide detailed information regarding their borrowing experience; this allowed a direct identification of credit rationed firms that permit an explicit connection between rationing and borrower characteristics (Drakos and Giannakopoulos, 2011). This distinction is of special importance because from a methodological point of view, the empirical investigation of credit rationing is usually constrained by the difficulty in identifying potential borrowers that are indeed credit rationed (Angelin *et al.*, 1998). The main weakness of direct measures of credit rationing is the fact that even though such measures support the existence of credit rationing, they provide no direct measure of its magnitude. However, Chakraborty and Mallick (2012) used direct measure of credit rationing to measure the extent of rationing as the difference between the desired debt and the actual level of the debt received.

2.3.4 Measuring credit rationing in this study

Different approaches of measuring credit rationing exist. Recent studies solemnly uses survey information to measure credit rationing. Direct measures appear to overcome the problems associated with the utilization of indirect indicators regarding the classification of firms as being more or less likely to be credit rationing, such as the impossibility to verify the selected indicators ability to reflect rationing, and the possibility that these indicators embody some other types of information unrelated to rationing. Since most

SMEs in Tanzania do not keep financial records, and that even those who keep such records are not willing to share these records with outsiders; the use of disequilibrium approach may be difficult. Furthermore, the disequilibrium approach provides little information on the determinants of credit rationing, and which are very crucial for policy makers. These are the main reasons as to why a direct measure of credit rationing is employed in this study.

Credit rationing is measured directly by collecting credit information in a survey through interviews. As has already been said earlier, credit rationing is defined as the presence of excess demand for loans at the prevailing interest rate: by asking the respondents whether or not they would like to borrow more at the prevailing interest rate. If the answer to this is yes, this is taken as evidence of excess demand for the bank credit. The respondents were also asked to indicate the amount of loan they were willing to borrow and the amount of loan they received. This information enabled the researcher to measure the extent of rationing as the percentage different between demand and supply for credit for rationed SMEs.

2.4 Determinants of credit rationing

Recently, firm and entrepreneur characteristics have been tested as potential determinants of credit rationing. This section is devoted to reviewing literature on firm and entrepreneur characteristics.

2.4.1 Age and size

The age of the firm is usually viewed as an indicator of the firm's quality, since longevity may provide a signal for survival ability and quality of management as well as the accumulation of reputational capital (Diamond, 1991). Moreover, the information

asymmetry is relatively high for young firms given their shorter track record (Petersen and Rajan, 1994). As Dunkelberg (1998) argues, because of the liabilities associated with newness, banks may view younger firm as riskier than older firms. And according to Martinnelli (1997), lack of reputation constraints younger firms from borrowing; however as they grow older, information asymmetric decreases. Therefore, the age of the firm should show the level of the firm's specific information that the banks have acquired. The older the firm the more the information the banks accumulate about that firm. Hence the lower the rationing.

A number of explanations have been given regarding small firm disadvantages in the loan markets, and these include, for instance, their higher relative probability of failure (Jensen and McGuckin, 1997), fixed costs in assessing application for finance (Storey, 1994b), and proportionately higher monitoring costs (Boocock and Woods, 1997). In addition unlike larger ones, smaller firms may have lower collateral and cash flow relative to their liabilities, and a likelihood of unit bankruptcy costs decreasing with size (Audretsch and Elston, 2002). Moreover, small firms provide less information to outside financiers than medium and large firms because of absence of disclosure rules.

Empirically, due to the mixed results, the relationship between a firm's age, the size, and credit rationing is still an unresolved issue (i.e. positive, neutral, or negative). For instance, some studies have shown that the probability of rationing is high for small and young firms (Hashi and Toci, 2010; Smorfitt, 2009; Agostino *et al.*, 2008; Voordeckers and Steijuers, 2008; Levenson and Willard, 2000; Harhoff and Korting, 1998; Petersen and Rajan, 1994). The above results contradict the results by Aterido *et al.* (2011), who found that a firm's size is not related to a generally higher or lower perception about credit constraint. Lehmann and Neurberger (2001) used probability of loan approval as a proxy

for the availability of credit in Germany and found out that age and size have no impact on credit availability. Likewise Bebczuk (2004) found that a firm's size has no impact on credit rationing in Argentina.

2.4.2 Collateral

Collateral is an asset of the borrower that is automatically transferred to the lender should the project revenues not be sufficient to repay the loan in full. Collateral includes assets such as land and buildings, machinery and equipment, and stocks. As Bougheas *et al.* (2005) contend, collateral is an important factor for SMEs to access bank finance. Collateral reduces the riskiness of a loan by giving the financial institution a claim on a tangible asset without diminishing its claim on the outstanding debt. It is pointed out (Coco, 2000) that collateral is the lender's second line of defence. Collateral can solve problems derived from asymmetries in valuation of projects, uncertainty about the quality of the projects and the riskiness of borrowers, and problems related to the cost of monitoring or supervising borrowers' behaviour. The guarantee provided by collateral allows financial institutions to offer credit to SMEs on favourable terms even if uncertainty and informational opacity characterize the firm (Berger *et al.*, 2011a, b).

Even though literature identifies collateral as a key contracting tool employed by lenders to reduce the problem associated with asymmetrical information; the empirical results are mixed about this aspect. In some studies, collateral seems to reduce the behaviour of the borrower to redirect borrowed funds to other investments (Hernandez-Canova and Martinez-Solano 2006; Chakraborty and Hu, 2006; Brick and Palia, 2007). In other studies collateral seems to play a signalling role in solving the adverse selection problem (Lehmann and Neuberger, 2001; Jiménez *et al.* 2006). However, other empirical works do not confirm any of the theoretical views: they show no significant relationship between the

risk and the pledging of the collateral (Cressy and Toivanen, 2001; Elsas and Krahen 1998). These studies provide indirect relationship between collateral and credit availability. Little work has been done to empirically assess as to whether or not the use of collateral enhances adequate supply of credit for SMEs. Even here, the results are inconsistency. Ogawa and Suzuki (2000), Atanasova and Wilson (2004), Shikimi (2005) and Carbo-Valverde *et al.* (2009) confirm that collateral is an important determinant of the supply of bank debt. Based on a maximum-likelihood estimation of a disequilibrium demand and supply model of bank debt, the referred studies reveal that collateral is a significant factor in mitigating credit rationing even though these studies differ in terms of data (Japanese, UK, and Spain firm data) and the collateral measures used.

Ogawa and Suzuki (2000) used the collateral amount of only land stock, while Atanasova and Wilson (2004) used the total asset base. Shikmi, (2005) and Carbo-Valverde *et al.* (2009) used the tangible fixed assets over total assets. Unlike these studies, Shen (2002) estimated a similar disequilibrium model using the same maximum-likelihood estimation method, but referring to loan data from Taiwan. However, that study revealed no significant impact of collateral, which is measured by a collateral dummy, on the supply of bank debt. In another study, Petrick (2004a) found that the reputation of the borrower, but not the availability of land as collateral, has an effect on credit rationing in Poland. However, Petrick (2004b) presented evidence that land as collateral plays a role in short-term lending.

This variation in the results may be a result of deficiency in measurement. This measure does not provide a direct relationship between collateral and credit availability; a firm may possess an asset but it may not be adequate in the bank's point of view. Unlike the studies cited above, the current study used a direct measure of collateral: the collateral was

measured as the percentage of the amount of loan a borrower is willing to borrow. This measure provides a direct picture of high collateral requirements of commercial banks, which have been contested by many SMEs.

2.4.3 Governance structure

Corporate governance is seen as the process and structure used to direct and manage business affairs of a company towards enhancing business prosperity and corporate accountability (Carter *et al.*, 2003). Claessens *et al.* (2002) maintain that better corporate frameworks benefit firms through greater access to financing, lower cost of capital, and better performance. Chackhraborty and Mallik (2012) considered the ownership type as another potential determinant of rationing that captures governance characteristics.

In many instances, SMEs are made up of only the owner who is a sole proprietor and manager. Ownership is typically highly concentrated in the hands of the owner and perhaps also some friends and members of his family, who are willing to assume and share the risk (Hart, 1995). In addition, SMEs have few employees who are mostly relatives of the owner. Private benefits of control include the prestige and status that comes with ownership, the power to decide on the business strategy of the firm, and independence from superiors (Huyghebaert *et al.*, 2007). On the positive side, family owned firms are likely to adopt more conservative investment strategies as well as minimize the probability of bankruptcy thereby reducing the risk of the lender (Claessens and Tzioumis, 2006). On the negative side, the private benefits of control tend to reinforce risk-shifting incentives once the firm is heading for financial distress.

Moreover, the question of accountability among SMEs to the public is non-existent since they (SMEs) do not depend on public funds. Most, especially the sole proprietorship

businesses do not necessarily need to comply with any disclosure. As a result, most SMEs don't keep records or prepare financial statement, all of which are crucial for business decision, performance of business and for accessing external finance. Therefore, governance structure of SMEs may have a greater impact on credit rationing. In addition, a firm's legal form may also reflect the entrepreneur's assessment of the riskiness of the projects undertaken (Cole, 1998).

Mygind *et al.* (2009) examined the importance of ownership structure for both investment behaviour and the likelihood of facing financial constraints. The results reveal that firms whose ownership structures are dominated by insiders face higher probability of being financially constrained and display higher sensitivity to availability of internal finance. Moreover, ownership structure was found to influence investment beyond its indirect effects through financial constraints. A study by Chackhraborty and Mallik (2012) reveals that corporations experience a greater credit gap than proprietary and partnership businesses. Drakos and Giannakopoulos (2011) reveal that credit rationing depends on ownership type.

2.4.4 Industry

Furthermore, sectoral heterogeneity affects credit rationing mechanism in a substantial way since banks often use industry classification to assess credit quality of the borrower. As Myers (1984) suggests, the industry in which a firm operates does not directly determine its capital structure but may do so indirectly via the nature and composition of the firm's assets. Chakraborty and Mallick (2012) found, the magnitude of credit gap varies considerably across industries with manufacturing firms facing an average credit gap of 46 percent, while the credit gap for services and wholesale firms being estimated at 23 and 27 percent, respectively. Abor (2007) revealed that SMEs in the agricultural sector

exhibit the highest capital structure and asset structure or collateral value; while the wholesale and retail trade industry has the lowest debt ratio and asset structure. Therefore, it is expected that industry impacts positively on access to the bank finance.

2.4.5 Geographical distance

Distance is an important factor in loaning decisions of the banks. Proximity could imply that bank has general knowledge about the local market on which the potential borrowing firm operates (De Young *et al.*, 2008). The degree of information asymmetry due to information being neither costless for the bank nor perfect is lower in the vicinity of the bank (Jimenez *et al.*, 2009). This implies that in the generalization of geographical credit rationing, the higher the distance of the firms the more difficult it becomes in obtaining information relevant for screening and monitoring of the firms. Because of informational opacity of SMEs, geographical distance can be an important factor in SMEs lending. The costs of the banks in gathering and processing site specific information about the potential borrowers increase with an increase of distance (Petersen and Rajan, 2002); thus, distant banks will be less informed about local credit market conditions than the banks closer to the borrowers.

The collection of information usually requires a contact between a lender and a borrower and this can be facilitated by geographical proximity. Asymmetric information can increase with an increase in geographical distance because information for screening and monitoring a firm is more difficult to come by from far distant firms. For example, it may be difficult for a distant potential borrower to deposit her/his collection every day, which provides a clear picture of the firm's cash flow. Greater geographical distance between informational opaque firms and their bank lenders should increase both the cost of searching information for the bank and the cost of delivering information for the borrower.

Banks and borrowers will make few personal visits because of high travel expense, resulting in less accurate information about the firm, poorer credit assessment, hence, credit rationing. Since geographically close lenders would incur lower costs in gathering borrower's information, they would prefer to offer credit to borrowers who are close to the bank.

Moreover borrowers who are close to the bank will incur less cost in delivering information to the lender (e.g. every day deposit will be possible and which provide a clear picture of the firm's cash flow). Carling and Lundberg (2005) used data on corporate loan granted between 1994 and 2000 by the leading Swedish bank, and found no evidence of geographical credit rationing. Neither could they find any evidence which shows that asymmetric information increases with distance. De Young *et al.* (2008) used 1984-2001 data from small business finance administration in the US, and found that geographical distance was associated with higher default probabilities, suggesting that distance interferes with information collection.

Jimenez *et al.* (2009) examined the effect of organizational distance (i.e. the distance between the headquarters of the bank that grants a loan and the location of the borrower) on the use of collateral for business loans by the Spanish banks. The scholars (Jimenez *et al.*, 2009), found that the use of collateral is higher for the loans granted by local lenders than for the loans granted by distant lenders. They also revealed that the difference in the likelihood of collateral for the loans granted by local lenders relative to distant lenders is higher among older and larger firms than among younger and smaller ones.

2.4.6 Financial information

Financial documentation is necessary to be maintained by firms in order to have financial access from the banks. Banks consider financial documentation as an important factor, and if it (financial documentation) is not maintained by the firms then the bank itself does the projection of the future cash flows of SMEs. According to Kitindi, *et al.* (2007) creditors, banks and other lenders use financial information provided by the firms to analyse their (firms') present performance and predict future performance. Thus, information obtained from the financial statements acts as an indicator of borrower's future prospects and ability to service a loan. Hence, availability, quality, and reliability of accounting information can reduce information problems between the bank and the borrowers, and alleviate credit rationing as a result (Mancusi and Vezzulli, 2014). On the other hand, poor record keeping and accounting information make it difficult for financial institutions to evaluate the potential risks and returns (OECD, 2006), making them unwilling to lend money to SMEs. Unreliable financial plans and records, and poor record keeping have been cited as among the major causes of limited access to credit by SMEs in Tanzania (Temu, 1998; Olomi, 2009). Furthermore, as Olomi, (2009) points out, SMEs operators lack the appreciation of the need for keeping business and financial records, and that those who keep records have two sets of accounts, an informal and a formal one. These affect the quality and reliability of financial reports of SMEs.

Despite the importance of accounting practices in accessing bank loans, there is still lack of empirical evidence on firms' accounting practices and access to external funds. Drakos and Giannakopoulos (2011) did an investigation on whether the use of external audit and application of international accounting standard affect credit rationing. These scholars found out that the use of external audit or application of international accounting standard does not influence the probability of rationing. In another study, Hashi and Toci (2010)

found out that the use of international accounting standard reduces the probability of rationing.

Drakos and Giannakopoulos (2011) and Hashi and Toci (2010) indicate whether a firm has used international accounting standard or external audit. These measures depend on the auditor's honesty in preparing these statements as well as the quality of the data provided by SMEs owners. Besides the aforementioned measures, this study examines accounting practices (preparation of financial statement, record keeping and depositing collection and the cost of preparing financial statement) of the firm and credit rationing. Frequency of depositing collection was seen as an appropriate measure because the bank project SMEs cash flows using both turnover of the bank account and cash flow presented by the financial statement. Likewise in case the financial records are not available, the bank uses turnover of the bank account.

Frequency of preparation of financial statement was also seen as an essential factor in accessing loan from the banks. This is because frequency of preparation of financial statements enables the effective use of financial statement in making business decision which is a key to SMEs success; this is also an important factor in accessing a bank credit. Thus, generation and effective use of financial information are the determinants of credit rationing. Given that the preparation of financial statement is costly, the firms may also be constrained by the cost of preparing financial statement. Thus, the firms that choose to do so actually send a quality signal to potential lenders.

2.4.7 Borrower knowledge on bank requirements and business project

Borrower understanding of the bank requirements in obtaining credit is essential in accessing a bank credit. This is because it (the borrower understanding of the bank

requirements) will ensure delivery of information to the bank. Quality and quantity of information available to the bank is also essential in accessing credit. The flow of information implies that both parties will have better understanding of each other (Ennew and Binks, 1997). Commercial banks require a sound business plan and a recorded business history. However, as noted by Olomi (2009), SMEs operators lack the appreciation of the need for keeping business and financial records or asking for professional accountants to do so. And as noted earlier, those who keep records have two set of accounts, the one which is informal and another one which is formal. This implies that most SMEs do not understand bank requirements and procedure. To ensure adequate flow of information is essential for the borrowers to understand the information needed by the banks and the importance of that information in accessing a bank credit. Japelli (1990) noted that accurate credit information can have a greater predictive power for the performance of the firms than the data contained in the financial statements. Therefore, borrower understanding of the bank requirements and business project may have an impact on credit rationing. However, no study has been conducted to examine whether or not limited access to credit by SMEs is influenced by lack of understanding of the bank requirements and business project.

2.4.8 Gender, ethnicity and owner age

Literature indicates that gender, ethnicity, wealth and owner's age may lead to credit constraint. A study by Irwin and Scott (2010) found that women respondents found it easier to raise finance than was the case with men. The survey also confirmed ethnic minority businesses, particularly black owner-managers, had the greatest problem in raising finance. Muravyev *et al.* (2009) found that unlike male managed counterparts, female-managed firms are less likely to obtain a bank loan. Similarly, Mijid (2009) found that in the United States of America women firm owners have higher loan denial rates and

lower application rates than is the case with their male counterparts. However, Blanchflower *et al.* (2003) and Zimmerman-Treichel and Scott (2006) found no evidence that gender could affect credit rationing. In another study, Blanchard *et al.* (2008) found statistical significant evidence of substantial discrimination in loan approval against black owned and Hispanic-owned businesses.

On the other hand, Cavalluzzo and Wolken (2005, 2002) found that ethnicity, gender and personal wealth are associated with the probability of loan denial. On a similar vein, Fraser (2009) found that Black and Bangladeshi businesses, in particular, have been less successful in accessing bank loans than either whites or other ethnic minority groups. Similarly, age of the owner could be a good proxy for creditworthiness, since an older person will have a proven financial track record. OAYEC (2000) found that in Ontario, youth entrepreneurs have negative experience with the bank due to lack of business experience and track record.

Previous studies (Irwin and Scott, 2010; Fraser, 2009; Muravyev *et al.*, 2009; Mijid, 2009; Blanchard *et al.*, 2008; Zimmerman-Treichel and Scott, 2006; Cavalluzzo and Wolken, 2005, 2002 and OAYEC, 2000) have been carried out using data from US, UK, Canada, and Asia. This study uses Tanzania data to analyse the influence of gender, and age on credit rationing. A number of studies have documented large differences in loan denials and credit access between small firms owned by white men and small firms owned by others. The variable ethnicity measured as race of the owner, have been dropped in this study because only few non black Tanzanian have been identified in the sample of SMEs which applied for small and medium loan.

2.4.9 Managerial competence

The experience of the manager plays an important role in determining the future prospect of the SME. Managerial competencies as measured by education, managerial experience, and knowledge of the business influence SMEs credit rationing. Olomi (2009) argue that limited managerial capacity demonstrated by lack of formal planning, appraisal and reporting system and structures constrain access to finance by SMEs. Educational attainment provides lenders with a signal of quality when determining the validity of potential entrepreneurs as investment propositions (Bates, 1991; Astebro and Bernhardt, 2003; Carter *et al.*, 2003; Xu, 1998). Highly educated individuals are also more likely to identify sources of financial access, as well as being able to estimate the likelihood of receiving finance (Vos *et al.*, 2007).

The results of empirical studies on managerial competence and credit rationing are inconsistent. Krasniqi (2010) found a positive relationship between educational level and credit approval for Kosovan SMEs. Han (2008) found that education and experience have strong impact on the severity of financial problem faced by SMES in UK. Parker and Van Praag (2006) provide evidence that each additional year of schooling decreased the capital constraints by 1.18 percentage points for 461 Dutch start-ups. Irwin and Scott (2010) found that graduates had the least difficulties raising finance in UK. Unlike the aforesaid studies, Hartarska and Gonzalez-Vega (2006) found no empirical evidence on education and credit availability, while Rand (2007) found an opposite relationship, that is, a negative effect of education on credit availability for a sample of Vietnamese firms. Rand observed that, highly educated managers are more likely to anticipate a possible rejection, so they might belong to the fraction of discouraged borrowers. Baydas *et al.* (1994) conducted a survey among microenterprises in Ecuador in 1990 to test the effect of human capital on credit rationing. In addition to educational level, the professional experience

and the age of the manager were included. The results confirm the findings of Rand (2007): highly educated managers were more likely to be discouraged borrowers. When applying for loans, these managers also had a higher probability of being rationed. The study of Baydas *et al.* (1994) also shows that highly experienced entrepreneurs were more likely to be rationed or discouraged.

2.4.10 Relationship lending

Banking relationships also seem to alleviate credit rationing because the banks can more easily monitor and access information regarding borrowers' history and actions (Petersen and Rajan, 1994). Diamond (1991) argued that the borrowers (e.g., small firms with less established repayment histories and/or borrowers with poor credit ratings) that suffer from the most severe information asymmetries have much to gain from relationship lending. Previous empirical studies on the relationship lending found that relationship duration has an impact on loan rate, on the probability of using collateral, and on the credit availability (Elyasiani and Goldberg, 2004).

Petersen and Rajan (1994) examine the effect of relationship lending on the availability and cost of funds using a sample of small privately held firms in the US. They (Petersen and Rajan ibid) rely on the fact that credit constrained firms are willing to pay higher price to raise additional funds, and define those firms which borrow from non institutional lenders at abnormally higher rate as constrained in the bank loan market. They used the length of business relationship, measured in years, the number of financial services and the number of lenders as a measurement of relationship. Petersen and Rajan (ibid) found further that longer banking relationships, the number of financial services purchased from the lending bank, and the number of bank relationships enhance the availability of funds. They also found a reduction of the interest rate among those enterprises that work with

fewer institutions, although they didn't find a significant link between the duration, the scope of the relationship, and the price of the debt. Using the same data base, Berger and Udell (1995) found that for firms which maintain long relationship with the banks, the cost of borrowing on previously negotiated credit lines is smaller and collateral is less frequently required.

Cole (1998) examined the effect of the existence of a bank-firm relationship on the probability of being granted a loan using the US sample of small businesses, and found that financial intermediaries are more likely to extend credit as a source of financial services to firms with which they have a pre-existing relationship. However, the scholar found that relationship duration is not important. He also found that the likelihood of granting credit is inversely proportional to the number of credit entities with which the companies work.

Harhoff and Kaorting (1998) used survey data from German SMEs to examine the role of lending relationships in determining the costs, collateral requirements and the availability of credit. The proxies of strength of relationship used include duration, the number of lenders, and qualitative response in which firm managers indicate the extent to which they consider their bank relationship as being characterized by mutual trust. These scholars found that availability of credit is lower for firms with more lenders and that duration and trust are not significant. They also found that interest rate is not significantly affected by duration or the number of lenders, and it decreases with an increase in trust. Moreover, collateral requirements decrease with duration and trust but increase with the number of lenders. Similarly, Cosci and Meliciani's (2002), providing evidence from Italy, reveal that the number of bank relationships has a positive effect on credit availability but has no effect on interest rates.

In another study, Elsas and Krahnen (1998) used credit file data of 200 medium-sized German firms and found that long-term relationships increase credit availability. Similarly, Cardone *et al.* (2005) used a sample of 386 Spanish firms and found that relationship duration increases the availability of credit and maturity of debt, but has no effect on interest rates or collateral requirements. They further found that the number of bank relationships significantly and positively affects availability of credit: and that the number of financial products reduces interest rates and decreases collateral requirements. Han (2008) using a sample of 2500 SMEs in the UK found that relationship lending alleviates the severity of financial constraints perceived by SMEs. Kano *et al.* (2011), using Japanese data investigated how the relationship lending affects credit availability and loan contract terms and found that the relationship improves credit availability but are costly to the borrower with respect to credit terms.

The commonly used empirical measures of relationship lending are duration of relationship, scope, trust, and the number of financial institutions. In addition to the variable identified in the previous studies, this study introduced more variables namely: borrower's reputation and the number of loans with other financial institutions. Borrower reputation was measured in terms of the number of times the borrowers renewed credit. This measure was used in the previous studies to investigate the influence of reputation on the loan rate (Bodenhorn, 2003). Moreover, previous empirical studies have examined the effect of banking relationships on the loan contract term (interest rate and the probability of pledging collateral) and availability of credit for small and medium sized enterprises (SMEs) in the US and in Europe. Tanzania also offers a particularly rich environment to examine bank-borrower relationships given the fact that most SMEs have limited access to credit due to high information asymmetries.

2.4.11 Loan maturity

Time of maturity or loan duration has an impact on credit rationing. A long-term debt would be more often a constraint than a short-term loan. A long-term loan requires long-term judgments of the bank on the creditworthiness of the borrower. The company, which is creditworthy at the moment of credit decision, cannot be sure that it will remain credit worth in the future. The term of the loan gives the debtor enough opportunities to switch from low risk to high-risk project.

On the other hand, information gathered through their lending activity enables the banks to better evaluate borrowers whom they have dealt with in the past, relative to borrowers that are new and unknown to them. Engaging in short-term loans instead of long-term loans may also provide the lender with additional information and reduces the information opaqueness. As the term of the loan becomes shorter, the reputation effect of any risk shifting behaviour tends to be more important (Ortiz-Molina and Penas, 2008). Thus, granting short-term loans reduces the moral hazard problem. On the other hand, short-term loans can also be used as a signalling instrument (Flannery 1986); by entering into short term loans, the borrower allows the lender to generate information on the firm. This information can, throughout time, lead to a strong reputation of the borrower and will cause more favourable contractual conditions on future loans (Diamond, 1991). Hence, short-term loans minimize the adverse selection problem.

Martinnelli (1997) observed that firms may build reputation by good credit history. It is also revealed by Cole (1998) that lenders are more likely to extend credit if they have a pre-existing relationship with the borrower. Therefore, loan maturity may signal that the firm is trustworthy as it is proven to be trustworthy borrower who punctually pays interest rate and honours the terms of contract. The results of an empirical study by Ortiz-Molina

and Penas (2008) support the proposition that shorter loan maturities serve to mitigate problems associated with borrower risk and asymmetric information. Unlike the study by Ortiz-Molina and Penas (2008), this study analyzes the role of loan maturity in alleviating credit ration. Loan maturity was measured as the duration of loan maturity.

2.5 Credit rationing and SMEs growth

In perfect capital markets firms are indifferent between what sources they use (internal or external) to finance their investment (Hashi and Toci, 2010). They would not find it difficult to raise external finance when profitable investment opportunities arise and, in this framework, internal and external funds are perfect substitutes. However, given market imperfections, reliance on internal funds may be higher since raising external finance is either more costly or impossible (Hashi and Toci, 2010).

The access to and cost of finance is one of the factors that determine the ability of a firm to invest and grow (Binks and Ennew, 1996; Oliveira and Fortunato, 2006; Rahman, 2010). The literature on asymmetric information and agency problems highlights that credit rationing can hinder firms' investment (Angelini *et al.*, 1998). Similarly, the existence of credit rationing can have important effects on the firm's ability to grow and stay in the market (Musso and Schiavo, 2008). A firm with limited or no access to bank credit may be seriously constrained in its ability to pursue an optimal investment policy which, in turn, may hinder the firm's growth (Knyazeva *et al.*, 2009).

Ayyagari *et al.* (2008) found that finance, crime, and political instability directly affect the rate of growth of firms, with finance being the most robust variable affecting firms' growth rate. Likewise, empirical evidence suggests that limited access to bank finance is a

major obstacle to SMEs growth (Bartlett and Bukvic, 2001; Mambula, 2002; Giovanni and Leonardo, 2002; Beck *et al.*, 2006; Blandina and Adelino, 2006; Tiwari *et al.*, 2007).

Beck *et al.* (2005) found that firms that report lower growth rates face greater finance constraints. Evidence also suggests that firms that face finance constraints are less likely to invest in fixed capital (Ojha *et al.*, 2010). Carpenter and Petersen (2002) show that in the presence of credit rationing and collateral requirements, a firm's finance constraint is binding when an extra dollar of investment increases the asset value by more than one dollar. Their regressions of asset growth on finance estimated a coefficient in excess of one. The marginal returns to investment were positive and so the authors concluded that for most SMEs, growth is constrained by a lack of finance.

Banerjee and Duflo (2004) analyzed detailed loan information on 253 Indian SMEs' before and after they became eligible for a directed subsidized lending program and find that the additional credit resulted in a proportional increase in sales reflecting its impact on growth. Similarly, Zia (2007) finds that small non listed and non group firms in Pakistan reduce their sales after they become ineligible for subsidized export credit, indicating the existence of credit constraints; in contrast, large, listed and group firms do not reduce their sales after losing access to subsidized credit. Musso and Schiavo (2008) found that access to external financial resources has a positive effect on the growth of firms in terms of sales, capital stock and employment. Cabral and Mata (2003) argue that in the presence of finance constraints the longrun size distribution of firms is skewed significantly towards small firms. They further argue that when financing constraints cease to be binding, the small firms will grow to their optimal size.

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Despite the fact that previous literature shows that limited access to bank finance is a major obstacle to SMEs growth, credit rationed SMEs may use other sources of finance to overcome the problem of limited access to credit from financial institutions. The only other economically significant source of external funding for SMEs is trade credit, even though it is generally considered to be more costly than bank loans (Petersen and Rajan, 1994, 1995). A common consensus exists that trade credit is most common among firms that face credit constraints (Fabbri and Menichini, 2010).

Trade credit is for many SMEs the only substitute for bank finance (Petersen and Rajan 1994, 1995, 1997; Cunat, 2007; Yang, 2011). Other alternative equity sources of finance are mostly not available for small (Tanzania) firms. Financing theory links the use of trade credit to the existence of asymmetrical information causing credit rationing by financial institutions towards certain (considered risky) firms (Meltezer, 1960; Petersen and Rajan, 1994; Wilner, 2000). This excess demand for bank debt can be compensated by the use of trade credit. Suppliers ask for higher implicit interest rates in order to grant trade credit (Wilner, 2000). Thus, trade credit can be a substitute for the insufficient bank finance they received, as was empirically confirmed by Antanasova and Wilson (2004), Danielson and Scott (2004) and Nilsen (2002).

The results of empirical studies by Petersen and Rajan (1994, 1995) and Biais and Gollier (1997) also suggest that certain categories of SMEs that have a lower probability of being credit rationed appear to be less appealing to trade credit. Furthermore, several studies (e.g. Åstebro and Bernhard 2003; Cunat, 2007; Tsuruta, 2008, Saeed, 2009) report empirical evidence for a relationship between firm growth rates and the use of trade credit.

Because of the fact that rationed SMEs may rely on non bank source of finance such as trade credit and loans from friends and families to overcome credit rationing, it may be the case that credit rationing does not affect a firm's growth. Therefore, we expect that if bank loans and other forms of external financing are not perfect substitutes at the firm level, credit rationing may result into a financing deficit. The existence of credit rationing can obviously have important effects on the firm's ability to invest and grow and stay in the market.

2.5.1 Measuring SMEs growth

Growth refers to a change in size or magnitude from one period of time to another (Wiklund *et al.*, 2009). There is no consensus on the appropriate measures of the growth of SMEs and, as a result, researchers are free to choose one best indicator, create a multiple indicator index or use alternative measures separately (Shepherd and Wiklund, 2009). Delmar *et al.* (2003) analysed different measures and conclude that firm growth can be expressed by different measures depends on the purpose of investigation and subject of data.

The growth of SMEs can be measured by using various indicators such as sales, employment, assets, profit, market share, productivity and value of production, added value of production, financial or stock market value (Shepherd and Wiklund, 2009; Delmar *et al.*, 2003). Among these measures, sales and employment were the most frequently used in empirical analysis (Wiklund *et al.*, 2009; Jansen, 2009). Sometimes asset growth is used as growth indicator. However, measuring growth in assets may be problematic for measuring firm size in industries where intangible assets are important for the process of economic growth and where firms in the sample have very deferent capital intensities (Shepherd and Wiklund, 2009).

Sales is the most general of the alternatives measures, as all commercial firms need to have sales to survive. According to Delmar *et al.* (2003) it is also the indicator small firm owner managers use themselves in making business decisions. In addition, sales often precede the other indicators because an increase in sales necessitates increases in assets and employees, and results in rising profits or market share (Shepherd and Wiklund, 2009). Similarly, employment is considered as an important measure because most of the studies on government policy measure growth in terms of employment (Shepherd and Wiklund, 2009). Moreover, firm level employment is careful followed and recorded over time and less subject to accounting manipulation (Rahman, 2011). Delmar *et al.* (2003) argue, because of unavailability of SMEs data, most empirical studies use sales and employment growth as a measure of a firm's growth. Therefore by taking all this into consideration, a firm's growth in this study is defined as change in the number of sales and a change in the number of employees.

2.6 Existing gaps in the empirical studies

Despite the theoretical and empirical efforts of trying to explain the causes of credit rationing and counteracting measures used by the bank to alleviate information problems hence credit rationing, little has been done to analyse the magnitude of credit rationing, causes of credit rationing and the effect of credit rationing on the firms' growth. In order to assess the validity of credit rationing to see if it is a significant problem to SMEs, it is crucial to assess the effect of credit rationing on SMEs growth. Therefore, this study analyses the magnitude, causes and consequences of credit rationing on a firm's growth.

The determinants of credit rationing have been identified using data at a firm level. These studies have advanced our understanding on the demand side of SMEs credit rationing, little data exist on the supply side perception. A comprehensive survey to examine obstacles to credit as perceived by providers of funds (commercial banks) and SMEs could

help to further confirm the findings of previous studies. Therefore, this study collects data from both credit officers and SMEs owner managers.

The previous empirical studies, which analysed the determinants of credit rationing, have done little to analyse the influence of entrepreneur characteristics on credit rationing. Few studies analysed the role of gender, education, experience and personal wealth (Krasniqi 2010; Irwin and Scott, 2010; Fraser, 2009; Muravyev *et al.*, 2009; Mijid, 2009; Han 20008). Other factors such as owner age, knowledge on bank requirements and business project have not yet been explored. Likewise, the costs incurred by borrowers in the preparation of loan requests have not been explored. These factors are very crucial in accessing bank credit. These variables are included in the current study.

Moreover to date, there is lack of empirical evidence concerning accounting practices and credit rationing. Previous studies investigated whether or not the presence of hard information, the use of external audit, and application of accounting standards are relevant in granting credit to SMEs. These studies did not take into consideration accounting practices of the firm; they (the studies) only based on the last prepared statements rather than on the reliability and accuracy of the source of the data. These variables are very important since they affect the quality of available information for the commercial bank. Therefore as part of business characteristics, this study examines accounting practices of the firm- record keeping, preparation of financial statement and disclosure (banking collection) - and credit rationing.

Additionally, little is known on the combined effect of information asymmetry and transaction cost proxies on bank's credit rationing. Therefore, this study examines the

influence of information asymmetry and transaction costs on SMEs credit rationing by developing information asymmetry and transaction cost indices.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research design

There are various research designs whose application depend on the purpose or objective of the research, nature of the problem to be studied, available data sources, and availability of time and money for the research work. In terms of the methodological approach chosen, this study used a cross-sectional design, with quantitative and qualitative data being collected at a single point in time. The following are the reasons for selecting cross sectional design: Firstly, the objective and nature of the research problem allow the researcher to collect data on variables at one point in time. Secondly, the research was bound with time limit and budget constraints. The argument for choosing survey was twofold. Firstly, surveys provide quick, efficient and accurate means of assessing information about the population. Secondly, surveys are more appropriate in cases where there is lack of secondary data.

3.1.1 Area of the study

T he study was carried out in Dar es Salaam city and Morogoro municipally. Dar es Salaam is the largest commercial city in Tanzania with an estimated population of 3 million people. Dar es Salaam city is found in the Dar es Salaam region which consists of three administrative districts namely Kinondoni to the north, Ilala in the centre of the region, and Temeke to the south. Dar es Salaam is located at 6°48' south, 39°17' East 6.8000, 39.2833 (URT, 2009b). The city is situated on a massive natural harbour on the Eastern coast of Africa. The city is favoured for having much of the Tanzania economic infrastructure and almost all ministry headquarters are located in this city. Being the prominent region, the city contains high concentrations of trade and other services

compared to other parts of Tanzania. Major economic activities carried out in this city include manufacturing, trade, financial services, education and training, transportation and construction (URT 2008). The reasons for choosing Dar es Salaam are as follows. First, Dar es Salaam is the largest commercial city where most of the SMEs are located. Second, the selected banks have many branches in Dar es Salaam than any other region (BOT, 2010c). Therefore, the possibility of getting representative sample was high in this region.

Morogoro Municipality is the capital of the Morogoro Region, located in the southern highlands of Tanzania, 192 km west of Dar es Salaam, lying at the base of Mount Uluguru, and has a population of 1.8 million people (URT 2009b). The region comprises six administrative districts, namely Morogoro town, Morogoro rural, Kilosa, Mvomero, Ulanga, and Kilombero. The region was commonly known as an industrial region during the African socialism era because most of the industries in Tanzania were located in this region. Nowadays, most of these industries have been privatised and are now owned by individual people. Morogoro is a town connecting the country's commercial city of Dar es Salaam with the centrally located country capital city of Dodoma and the southern highland town of Iringa. Morogoro was selected because of its strategic location..

3.1.2 Population and unit of analysis

The population for this study included both SMEs owner-manager and bank credit officers. Due to limitations of time and funds, the unit of analysis in this research could not cover all SMEs owner-managers and all bank credit officers in Tanzania. Moreover, this research was not designed to study all SMEs owner managers and bank credit officers in Tanzania; instead it was only designed to study credit rationing for SMEs regarding the commercial bank loans and the impact of credit rationing on SMEs growth. The unit of analysis for the study includes SMEs owner managers who applied for business loan from

three major commercial banks in the country; and the bank credit officers who deal with SMEs from those three major commercial banks in the country.

3.1.3 Sampling procedure

SMEs sample selection: This study used concurrent mixed method sampling to select a sample of SMEs owners who applied for business loan from three major commercial banks in the country. Concurrent mixed method sampling utilized a single sample generated through the joint use of probability and purposive techniques to generate both the quantitative and qualitative data (Teddlie and Yu, 2007). This occurs when a sample of participants responds to a mixed method survey that contains both closed-ended and open-ended questions (Teddlie and Yu 2007).

Purposive sampling was used to select SMEs because of the following reasons: First, SMEs are more likely to suffer information problems in the capital markets. Second, SMEs are typically restricted to obtain external finance only from financial institutions. Public debt markets are only accessible for large firms. Fourthly, SMEs are extremely important for the Tanzania economy.

Purposive sampling was also used to select SMEs owners' managers from three major commercial banks in the country. The approach was adopted because SMEs owner managers possess information that the researcher intends to gather. The study concentrated on three major banks in the country based on their systematic importance and significance as potential SMEs financier. This is due to the fact that these are the ones with the most extensive branch network in the country and, hence most accessible to SMEs at least in terms of location. Therefore, SMEs owner managers from these banks are viewed as the best representative of the population. Further, probability sampling (simple

random sampling) was used to select SMEs owner managers who applied for business loan from three major commercial banks to constitute the sample. Other better sampling techniques such as proportionate stratified sampling would not be appropriate since most variables in the research are appropriate strata.

Credit officers sample selection: Purposive sampling was used to select credit officers from three major commercial banks in the country. Purposive sampling was used because credit officers are the ones who deal with SMEs loan requests. Therefore credit officers are in a better position to provide information on factors constraining credit flow from commercial bank to SMEs.

3.1.4 Sampling frame

The selection of a sampling frame was the next step after determining the unit of analysis. The sampling frame for SMEs owner managers was the lists of credit applicants from three banks. The lists were developed by credit officers and provided to the researcher. The list contained information about names of business owners and telephone numbers. There were no sampling frames for the credit officers from the three commercial banks. Therefore credit officers were randomly selected based on their availability and willingness to share information.

3.1.5 Sample size

Since this study used regression analysis, the sample size was largely dependent on multivariate analysis requirements. One of the important requirements of this analysis is that it requires a sample whose size should preferably be 100 or larger (*Hair et al.*, 2005). A sample size of 271 SMEs was used in the study. The distribution of the sample across the two regions and three commercial banks is shown in Table 2.

Table 2: Distribution of SMEs sampled in Dar es Salaam and Morogoro region

	Dar es Salaam	Morogoro	Total	Percentage
Bank A	51	25	76	28.0
Bank B	72	23	35.1	
Bank C	67	33	100	36.9
	190	81	271	100
	70.1	29.9	100	

Moreover a sample of 28 credit officers who deal with SMEs were selected and the final sample consisted of 271 SMEs and 28 credit officers.

3.2 Data collection

This section discusses how relevant data were collected in order to address the objective of the study. The study used both qualitative and quantitative data. The qualitative data were deemed appropriate because the phenomenon of credit rationing with respect to SMEs is under researched in Tanzania. Therefore, qualitative data are essential to uncover underlying themes of knowledge about the phenomenon. Further quantitative information was needed to measure the perceived extent of the credit access and constraints and the impact of credit rationing on a firm's growth.

3.2.1 Data source

In terms of data sources, there are two main sources of data: primary data and secondary data. Primary data are the data gathered and assembled specifically for the project at hand. Secondary data are the data gathered and recorded by someone else prior to the current needs of the researchers. Secondary data are usually historical, already assembled, and do not require access to the respondents or subjects. This study used primary data. In

Tanzania, there is no any data source for collecting data that reflect the variables of credit access and constraints as well as the impact of credit rationing on the growth of SMEs. Commercial banks could provide information about their customers; however due to confidentiality agreement between them and their clients it was not possible for these banks to allow the researcher to have access to their clients' files. In this case, primary data source was viewed as an appropriate source.

3.2.2 Data collection technique

In terms of research technique, this research used survey. Survey is a research technique in which information is gathered from a sample of people using a questionnaire. The choice of a survey was based on two major reasons. Firstly, survey provides a quick, efficient and accurate means of assessing information about the population. Secondly, survey is more appropriate where there is a lack of secondary data. In this case, there is no data set available in Tanzania, which enables the researcher to investigate credit rationing for SMEs in Tanzania and its impact on SMEs growth; thus, conducting a survey to gain information on credit rationing and SMEs growth was necessary. Surveys may be further classified by the communication medium used into mail, telephone survey and personal interview (Emory, 1985).

In Tanzania, there are difficulties in collecting data especially data regarding business information particularly financial information. Therefore, the selection of appropriate methods to collect information from the respondents was very important in the survey. This selection may be based on; the possibility of communicating with the respondents, the advantages and disadvantages of the most usual surveys and the budget allocated for the research. Each of the survey methods (personal interview, telephone interview and mail survey) has both advantages and disadvantages in terms of different perspectives.

However, item non-response, the possibility for respondent misunderstanding the question, and cooperation of the respondent or participation are probably the most important factors for the success of a survey. Therefore, this study used personal interview as a technique of obtaining information from SMEs owners or managers and credit officers.

The selection of personal interview as opposed to other survey methods as a means of communicating with the respondents in this study is based on the following advantages First, social interaction between the interviewer and the respondent increases the likelihood of getting the responses for all the items in the questionnaire. As a result, non-response is the lowest for personal interview. Secondly, a possibility for the respondent misunderstanding the question is low. Personal interview provides an opportunity to the researcher of probing on diverse issues. If a respondent's answer is brief or unclear, the interviewer may be able to probe for a clearer or more comprehensive explanation. As a result, the possibility for respondent misunderstanding the questions is lowest.

3.2.3 Questionnaire

The quantitative and qualitative data were collected through personal interview using two sets of questionnaires, one for the loan officers and another for the SME borrower. The design of questionnaire was drawn from literature review, previous empirical studies and primary interview with credit officers and SMEs owner-managers. In preparing the questionnaire, the researcher tried to capture all the aspects shown in the conceptual framework. Questionnaires with detailed questions of both close ended and open ended questions were used to collect data from credit officers and borrowers. Open ended questions seeking views of the respondents were used to enrich the questionnaire. Teddlie and Yu (2007) emphasizes balancing structured and unstructured means of data collection

within the same instrument or within a study. The author argues that mixed method research provides a more comprehensive empirical record than other types of research, particularly when the investigators create tools that incorporate multiple methods (that is, hybrid tools, rather than different tools for collecting different types of data).

SMEs questionnaire was designed to solicit information from four broad areas. The first part covered rationing status of SMEs in terms of: identifying applicants who are rejected, partially rationed and none rationed; the reasons for being rejected or partially rationed; and the amount of loan they are willing to borrow and the amount of loan they received. The second part consisted of the questions aimed at soliciting information on entrepreneurs' characteristics which influence credit rationing. The third part consisted of questions which were to provide information on firm specific characters (i.e. intrinsic to their nature and their behaviour) that constrain them from accessing bank credit and firm employment and sales data. This is followed by part four, which covered information about loan characteristics.

For credit officers, a tabulated questionnaire and detailed data set were used. The use of tabulated questionnaire and detailed data were designed to provide information on reasons constraining credit officers' from supplying adequate credit to SMEs. The interviews and data processing are confidential, so credit officers and SMEs owner/managers practically had no restraint in sharing their information with the understanding that the data would be reported in aggregate format without disclosing individual banks, credit officers or borrowers.

When questionnaires had been drawn up, they were sent to a group of credit officers and borrowers for comments which were then incorporated before the final instrument were

prepared. This is in addition to the fact that the questions which were derived from the primary interviews with loan officers and borrowers were intended to increase the reliability and validity in capturing the desired information. After incorporating the comments on the questionnaires instruments, a pilot study of 9 credit officers and 30 SMEs owner managers was conducted to determine whether or not the questions were easily understood by the respondents.

3.3 Validity and reliability

In this study, validity and reliability were ensured by using a statistician and a panel of experts to evaluate the research instrument for conceptual clarity, pre-testing the research instrument in a pilot study and comprehensively reviewing the literature. This is in addition to the fact that the questions were derived from the primary interviews of loan officers and borrowers. Since the questions were derived from the responses of credit officers and SMEs owner managers in the primary interview, the resulting questionnaires were deemed to reflect their views. Moreover, most of the measures used in this study were drawn from previous research and had been proven to be reliable. This was to make sure that what was measured is what was intended to be measured. In addition, Cronbach's Alpha was used to measure internal reliability (Hair et al. 2006). The measure has a coefficient ranging from 1 to 0; a value of 0.7 or less generally indicates unsatisfactory internal reliability.

3.4 Data requirements and variables definition

In order to achieve the objectives of the study and to test the study hypotheses, the researcher needed information about the firm and the entrepreneur's characteristics, loan characteristics, sales, employment, rationing status as well as demand and supply figures. Many of the variables proposed have been used in other studies on SMEs credit rationing

(reviewed in chapter two) and no further justification will therefore be provided for their inclusion. However, this study also includes variables, which to our knowledge have not been included elsewhere. Justification for their inclusion is provided in Chapter One, Section 1.2. These variables are defined below.

3.4.1 Credit rationing

Following Jappeli (1990) and Chakrabort and Mallick (2012), this study used direct measure of credit rationing. The bank applicants were asked as to whether they would have liked to borrow more at the same interest rate during their most recent loan application. If the response was positive, it was taken as evidence for an excess demand, and the respondents were classified as being rationed. Based on the answers to this question, the rationed SMEs were assigned 1 and the non rationed SMEs were assigned 0.

3.4.2 Extent of rationing

To measure the extent of rationing, the respondents were asked to specify the amount of loan they would be willing to borrow and the amount of loan they would receive. This information was used to measure the extent of rationing as the percentage difference between the amount of credit demanded and the amount of credit received.

3.4.3 Entrepreneur characteristics

The study included specific entrepreneur attributes related to informational asymmetries and transaction costs, that expected to affect credit rationing. Table 3 shows the details of how these variables were operationalised.

Table 3: Showing entrepreneur characteristics expected to affect credit rationing

Sex	Dummy variables indicating female ownership and male owned is the reference group
Age	Entrepreneur age in categories "35 year or less", "above 35 to 50 years" "above 50 years" is the reference
Managerial experience	
Education	Dummy variable indicating highest level of education: "primary", "secondary education)" "higher education" is the reference
Experience	Number of years in running similar type of business
Knowledge on lending condition	Dummy indicating whether owner manager knows all information required by bank before consulting the bank for credit.
Detail study of business plan	Dummy indicating whether owner manager make detailed study of business project or not
Knowledge on preparation of business plan	Dummy indicating whether the owner manager lack knowledge of preparing business plan
Cost of preparing business plan	Dummy indicating whether owner manager is constrained by costs of preparing business plan
Relationship with Banks	
Duration	Number of years with the bank
Financial Institution	Number of financial institution with bank
Outstanding loan	Number of outstanding loan with other financial institution
Financial product	Number of financial product with the bank

3.4.4 Firm characteristics

The study included specific business attributes related to informational asymmetries and transaction costs, and therefore expected to affect credit rationing. Table 4 shows the details of how these variables were operationalised.

Table 4: Showing firm characteristics expected to affect credit rationing

Age	Dummy variable indicating business age "less than 2 years" "above 2-5 years" "above 5-7 years" and "above 7 years" is reference category
Size	
Number of employees	Dummy variable indicating "1-4 employees" "5-49 employees" as reference category
Capital investment	Dummy variable indicating capital investment "5-100million" "above100-200million" "above 200million" as reference category.
Industry	Categorical variables indicating broad industry sectors; "construction", "trade", with "service", "manufacturing" as the reference group
Distance	Dummy indicating distances in kilometres; "less than 5 km" "above 5-10 km" "above 10km" is reference category
Governance	
Ownership	Dummy variable, where 1 indicates sole proprietorship; 2 otherwise
Family ownership	Dummy variable, where 1 representing the involvement of family members in both ownership and management 2 otherwise
Control and major decision	Dummy variable, where 1 indicates control and major decision is done by one person, 2 otherwise
Accounting practices	
Record keeping	Dummy variable, where 1 indicates whether the firm keeps records of all receipt and payments; 2 otherwise
Preparation of financial statements	Categorical variable indicating whether business prepares financial statement; "never" "sometimes" "always" as reference category
Banking collection	Categorical, indicating whether business bank collection, "never" "sometimes" "always" as reference category
Collateral	Dummy indicating the amount of collateral offered as the percentage of loan desired "less than 150" "more than 150" as reference category

3.4.5 Loan characteristics

Two variables were used to measure loan characteristics; loan amount and duration of loan maturity. Loan amount was measured as the amount of loan the borrowers were willing to borrow. Loan maturity was measured as duration of loan maturity; binary dummy variable, where 1 indicates duration of one year or less, 0 otherwise.

3.4.6 Information asymmetry and transaction

Information asymmetry and transaction costs were measured using information asymmetry and transaction costs indices. Table 5 shows the details of how these variables were operationalised.

Table 5: Information asymmetry and transaction costs indices used to measure information asymmetry and transaction costs

Index	Definition	Expected Sign
AIINDX	Sum of ranking scores across proxies used to measure information asymmetry (table 6).	+
TCINDX	Sum of ranking scores across proxies used to measure transaction costs(table 7)	+

3.4.6.1 Construction of AIINDX and TCINDX

In order to construct information asymmetry index, denoted as AINDX we used the proxies used in the previous studies to measure information asymmetry and proxies suggested by the researcher. These measures are owner's age, business age accounting practices- preparation of financial statement, banking collection- knowledge on lending requirements and business project and preparation of systematic business plan, banking relationship-duration, credit history (reputation), and outstanding loan with other financial institutions.

We first transform information asymmetry proxies from their original measures (Tables 3 and 4) to form dummy variables with two categories indicating low information asymmetry (1) and high information asymmetry (2) (see table 6). A highest score (20) indicates a higher degree of information asymmetry and lowest score (10) indicate lowest degree of information asymmetry. Ten measures were used to form an index of information asymmetry.

We assumed that the degree of information asymmetry will be high for young borrowers with less than 35 years, young firms with less than 7 years, first loan applicants and firms which have been with the bank for less than 3 years, firms which do not always prepare financial statement and deposit business receipts, firms with outstanding loan with other financial institutions, borrowers who lack knowledge on lending requirements and business plan preparation and borrowers who do not carry out detailed study of business projects. Then AIINDX was calculated by adding the values of the asymmetric information proxies.

Table 6: AIINDX measures

Measure	All are dummy take value of 1(low information asymmetry) 2 (high information asymmetry)
Owner age	1 more than 35 years 2 less than 35 years
Business age	1 more than 7 years in business 2 less than 7 years
Preparation of Financial statements	1 always prepare financial statement for business purpose 2 otherwise
Bank collection	1 always deposit receipt and payments 2 otherwise
Lack knowledge to understand business plan	1 No 2 yes
Make detail study of business project	1 yes, 2 No
Lack knowledge on lending requirements	1 No, 2 Yes
Relationship: Reputation	1 Previous borrower 2 first loan applicant
Relationship: Duration	1 More than 3 years 2 less than 3 years
Relationship: Outstanding loan	1 No 2 Yes

Transaction costs index was developed by the same approach used to develop information asymmetry index, denoted as TCINDEX. Three measures were used; firm size, geographical distance and the cost of preparing loan request. The highest score is 6 for firms with higher transaction costs and 3 for firms with low transaction costs. We assumed that transaction costs will be high for small firms, firms which are located 10 km from the

bank and borrowers who are constrained with cost of preparing loan requests (see table 7). Then TCINDX was calculated by adding the values of the transaction cost proxies.

Table 7: TCINDX measures

Variables	All are dummy take value of 1 (low information asymmetry) 2 (high information asymmetry)
Size	1 more than 200, 2 less than 200 million
Distance	1 less than 10km from bank 2 more than 10km from bank
Cost of preparing loan request	1 does not constrain by cost of preparing loan request 2 otherwise

After developing AIINDX AND TCINDX indices we ran correlation to correlate each individual item in the indices with the score of composite indices to determine, or establish association between them. All variables were significant (see Tables 32 and 35 Chapter 4). Cronbach's Alpha (α) was also performed to measure AIINDX AND TCIDX indices reliability. The value of Alpha generally ranges from zero to one. A score of at least 0.7 is generally considered acceptable for creating an index. Both AIINDX and TCINDX scored above 0.7 (see Tables 8 and 9 below).

Table 8: Reliability statistics of AIINDX

Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
.747	.851	11

Table 9: Reliability Statistics of TCINDX

Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
.740	.726	4

3.4.7 SMEs growth

Growth can be measured on the basis of several attributes such as sales, employment, assets, profit, market share, and productivity. Shepherd and Wiklund (2009) reviewed studies on firm growth and found sales to be the most prevalent indicator, followed by employment. Therefore, in this study, SMEs growth is defined in terms of a change in the amount of sales and a change in the number of employees. However as noted earlier, many of the owner-managers of SMEs do not keep proper accounting records and when they do, they are often not prepared to disclose them to a third party. To counter this problem, general measures were used to obtain information regarding growth in sales. The respondents were asked to rate their firms' performance on a scale from 1 to 3 in relation to whether their firms' sales had decreased, remained the same or increased since they receive or denied credit. Further, to obtain employment growth data, the respondents were asked whether or not the number of employees had decreased, remained the same, or increased since received or denied credit.

3.5 Data analysis

This study was designed as a combination of descriptive and hypothesis testing. The data analysis involved three main phases, namely: data preparation, descriptive analysis and hypothesis testing. Data preparation took place soon after the completion of the field work, from which all 299 questionnaires; 271 from SMEs owners and 28 credit officers were entered in the computer using SPSS software. Thereafter, descriptive statistics and

hypothesis testing were performed. The section below details how these approaches were employed in this study.

3.5.1 Descriptive analysis

Descriptive statistics was applied before hypothesis testing to point out what variables are worth testing quantitatively. Descriptive statistics were applied to investigate and describe business, entrepreneur, and loans characteristics according to their rationing status. Also descriptive statistics was applied to investigate factors constraining credit officers from supplying adequate credit to SMEs. In this study, the following statistical techniques were used as tools of descriptive analysis:

(i) Calculation of averages, frequency distribution and percentage distribution used as a form of summarizing data

(ii) Cross-tabulation was used to allow the inspection of differences and to make comparisons between two groups of SMEs, rationed and none rationed SMEs.

(iii) Chi square was used to test for association between the non-metric business and entrepreneur characteristics variables and rationing status. Business and entrepreneur characteristics which appear to be significant were included in binary logistic regression.

(iv) OLAP cubes was used to allow the inspection of means differences of the extent of rationing and to make comparisons of the extent of rationing across gender, size, industry, loan maturity and governance structure.

3.5.2 ANOVA

This study was concerned with examining whether the extent of rationing varies across sex of the owner, owner's age, firm's age, industry, firm size, governance structure and loan maturity. Analysis of Variance (ANOVA) was performed in order to examine

whether the extent of rationing varies across gender, owner and business age, business size, governance structure, loan and loan maturity. This study was also concerned with examining whether sales and employment growth of rationed SMEs is different from that of non rationed SMEs. ANOVA was performed to examine the effect of credit rationing on sales growth and the effect of credit rationing on employment growth.

3.5.3 Logistic regression

Logistic regression was used to examine the influence of firm and entrepreneur characteristics on credit rationing. Logistic regression determines the impact of multiple independent variables presented simultaneously to predict membership of one or other of the two dependent variable categories (*Hair et al.* 2005). The dependent variable in this study is categorical, in terms of whether the firm is rationed or otherwise. The independent variables are firm and entrepreneur characteristics which appear to be significant in cross tabulation result.

$$P(Y) = \frac{exp\,(\alpha + \beta_1 \chi_1 + \cdots + \beta_n \chi_n + \varepsilon)}{1 + exp\,(\alpha + \beta_1 \chi_1 + \cdots + \beta_n \chi_n + \varepsilon)} \quad \text{.....(1)}$$

P(Y) is a latent variable denoting credit rationing. We observe *P(Y)*, which is a dichotomous (1, 0) variable indicating whether the respondent falls into the credit-rationed subgroup or not.

α = an intercept.

X_1-Xn= coefficients of independent variable. The variable expected outcomes are explained below:

Business age: degree of information asymmetry expected to be is high for young firms with relatively short observable history. Therefore, the probability of rationing is accepted to be higher for younger firm than it is for older firms.

Size: Probability of rationing is higher for small firms than is the case for medium firms because the assessment and monitoring costs of small loan increases as the loan size decreases.

Collateral: reduces the probability of rationing because; it can solve problems derived from asymmetries in the valuation of projects.

Banking relationship: reduces the probability of credit rationing because the banks can more easily monitor and access information regarding borrowers' history and actions and reduce information asymmetry.

Owner age: increase probability of rationing: because young borrowers and young managers control less resources, have little experience, have low reputation and responsibility and thus leading to high information asymmetry.

Geographical distance: increases the probability of rationing because information asymmetry and costs of the banks in gathering and processing site-specific information about the potential borrowers increase with an increase of distance.

Accounting practices: information asymmetry is high for firms with poor accounting practices; since the banks use financial information provided by the firms to analyse their

present performance and predict future performance. Therefore, poor accounting practices increase the probability of rationing.

Industry: affects the credit rationing since the banks often use industry classification to assess borrowers' credit quality.

Incorporation: can reduce the probability of rationing compared to sole proprietorship because it is a good signal that portrays credibility and formality of operations and accountability among owners and reduce information asymmetry.

Borrowers who are constrained by cost of preparing business plan: expected to be credit rationed since good business plan is perceived as one of the most essential documents to be prepared by the SME.

Knowledge of business project: enables the entrepreneur to show confidence on viability of their business plan and financial information and alleviate information asymmetry. Therefore, knowledge of the business project is expected to decrease the probability of rationing.

Knowledge of the bank requirements: ensures quality and quantity of information available to the bank hence reduces information asymmetry. Therefore, lack of knowledge on lending requirement increases the probability of rationing.

Managerial competence: reduces the asymmetry of information by providing clearer and more detailed financial information and business plans to their banks, hence reducing the probability of rationing.

Logistic regression was also used to examine the influence of information asymmetry and transaction cost on bank's credit rationing. Dependent variable is one if the firm is rationed and 0 if otherwise. Independent variables are information asymmetry and transaction costs indices.

$$P(Y) = \frac{exp(\alpha + \beta_1 \chi_1 + \cdots\cdots + \beta_n \chi_n + \varepsilon)}{1 + exp(\alpha + \beta_1 \chi_1 + \cdots\cdots + \beta_n \chi_n + \varepsilon)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

$P(Y)$ is a latent variable denoting credit rationing. We observe $P(Y)$, which is a dichotomous (1, 0) variable indicating whether or not the respondent falls into the credit-rationed subgroup.

$X_i - Xn$ are information asymmetry and transaction costs indices. It s expected that higher information asymmetry and transaction costs would increase the probability of rationing.

3.6 Limitations of the study

This study could not include the sample of discouraged borrowers; which include entrepreneurs who chose not to apply for credit for fear that their applications might be rejected or that they might be offered unfavourable contractual conditions. Hashi and Toci (2010) argue that credit rationing is considered to be supply driven, but borrowers themselves may also be discouraged to apply for a loan in the belief that they will be refused by the bank. This means that credit rationing seems to work also through "self-selection of a borrower on the demand side" (Hashi and Toci, 2010).

Moreover, interview with credit officers revealed that most clients discuss with their credit officers before submitting their loan applications. Those applicants whose credit officers think they would be successful are advised to submit their loan applications; and those that the credit officers assume to have no qualifications are advised not to submit their applications. Unfortunately, the banks do not keep records of such customers; in the survey, we only pursued the qualifying applicants, we did not observe any additional information for the non-qualifying applicants. This also may have underestimated the seriousness of credit rationing.

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CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Sample characteristics among rationed and none rationed firms

Table 10 presents credit rationing status for the sample of 271 SMEs. The study reveals that out of 271 firms that applied for loan in the sample, 98 (36.2 percent) firms were not rationed, while 173 (63.8 percent) firms were rationed. Majority (137 50.5 percent) of the rationed firms were partially rationed, which means that they obtained some credit but not as much as desired. Thirty six (36 firms, 13.3 percent) were denied, which means that they could not obtained credit. Although the percentage looks high, the rejection rate of 13.3 percent is much lower compared to other countries. For example, Krasniqi (2010) shows that of all the firms in the sample that applied for loan in Kosova, 17.4 percent were denied. This low rejection rate may be partly contributed to the methodological limitation related to the sample identified in Chapter Three, section 3.7. However, the rejection rate is much lower for developed economies. For example, Hashi and Tocsi (2010) show that only 6.5 percent were denied credit, while the remaining 93.5 percent received the loans they applied for in countries in Southern Eastern Europe. These differences might emerge from particular features of developing economies which are characterized with less developed institutions, making information asymmetry more pronounced than in developed economies.

Table 10: Distribution of sample according to rationing status of SMEs

Description	n	Percentage
Applied and obtained full amount	98	36.2
Applied and denied	36	13.3
Applied obtained less amount than amount applied	137	50.5
Total applicants	271	100

4.1.1 Gender and rationing status

Table 11 shows the composition of the sample by gender and rationing status. The results indicate that a much small portion of female owners (21 percent) applied for loan as opposed to male counterparts (79 percent). This suggests that there is low participation of female entrepreneurs in the bank credit market. These figures are broadly consistent with data on female entrepreneurial activities from other sources (Cavalluzzo and Wolken, 2005; Muravyev *et al.*, 2009; Mijid 2009; Tambunan, 2011).

The results also reveal that 70.2 percent of female applicants and 62.1 percent of male applicants were rationed. The findings also reveal that male firms are more rejected than female applicants; 30 male firms versus 6 in rationed group. This finding is not surprising considering the fact that male entrepreneurs comprise a large portion of the entire sample. The probability is greater than .05 indicating insignificant relationship between rationing status and owner gender.

Table 11: Gender and rationing status

Sex:	n	Rationed	None rationed	*p*
				.262
Male	214 (79)	133 (62.1)	81 (37.9)	
Female	57 (21)	40 (70.2)	17 (29.8)	

4.1.2 Owner's age and rationing status

Table 12 shows that, owners with less than 35 years old comprise 41.7 percent of the entire sample, while owners with 35 to 50 years old comprise 48 percent of the entire sample. Owners with more than 50 years old comprise 10.3 percent of the entire sample. This finding is consistent with the findings from other studies which show that the entrepreneurs' ages in Tanzania generally range from 25 to 39 years (Isaga, 2012). About 92.9 percent of borrowers with less than 35 years old, 45.4 percent of borrowers swith more than 35 to 50 years and 32.1 percent of borrower with above 50 years old were rationed. These results are not surprising because the age of the owner reflects the growth of a business investment, business experience, and availability of collateral. The probability is less than .05 indicating there is a strong relationship between rationing status and owner age.

Table 12: Owner's age and rationing status

Owner age	n	Rationed	None rationed	*p*
				.000
<35 years	223 (41.7	105 (92.9)	8 (7.1)	
35 – 50 years	130 (48.0)	59 (45.4)	71 (54.6)	
50 – 65	28 (10.3)	9 (32.1)	19 (67.9)	

4.1.3 Owner's level of education and rationing status

With respect to the formal education background of the respondents (Table 13), majority of SMEs owners have completed primary and secondary education (44.6 and 42.2 percents respectively). This is not surprising, since other studies have found similar results suggesting that typically most SMEs are owned by people with lower levels of education (Kristiansen *et al.*, 2005; Isaga, 2012). As Olomi (2009) observes, less well-educated people in developing countries find it difficult to secure paid jobs, and are therefore forced to opt for self-employment as the only means of survival. The study also reveals that 76.3 percent owners with primary education, 61.1 percent of owners with secondary school education and 51.1 percent of owners with higher level of education are rationed. The probability is less than .05 indicating a strong relationship between rationing status and owner level of education.

Table 13: Owner's level of education and rationing status

Education	n	Rationed	None Rationed	*p*
				.003
Primary	93 (34.3)	71 (76.3)	22 (23.7)	
Secondary	108 (39.9)	66 (61.1)	42 (38.9)	
Higher education	70 (25.8)	36 (51.4)	34 (48.6)	

4.1.4 Borrower's knowledge on loan requirements

Results in Table 14 indicate that 74.5 percent of borrowers know bank requirements while 28.4 percent do not. This is because 73.8 percent of the sample comprised firms with previous loan. About 96.6 percent of the borrowers who lacked knowledge on lending requirements were rationed, while 48 percent of borrowers with knowledge on bank requirements were rationed. The probability is less than .01 indicating a strong relationship between rationing status and borrower's knowledge on lending requirements.

Table 14: Borrower's knowledge on loan requirements

	n	Rationed	Non rationed	*p*
				.000
I know bank requirements				
No	69 (25.5)	68 (96.6)	1 (1.4)	
Yes	202 (74.5)	105 (52.0)	97 (48.0)	

4.1.5 Borrower knowledge on business project

Results in Table 15 show that 50.9 percent of the borrowers had detailed studies of their business projects and systematically identified potential cash flows, while 49.1 percent did not do so. About 72.2 percent of borrowers who did not have detailed study of business project and 44.2 percent of borrowers who had detail study of business project were rationed.

About 71.2 percent of borrowers did not have knowledge on business project while 28.8 percent had knowledge on business project. About 76.2 percent of borrowers who lacked knowledge on business project as opposed to 33.3 percent of borrowers who had knowledge on business plan were rationed.

About 53.9 percent of the borrowers indicated that the cost of preparing systematic plans prohibited them from acquiring professional advice they needed to understand the project, and 86.3 percent of them were rationed. On the other hand, 46.1 percent of borrowers indicated that the cost of preparing systematic business plan did not constrain them, and 37.6 percent of them were rationed.

Results in Table 15 also show significant association between rationing and borrower knowledge on business project; since probabilities in Table 15 are less than .01.

Table 15: Borrower knowledge on business project

	n	Rationed	Non rationed	*p*
Make detailed study of business project				.005
Yes	133 (49.1)	96 (72.2)	37 (27.8)	
No	138 (50.9)	77 (44.5)	61 (62.2)	
Lack of knowledge on project plan or business				.000
Yes	193 (71.2)	147 (76.2)	46 (23.8)	
No	78 (28.8)	26 (33.3)	52 (66.7)	
The cost of preparing systematic plan constrains from acquiring professional advice				.000
Yes	146 (53.9)	126 (86.3)	20 (13.7)	.000
No	125 (46.1)	47 (37.6)	78 (62.4)	

4.1.6 Borrower relationship characteristics and rationing status

Results in Table 16 reveal that in the entire sample, 25.8 percent of the firms had been with the bank for not more than 3 years while 31.7 percent had been with the bank for between 3 years and 7 years; and 42.5 percent had been with the bank for more than 7 years. The table also shows that of the firms rationed 68.6 percent of the firms had not more than 3 years with bank, 76.7 percent of the firms had between 3 to 7 years with the bank and 51.3 percent of the firms had more than 7 years with the bank were rationed.

With regard to number of relationships, 63.8 percent of firms in our sample have more than one relationships ranging from 2 (56.4 percent) to 3 (7.4 percent). About 38.8 percent of the firms with single relationship were rationed as opposed to 76.5 percent of the firms with 2 relationships, and 90 percent of the firms with 3 relationships.

The study also reveal that majority 59.4 percent of the firms did not have an outstanding loan with other financial institutions, while 40.6 percent had outstanding loans with other financial institutions. About 9.5 percent of the firms with outstanding loans from other

financial institutions were rationed as opposed to 43.9 percent of borrowers with no outstanding loans from other financial institutions.

The study also reveals significant association between rationing status and relationship characteristics.

Table 16: Borrower relationship characteristics and rationing status

Description	n	Rationed	None rationed	*P*
Duration				.001
0-3 years	70 (25.8)	48 (68.6)	22 (31.4)	
3-7 years	86 (31.7)	66 (76.7)	20 (23.3)	
Above 7 years	115 (42.5)	59 (51.3)	56 (48.7)	
Number of financial institution				.000
1 institution	98 (36.2)	38 (38.8)	60 (61.2)	
2 institution	153 (56.4)	117 (76.5)	36 (23.5)	
3 institution	20 (7.4)	18 (90)	2 (10)	
Outstanding loan				
Yes	116 (40.6)	105 (90.5)	11 (9.5)	.000
No	155 (59.4)	68 (43.9)	87 (56.1)	
Number of financial product				.000
0-3	239 (95.7)	166 (69.5)	73 (30.5)	
More than 3	32 (4.3)	7 (21.9)	25 (78.1)	

4.1.7 Credit history and rationing status

Results in Table 17 reveal that 26.2 percent of the firms in our sample applied for credit for the first time, while 73.8 were not first time loan applicants. About 78.9 percent of first time loan applicants and 58.5 percent of previous borrowers were rationed.

The results reveal further that 24.3 percent renewed their credit, 44.3 percent renewed their credit 1 to 3 times while 31.4 percent renewed credit above 3 times. The results show further that 80.3 percent of the borrowers who had not yet renewed credit, 85 percent who renewed credit 1 to 3 times and 21.2 percent of the borrowers who renewed credit more than 3 times were rationed.

The results in Table 17 reveal further that 65.7 percent of the borrowers had positive experience in terms of previous loan repayment, while 8.1 percent had the opposite experience. The result also reveal that 53.9 percent of borrowers who had positive experience in previous loan and 95.5 percent of borrowers who had the opposite experience were rationed. Therefore, positive credit history in terms of loan repayments does not guarantee better credit terms in terms of receiving adequate supply of bank credit (not being rationed).

The results show further that 37.3 percent of the borrowers think that past dealing with the bank makes it easier for them to provide all information about their business while 36.5 percent think the opposite. Of the 99 borrowers who thought that past dealing with the bank did not make easier for them to provide all information about their business were rationed. On the other hand, 83 out 101 borrowers who thought that past dealing with the bank enables them to share all information about their business were not rationed. The results also revealed significant association between credit history and credit rationing.

Table 17: Credit history and rationing status

Description	n	Rationed	None rationed	*p*
First loan application				.001
Yes	71 (26.2)	56 (78.9)	15 (21.1)	
No	200 (73.8)	117 (58.5)	83 (41.5)	
Number of times renew credit				.000
None	66 (24.3)	53 (80.3)	13 (19.7)	
1 – 3 times	120 (44.3)	102 (85.0)	18 (15.0)	
Above 3 times	85 (31.4)	18 (21.2)	67 (78.8)	
Positive experience in terms of loan repayment				.000
Yes	178 (65.7)	96 (53.9)	82 (46.1)	
No	22 (8.1)	21 (95.5)	1 (4.5)	
Not applicable	71 (26.2)	56 (78.9)	15 (21.1)	
Past dealing with bank make easier to provide all information about your business				.000
Yes	101 (37.3)	18 (17.8)	83 (82.2)	.000
No	99 (36.5)	99 (100.0)	0 (0.0)	
Not applicable	71 (26.2)	56 (78.9)	15 (21.1)	

4.1.8 Firm size and rationing status

Table 18 reveal different results when we classify size of the firm by the number of employees and capital investment. Based on the number of employees, the results indicate that all sampled firms were small enterprises and most of them (64.9 percent) were micro enterprises. About 76.6 percent of micro enterprises and 47.5 percent of small enterprises were rationed.

Based on capital investment, the results reveal that most of the firms in our sample (85.6 percent) were small enterprises with capital investment of Tshs 5 to 200 million; and among them 70.8 percent had a capital investment of Tshs 5-100 million and 14.8 percent had a capital investment of between 100 and 200 million Shillings. Medium enterprises constituted only 14.4 percent with a capital investment of between Tshs 200 and 800 million. About 76.6 percent of small firms with capital investment of Tshs 5 to 100 million and 47.5 percent with capital investment of 100 to 200 million were rationed as opposed to 18 percent of medium enterprises. This builds a case for having a policy to

assist small firms gain access to bank credit. The results also revealed significant association between firm size and credit rationing.

Table 18: Firm size and rationing status

	N	Rationed	None rationed	*p*
Size: number of employees				.002
1-4 employees	176 (64.9)	124 (70.5)	52 (29.5)	
5-49 employees	95 (35.1)	49 (51.6)	46 (48.4)	
Size: capital investment				
5- 100 million	192 (70.8)	147 (76.6)	45 (23.4)	.000
100-200millions	40 (14.8)	19 (47.5)	21 (52.5)	
More than 200 millions	39 (14.4)	7 (18)	32 (82)	

2.1.9 Business age and rationing status

Majority (58.2 percent) of the firms in our sample were established less than 7 years ago, 25.8 percent had the interval age between 5 and 7; 25.8 percent had the interval age of between 2 and 4; whereas 6.7 percent of our sample were less than 2 years old; and 41.7 percent had been in business for more than 7 years. The relatively young age of the firms may be related to the fact that a free market economy was only introduced in Tanzania in the 1990s. The observation also reveals that younger firms, about 94.4 percent with less than 2 years, 94.3 percent with an interval age of 3 to 5 years and 55.7 percent with 5 to 7 years had been rationed, compared to 27.4 percent of firms which had been in business for more than 7 years. The results also show significant association between business and rationing status.

Table 19: Business age and rationing status

Age	n	Rationed	None rationed	*p*
2 years	18 (6.6)	17 (94.4)	1 (5.6)	.000
2 -5 years	70 (25.8)	66 (94.3)	4 (5.7)	
5-7 years	70 (25.8)	39 (55.7)	11 (15.7)	
Above 7 years	113 (41.7)	31 (27.4)	82 (72.6)	

4.1.10 Industry and rationing status

Table 20 presents the distribution of the sample of the responding firms in terms of the type of industry and rationing status. The results show that 52.3 percent of the sampled firms operate in the trade sector, followed by the manufacturing sector (32.5 percent), 14.0 percent of the SMEs operate in the service industry and 1.1 percent of the companies involved in construction.

The survey also reveal that 66.7 percent of the firms in the construction sector, 92.1 percent of the firms in the service sector, 66.9 percent of the firms in the trading sector and 46.6 percent of the firms in manufacturing were rationed. This reflects the collateral based lending practice that allows the manufacturing sector better access to credit as opposed to other sectors. This could be because the value of the assets (mostly in the form of factories and machines) in the manufacturing firms is usually greater than is the case in other sectors. The findings also revealed significant association between industry and credit rationing.

Table 20: Industry and rationing status

	n	Rationed	None rationed	*p*
Industry				.000
Construction	3 (1.1)	2 (66.7)	1 (33.3)	
Service	38 (14.0)	35 (92.1)	3 (7.9)	
Trade	142 (52.4)	95 (66.9)	47 (33.1)	
Manufacturing	88 (32.5)	41 (46.6)	47 (53.4)	

4.1.11 Geographic distance and rationing status

Table 21 reveal that most of the firms in our sample were allocated not far from the banks; 36.9 percent were located not more than 5 kilometres from the bank, 36.5 were located more than 5 to 10 kilometres from the bank while 26.9 percent were located more than 10 kilometres from the banks. Of the firm rationed 50 percent of firms located 0 to 5 km from bank were rationed, 69. 7 percent of firm located 5 to 10 km were rationed and 75 percent of firm located more than 10 km from bank were rationed. Moreover, the results show significant association between geographical distance and rationing status.

Table 21: Geographic distance and rationing status

Business character	N	Rationed	None rationed	*p*
Geographical distance				.001
0- 5 km	100 (36.9)	50 (50)	50 (50)	
5-10 km	99 (36.5)	69 (69.7)	30 (30.3)	
Above 10 km	72 (26.9)	54 (75)	18 (25)	

4.1.12 Governance structure and rationing status

Table 22 reveal that majority (70.8 percent) of the firms in our sample operate under sole proprietorship and only 29.2 percent of sampled firms operated as corporation which include partnership or companies. About 70.3 percent of sole proprietorship and 48.1 percent of the corporations were rationed.

The data also suggest that majority (52.8 percent) of the firms control and major decisions of the business were composed by more than one person. This is not surprising since most of the firms are run by owners and managers. About 76.6 percent of the firms whose control and major decision were made by one person were rationed while 52.4 percent of the firms whose control and major decision are made by more than one person were

rationed. Results also revealed significant association between governance structure and rationing status.

Table 22: Governance structure and rationing status

Governance structure	n	Rationed	None rationed	*p*
Ownership				.001
Sole proprietor	192 (70.8)	135 (70.3)	57 (29.7)	
Corporation	79 (29.2)	38 (48.1)	41 (51.9)	
Control and major decision				.000
One person	128 (47.2)	98 (76.6)	30 (23.4)	
More than one person	143 (52.8)	75 (52.4)	68 (47.6)	

4.1.13 Accounting practices and rationing status

Table 23 reveals that majority (64.2 percent) of the respondents always kept records of the receipt and payments. About 77.6 percent of the respondents who did not always keep a record of receipts and payments were rationed as opposed to 39.2 percent of the firms that always kept records of receipts and payments.

With respect to preparation of financial statements, Majority 68.3 percent of the firms sometimes prepare financial statement, 25.5 percent prepare financial statement most of the time while 6.3 percent did not prepare financial statement. Eighty percent of the firms which sometimes prepare financial statements, 52.9 percent of the firms which never prepare financial statements and 23.2 percent of the firms which always prepare financial statement were rationed

The table reveal further that majority of the respondents (69.7 percent) had the view that the costs of preparing financial statement either always or sometimes constrained them from preparing these statements, while 30.3 percent stated that they were not constrained

by the costs of preparing financial statement. About 28 percent of the firms which were not constrained by the cost of preparing financial statement were rationed as opposed to 81.3 percent of the firms which are always constrain by the cost of preparing financial statement and 74.6 percent of the firms which are sometimes constrained by the cost of preparing financial statement.

The survey also reveal further that 62.4 percent of the respondents always deposited business receipts while 37.6 percent deposited their business receipt sometimes. About 56.8 percent of the borrowers who deposit their receipt always and 75.5 percent of the borrowers who deposit their collections sometimes were rationed. The study also found out significant association between accounting practices and rationing status.

Discussion with SMEs owner managers reveal that turnover of most SMEs bank account, did not reflect their real turnover; since most of them did not deposit all their receipt in the business bank account. Lack of knowledge on income tax system contributed to this problem. Most of them believed that since TRA requires their bank statement for tax evaluation, hence, higher account turnover will reflect higher tax burden. Hence, most SMEs owners had multiple banking relationships to avoid higher income tax burden. The study reveals that 63.8 percent has multiple banking relationships.

Table 23: Accounting practices and rationing status

Description	n	Rationed	None rationed	*p*
Keep records of receipts and payments				.000
Sometimes	174 (64.2)	135 (77.6)	39 (22.4)	
Always	97 (35.8)	38 (39.2)	59 (60.8)	
Preparation of FS				.000
Never	17 (6.3)	9 (52.9)	8 (47.1)	
Sometimes	186 (68.3)	149 (80)	37 (20)	
Always	68 (25.5)	16 (23.2)	53 (76.8)	
Constrain by cost of prepare FS				.000
Always	134 (49.4)	109 (81.3)	25 (18.7)	
Sometimes	55 (20.3)	41 (74.6)	14 (25.4)	
Never	82 (30.3)	23 (28)	59 (72)	
Banking all collection				.002
Sometimes	102 (37.6)	77 (75.5)	25 (24.5)	
Always	169 (62.4)	96 (56.8)	73 (43.2)	

4.1.14 Collateral and rationing status

Table 24 reveal that all the sampled firms in our sample provided collateral: however, the collaterals of eight of these firms were not registered. The all eight firms with unregistered collateral were rationed. The survey results also reveal that 62.8 percent of the respondents provided collateral coverage of 150 percent or less, while 38 percent provided collateral coverage of more than 150 percent. About 70.2 percent of the respondents with collateral coverage of not more than 150 percent and 53.4 percent of the firms with collateral cover of more than 150 percent were rationed. The study finds significant associations between collateral offered and rationing status.

The survey included the question as to why SMEs were rationed or rejected. Most of the partially rationed SMEs stated high collateral requirements as opposed to the loan amount as the main reasons for being rationed, while the rejected borrowers stated lack of registered collateral as the reason of having been rationed. Commercial banks require collateral cover on loan of 125 to 150 percent. The commercial banks accept only

registered collateral mostly land and building. Most of the rejected borrowers complained about costly and bureaucratic process of registering and evaluating collateral especially for collateral located in areas which are not surveyed.

Table 24: Collateral and rationing status

Description	n	Rationed	Not rationed	*p*
Provide collateral				.026
Yes	271 (100.0)	173 (63.8)	98 (36.2)	
No	0 (0.0)	0 (0.0)	0 (0.0)	
Registered collateral				.000
Yes	263 (97.0)	165 (62.7)	98 (37.3)	
No	8 (3.0)	8 (100)	0 (0.0)	
Degree of collateralization				.005
< 150	168 (62.0)	118 (70.2)	50 (29.8)	
Above 150	103 (38.0)	55 (53.4)	48 (46.6)	

4.1.15 Loan maturity and rationing status

The result in Table 25 reveal that 58.3 percent of the respondents applied for short term loan while 41.7 percent applied for long term loan. The results also reveal that the 50 percent of short term loan applicants and 83.2 percent of long term loan applicants were rationed. The study also reveal significant association between loan maturity and rationing status.

Table 25: Loan maturity and rationing status

Description	n	Rationed	Not rationed	P
Loan maturity				.000
< 1 year	158 (58.3)	79 (50.0)	79 (50.0)	
1 – 3 years	113 (41.7)	93 (82.3)	20 (17.7)	

4.2 Results on views of credit officers

Results in Table 26 reveal that 85.7 percent of the SMEs owners are rationed because of having insufficient knowledge about loan procedures and about 93 percent lack the information needed by the banks in order access bank credit, and lack of ability to clearly

demonstrate the viability of their loan request (60.7 percent). Discussion with credit officers showed that borrowers who were not sufficiently knowledgeable about their loan requests were suspected of being mischievous about their intentions thus promoting an adversarial atmosphere in credit decision-making. As a result, insufficient knowledge by the borrower provides grounds for credit rationing due to potential misunderstandings between the credit officer and the borrower. This misunderstanding occurs because of inadequate information to evaluate their project, as stated by 75 percent of credit officers.

Discussion with credit officers revealed that borrowers who know the purpose of borrowing and bank lending procedures are more willing to share information with credit officers than those who do not know. This information-sharing makes credit officers better informed about borrowers, which enhances their bonding and hence leads to a lending environment characterised by trust, transparency and cooperation between loan officers and borrowers. This environment alleviate credit rationing due to increased understanding between credit officers and SME borrowers.

Substantial number (69.2 percent) of credit officers were of the view that low managerial capacity of firm owners is one of the major reasons for SMEs being rationed. This is reflected in the inability of firm owners with low managerial competence to understand bank lending policies and procedures and exhibit confidence on the business proposals, which normally lead to inadequate loan preparation a fact stated by by 60 percent of credit officers.

Table 26: The views of credit officers on firm and entrepreneur characteristics and risks of extending loan to SMEs

	Response			Total
	Agree	Not sure	Disagree	
Most of the SMEs are not knowledgeable about loan procedures	24 (85.7)	2 (7.1)	2 (7.1)	28 (100)
Most of the SMEs do not know information needed by the banks when applying for credit	26 (92.9)		2 (7.1)	28 (100)
SMEs managers do not exhibit confidence concerning knowledge of their proposal	17 (60.7)	2 (7.1)	9 (32.1)	28 (100)
SMEs always provide inadequate information to evaluate their project	21 (75.0)	2 (7.1)	5 (17.9)	28 (100)
Low managerial capacity of owner	18 (69.2)	3 (11.5)	5 (19.2)	26 (99.9)
Weakness of family owned management	16 (64.0)	5 (20.0)	4 (16.0)	25 (100)
Firms lack close relationship with the banks	19 (73.1)	3 (11.5)	4 (15.4)	26 (100)
Most SMEs always lack credit history	23 (82.1)	1 (3.6)	4 (14.3)	28 (100)
Most SMEs lack collateral	27 (96.4)		1 (3.6)	28 (100)
SMEs always do not provide truthful information about their projects	16 (57.1)	3 (10.7)	9 (32.1)	28 (100)
Most SMEs manipulate their information in order to meet credit requirements of the bank	23 (82.1)	3 (10.7)	2 (7.1)	28 (100)
Poor quality of financial statement provided by SMEs	21 (75.0)	5 (17.9)	2 (7.1)	28 (100)
Asymmetric valuation of project overvaluation of the projects by SMEs)	22 (78.6)	6 (21.4)		28 (100)
SMEs loan are more risky than other loans	10 (47.6)	4 (19.0)	7 (33.3)	21 (99.9)
Low capacity to repay the loan	13 (52.0)	1 (4.0)	11 (44.0)	25 (100)
Most SMEs divert loan money to fund instead of the projects agreed with in the contract	22 (78.6)	2 (7.1)	4 (14.3)	28 (100)
High monitoring costs of SMEs loan	18 (64.3)	4 (14.3)	6 (21.4)	28 (100)
Nature of lending technology (SMEs cost of applying for credit and credit assessment techniques)	18 (75.0)	2 (8.3)	3 (12.5)	23 (95.8)
Inflexibility of lending procedures	13 (50.0)	6 (23.1)	7 (26.9)	26 (100)

Sixty four (64) percent identified weaknesses of family owned management. The survey also revealed that most SMEs are owned by family with the husband as the owner and the wife as the manager. Consequently, most of these do not keep financial records. This in turn affects the amount of information available to evaluate business project.

Lack of close relationship with the bank was suggested by 73 percent while lack of credit history was identified by 82 percent of the credit officers. Qualitative information reveals that some borrowers went to the bank with collateral and expecting the bank to give them fund, but they have been with the banks for a short period while others have not been with the bank at all. Banks need to know viability of borrowers' business – for example turnover of their business, a bank account of more than one year. Moreover, other borrowers had business with more than one bank, which caused difficulty for credit officers to ascertain the real turnover of their bank accounts. Moreover, most SMEs owners borrow from more than one bank but they don't share this information with credit officers which makes it difficult for credit officers to assess their credit history.

About 96.4 percent of credit officers indicated that credit applications are mostly rejected due to having insufficient collateral, that is, unacceptable or unsuitable collateral. Loans granted by commercial banks require some type of collateral. Qualitative information reveals that availability of collateral is frequently not the source of the problem; it is the availability of suitable collateral required by the bank. Banks accept immovable asset preferable registered land and/or real estate as collateral (suitable collateral). However, movable asset such as machinery and motor vehicles may be accepted as collateral to supplement land or real estate. According to BOT regulations, a loan is considered to be fully secured if the value of collateral is at least 125 percent of the credit accommodation, partly secured if the value of collateral is less than 125 percent and unsecured if there is no

collateral offered. However, the banks involved in the study require collateral cover of between 125 and 150 percent.

Regarding identification of the authenticity of the information disclosed by the borrowers concerning the borrowers' business projects, 57.1 percent of the credit officers cited untruthful information about SMEs project while 82.1 of the credit officers cited manipulation of information to meet bank requirement. A substantial number (75 percent) of credit officers identified poor quality of financial statement as another problem. Most credit officers expressed doubts about the quality of SMEs financial information because most of these SMEs do not keep records. In addition, most of the cash flow projections presented by SMEs borrowers do not reflect their business turnover. These projections are not consistent with the turnover on their bank accounts; low turnover would usually be reflected by a few transactions that appear in their bank accounts. Consequently, credit officers believe that SMEs owners go out of their way to prepare financial information which satisfies the amount of loan which they (the owners) intend to borrow without considering their real cash flow. This has a negative impact on the quality of financial information submitted to the bank; as a result the problem of asymmetric valuation of the project between credit officers and the bank arises. It is apparent from Table 26 that majority 78.6 percent of credit officers considered asymmetric valuation of the project as a major reason for credit rationing of most of the SMEs.

The survey also revealed that 47 percent of credit officers cited a high risk of lending to SMEs as the main reason for having SMEs being credit rationed. The results from qualitative interview revealed that SMEs which were untrustworthy tend to disappear after getting the loan; that was why most banks tended to be cautious in lending money to

SMEs. Moreover, most SMEs owners lacked business experience, they were new in business and were seeking for loan for the first time.

About 78.6 percent of the credit officers cited loan divergence as another problem among SMEs owners. Discussions with credit officers indicated misuse of loan money/loan divergence as the main reason for poor performance of most SMEs. Customers used the loaned fund to finance tasks/business other than the ones identified in the business plan during loan application.

Low capacity to repay loan was suggested by 52 percent of credit officers interviewed as another setback among SMEs owners. Qualitative interview revealed that most loan applicants ran small business which did not reflect the turnover that would persuade a bank to grant these SMEs the required loan. Other issues stated by credit officers as limiting factor were nature of lending technology stated by 75 percent of credit officers while inflexibility of lending procedures was identified by 50 percent of credit officers.

High assessment and monitoring costs of SMEs loan was stated by 64.3 percent of credit officers. In depth interviews with credit officers revealed that there were rather high administrative costs for commercial banks to manage small amounts of loan due to incompressible fixed charges, such as cost of information gathering, pricing, and loan follow-up.

During the survey, credit officers were asked to identify and explain other factors which they thought constrained SMEs from accessing bank credit. Lack of business experience was identified by most credit officers as the main additional reason for having SMEs being denied credit. They argued that most SMEs have been established in recent years

and the owners themselves lack the necessary experience and business knowledge. It was reported further that these owners lack necessary information needed in credit decision such as track record of business performance. Banks also regard new business as high risk borrowers, because of their high failure rate. Therefore, the banks did not offer credit to new business because they (the banks) were not sure of the viability of these new businesses. Another serious problem was the inability of writing business plan. Credit officers suggested that those with good business ideas and potential entrepreneurial talents need to be helped by professionals to write business plans. However, some of them are constrained by the cost of preparing such plans.

4.3 Testing the hypotheses

This section examines the results generated in terms of the Hypotheses H1 to H5 in Chapter One. A coefficient is deemed to be statistically significant if the p-value is 0.05 or less.

4.3.1 ANOVA on extent of rationing across firm and entrepreneur characteristics

The first objective of this study was to determine the rationing status of commercial loans to SMEs and its variation across industries, size, sex, age, governance structure and loam maturity. It was hypothesised that the extent of rationing varies significantly across entrepreneurs' ages, business age, gender, industry, loan maturity, and governance structure. Before running the ANOVA test, we measured the extent of rationing for each group. Table 27 presents the extent of credit rationing for the rationed firms with positive demand for credit. Accordingly, ANOVA findings are presented in Table 28.

The results in Table 27 revealed that SMEs with positive demand for bank credit had an average desired credit of approximately Tshs 39 500 000 millions and average credit

received of 28 800 000 million. The results also indicate that credit rationed SMEs with positive demand for credit had an estimated average desired credit of Tshs 35 500 000 and an average actual credit received of Tshs 18 700 000 (52.67 percentage of the desired amount). Rationed SMEs would have desired 47.32 percent more credit. The extent of rationing is much higher than the one reported in other studies conducted in other countries. For example, Chakraborty and Mallick (2012) found that credit constrained small businesses would on average desire 20 percent more credit; this implies that they receive 80 percent of the desired amount.

Table 27 revealed further that male borrowers had an average desired credit of Tshs 43 400 000 million and an average credit received of Tshs 32 000 000 million. On the other hand, female borrowers had an average desired credit of Tshs 24 900 000 million and the average credit received was Tshs 16 500 000 million. The results also reveal that female borrowers experienced tighter rationing (33.73 percent) than did the male borrowers (26.27 percent).

The results also indicate that as the owner's age increased, the average desired credit also increased. Owners with 35 years or less had an average desired credit of Ths 26 000 000 where as owners above 35 to 50 years and above 50 to 65 years had the desired credit of Tshs 45 100 000 and Tshs 67 800 000 respectively. The results show further that the extent of rationing decreased as the owner's age increased. The extent of rationing is 55.77 percent for owners with 35 years old or less, it decrease to 17.83 percent and 12.11 percent for owners with between 35 to 50 years and for owners above 50 to 65 years respectively.

Table 27 reveals further that young firm with two years or less had an average desired credit of Tshs 26 400 000 million, but the average credit received was only Ths 3 280 000. The extent of rationing also varied across business age; firms with less than two years in business experienced tighter constraints than any other firms in the sample; on average they desired 87.76 percent more credit. The extent of rationing decreased as the age of the firm increased to 46.54 percent for firms with 2 to 5 years old in business, 36.21 percent for firms with 5 to 7 years old in business, and 10.20 percent for firms with more than 7 years in business. This is not surprising because 13 out of eight respondents with 2 years or less in business were denied credit. This implies that younger firms face difficulties in accessing bank credit, even those who received credit experience tighter rationing.

The extent of rationing also varied substantially across sizes of the firms. Small firms that employ 1-4 employees had an estimated extent of rationing of 34.6 percent, but the rationing fell to 21.22 percent for firms employed 5 to 49 employees. Similarly, the extent of rationing is higher for small firms with capital investment of Tshs 5 million to 100 million, the rationing decreased to 22.03 percent for firms with more than Tshs 100 million up to 200. Medium enterprises with more than Tshs 200 million amount of capital invested desire 9.46 percent more credit if they could borrow more at the prevailing interest rate.

The findings also indicate that the extent of rationing was low (17.77 percent) for manufacturing firms; whereas for trade, service and construction firms, the extent of rationing was 29.76 and 52.17 percents and 50.62 percent respectively. This implies that construction and service sectors experienced tighter rationing than other sectors. The extent of rationing was much higher for sole proprietorship (34.60 percent) than it was for corporation (17.3 percent). Lastly, the study revealed that the extent of rationing varied

across loan maturity with short term loan experiencing less constraint (17.91 percent) than long term loan (44.28 percent).

Table 27: The extent of credit rationing for the rationed firms with positive demand for credit

Variables	n	Desired credit	Actual debt Received	Excess desired credit	Extent of rationing
Entire sample	271	3.95	2.88 (72.91)	1.07	27.09
Rationed	173	3.55	1.87 (52.68)	1.68	47.32
Not rationed	68	4.65	4.65 (100.00)	0.00	00.00
Gender:					
Female	57	4.34	3.20 (73.73)	1.14	26.27
Male	214	2.49	1.65 (66.27)	0.84	33.73
Owners age:					
18- 35 years	113	2.60	1.15 (44.23)	1.45	55.77
35 – 50 years	130	4.51	3.71 (82.15)	.805	17.85
50 – 65 years	28	6.78	5.96 (87.89)	.821	12.11
Business age:					
< 2 years	18	2.64	.328 (12.42)	2.32	87.76
2- 5 years	70	3.61	1.93 (53.46)	1.68	46.54
5- 7 years	70	2.90	1.85 (63.79)	1.05	36.21
Above 7 years	113	5.02	4.51 (89.80)	.512	10.20
Size of firm: Capital invested					
5-100 millions	195	2.54	1.47 (58.26)	1.06	41.73
100-200 millions	40	6.40	4.99 (77.97)	1.41	22.03
More than 200 millions	39	8.40	7.61 (90.54)	.795	9.46
Number of employees:					
1- 4	176	2.72	1.78 (65.40)	.941	34.60
5 – 49	95	6.22	4.90 (78.78)	1.32	21.22
Industries:					
Manufacturing	88	5.55	4.56 (82.23)	.986	17.77
Trade	142	3.12	2.19 (70.22)	.929	29.76
Service	38	3.22	1.54 (47.83)	1.68	52.17
Construction	3	5.67	2.80 (49.38)	2.87	50.62
Type of governance:					
Sole proprietorship	192	3.18	2.08 (65.40)	1.10	34.60
Corporation	79	5.83	4.81 (82.68)	1.01	17.32
Loan maturity:					
≤ one year	158	4.40	3.61 (82.09)	.788	17.91
1< 3 years	113	3.32	1.85 (55.72)	1.47	44.28

The findings in Table 28 show that the p-value for the owner's sex is greater than 0.05, which means that there is no significant difference in the mean scores between males and female SMEs with respect to the extent of rationing. Likewise, the P-value for family business was more than 0.05, which also means that there is no significant difference in the mean scores of extent of rationing between family owned businesses and other businesses. The results also revealed that there is a significant difference in the mean scores of extent of rationing across owners' ages, the firm's age, loan maturity, governance structure (business ownership), and business size (capital investment). The results are consistent with those from a study by Chakraborty and Mallick (2012) which show that credit gap (extent of rationing) varies considerably across industries, the size of firm, and corporate governance.

Table 28: ANOVA results on extent of rationing across firm and entrepreneur characteristics

	F	*P*
Rationing status	363.036	0.000
Sex	0.192	0.661
Owner age	54.926	0.000
Business age	61.831	0.000
Size: number of employees	6.966	0.009
Amount of capital invested	22.719	0.000
Industry	10.489	0.000
Governance : business ownership	6.859	0.009
Family ownership	0.298	0.585
Loan maturity	71.641	0.000

4.3.2 Binary logistic regression results on entrepreneur characteristics and credit rationing

Binary logistic regression was conducted to investigate the influence of entrepreneur characteristics on the probability of rationing. Dependent variable is 1 if the firm is credit rationed and 0 if otherwise. Independent variables are entrepreneur characteristics. Overall, the logistic model successfully predicts the possibility of SMEs credit rationing (87.5 percent), with Nagelkerke R^2=0.750 and Cox-Snell R^2 = 0.547. Therefore it can be concluded that the explanatory power of the logistic model is satisfactory and the model can be used to explain the probability of credit rationing by the SMEs. The findings are presented in Table 29.

Based on the estimated results in Table 29, there is some evidence for gender differences taking a form of a higher probability if the firm's principal owner is a female; albeit the relevant coefficient is significant only at the 10 percent level. The estimated increase in credit rationing is approximately 3.229 times higher for women-owned firms than for male owned firms. Other studies reveal a significant difference in the probability of rationing between male and female entrepreneurs (Fletschner, 2009; Muravyev *et al.*, 2009; Han, 2008). The reasons for this difference is the fact that, a direct comparison of rationing status by gender condition on applying for loan may be misleading due to the low participation of female entrepreneur in bank credit market. Descriptive statistics in table 11 shows that female enterprises comprise only 21 percent of the entire sample. Furthermore as Muravyev (2009) observes, most women are discouraged from applying for a bank credit; because of this, a pool of female applicants is likely to consist of women whose businesses have superior characteristics of performance and creditworthiness. This would also underestimate rationing status for women applicants.

Table 29: Binary logistic regression results for entrepreneur characteristics and bank's credit rationing

Variables	B	S.E.	Wald	Sig.	Exp(B)
Sex: Female	1.172	.663	3.127	.077	3.229
Owner age Above 50 years			12.422	.002	
18-35 years	1.648	.858	3.686	.055	5.194
35 to 50 years	-.561	.739	.577	.448	.571
Education Higher education			4.129	.127	
Primary education	.947	.679	1.942	.163	2.578
Secondary education	-.336	.567	.350	.554	.715
Experience in years	-1.706	.954	3.199	.074	.182
Lack knowledge to understand business plan	1.135	.552	4.221	.040	3.110
Detail study of business plan	-1.239	.528	5.498	.019	.290
Cost of prepare business plan	1.065	.530	4.040	.044	2.901
Lack prior knowledge on bank requirements	3.340	1.199	7.764	.005	28.206
Relation- reputation	2.411	.564	18.294	.000	11.151
Relationship Duration Above 7 years			10.700	.005	
1-3 years	-2.173	.666	10.658	.001	.114
3-7 years	-.849	.619	1.880	.170	.428
Relationship – number of financial institutions			2.146	.342	
One institution	-1.369	1.039	1.735	.188	.254
More than one institution	-.823	1.015	.659	.417	.439
Relationship; outstanding loan	2.145	.583	13.529	.000	8.544
Relationship: Number of financial product	.829	.766	1.171	.279	2.291
Constant	-.118	1.753	.005	.946	.889

Moreover, interviews with credit officers from the three banks revealed that female entrepreneurs were more likely to be rationed than male entrepreneurs. It is argued that SME-female borrowers often lack the ability to meet bank-lending criteria. Most SME female borrowers lacked business skills and collateral. Cultural barriers compound the problem of female borrowers not getting collateral. Women generally do not own land and this makes them depend on their husbands who decide whether or not their wives should

carry out any business and hence provide collateral for it. Therefore, the result on the owner's sex should be taken with caution.

The analysis also showed that young borrowers with 18 to 35 years had a higher probability of being rationed than was the case with adult borrowers aged more than 50 years. The coefficients of young borrowers were positive and statistically significant. The marginal effect was 5.194 times higher for young borrowers than for adult borrowers. The reason why young borrowers were more likely to be credit rationed was that young entrepreneurs very often lacked the proven track record, business experience and collateral. With regard to adult borrowers aged between 35 to 50 years old, the relevant coefficients were negative, suggesting that the likelihood of rationing decreased with an increased age, however, they are not statistically significant. Therefore, we find no significant difference on the probability of rationing between adult borrowers aged 35 to 50 years old and adult borrower with more than 50 years old. This result should be taken with caution, the non-significant result may be attributed to the fact that majority of the entrepreneurs in our sample were in the same age category. Actually, almost half of the respondents were between 35 and 50 years of age at the time of the interview.

The analysis also show that, compared to owners with higher level of education the probability of rationing increased when the principal owner has primary level education, with the marginal effect of 2.578 times. For owners with secondary education the coefficient is negative, implying that the probability of rationing decreased when the principle owner had secondary education, with the marginal effect of .715 times. This relationship is expected since higher levels of education imply better technical knowledge, know-how and business skills, more information on credit markets and facilities and familiarity with bureaucratic procedures. Moreover highly educated managers are

supposed to reduce the asymmetry of information by providing clearer and more detailed financial information and business plans to their banks compared with managers with lower levels of education. Surprisingly, the coefficients of owners' levels of education were not statistically significant. This suggests that the level of formal education does not matter in explaining SMEs credit rationing in Tanzania. This result is inconsistent with the findings of Han (2008), who indicates that the entrepreneur' level of formal education is a significant determinant of the probability of rationing. However, this result should be read with some caution; because the lack of significance could be due to the fact that majority of the entrepreneurs in this sample had low levels of formal education. Indeed, in our study, 74.2 percent were found to have primary and secondary levels of education. Otherwise, this result raises an important question regarding the value of formal education acquired by these entrepreneurs.

The results also suggest that entrepreneur's experience in running a similar type of business reduced the probability of being rationed. This is consistent with empirical literature, albeit statistically significant at only 0.10 percent. This is surprising since the bank considers business experience in their credit decision. Entrepreneurs who have previous experience in the industry in which the current business is based are more likely to see their business growing in terms of sales, assets, and employment. Other studies show that work experience in the same sector seems to create knowledge and skills which are needed in order to run a firm successfully (Han, 2008). Another reason is the fact that experienced entrepreneurs have already learned the art of how to make profits through a combination of having a client base for their products/services, cost effective sources for their inputs/goods for sale and control of costs. This makes experienced entrepreneurs more likely to be able to repay the loans given to them and hence less likely to be credit rationed.

Survey analysis shows that entrepreneur who lacked knowledge to understand the project plan had higher probability of being rationed. Marginal effect is 3.11 times for entrepreneur who lacked knowledge to understand the project plan compared to who did not. Moreover, the estimates are rather robust, being statistically significant at the 0.05 percent level.

Detailed study of business project was found to exert a significant and sizeable negative impact on the probability of being rationed. Surprisingly, the analysis revealed that entrepreneurs who did not make detailed study of business projects ere less likely to be rationed compared to entrepreneurs who did. This may be explained by the problem of competence miss-match between entrepreneurs and bank officials. Whilst entrepreneurs tend to focus more on the technical possibility of their projects than on the financial management, bank officials on the other hand focus more on the financial possibilities than on gaining technical understanding of the business project. Another possibility is that this variable is associated more closely with project viability than with information transparency.

The cost of preparing systematic plan was found to exert a significant and positive impact on the probability of being rationed. The marginal effect is 2.901 times for the entrepreneur whose costs of preparing systematic plan constrain them from preparing systematic business plan. Therefore, entrepreneurs who are constrained by the cost of preparing systematic plan had a higher probability of being credit rationed than entrepreneurs who were not constrained by the costs of preparing business plan.

The analysis shows that the entrepreneur who lacked prior knowledge on the bank requirements was likely to be rationed; the coefficient was positive and statistically

significant at 1 percent level of significance. The marginal effect was also high (28.206 times) suggesting that the likelihood of rationing is high for borrowers who lack prior knowledge of the bank requirements. This is not surprising, since prior knowledge regarding bank requirements enables clients to provide adequate information to credit officials and alleviate information asymmetry problems hence credit rationing. Moreover prior knowledge enhances the ability of the entrepreneurs to deal with cumbersome bank requirements and procedures successfully.

Relationship characteristics were measured using five variables namely reputation, credit duration, outstanding loan with other financial institutions, the number of financial institutions and the number of financial products with the bank. The regression results show that, the coefficient of borrower's reputation was positive and statistically significant. The marginal effect is 11.151 times higher for the firms which renew credit 0 to 3 times than for those which renew credit more than three times. This implies that the probability of rationing is higher for borrowers with little reputation compared to borrowers with high reputation

The results also suggest that the duration of relationship of 1 to 3 years negatively and significantly decreased the probability of being credit rationed. Though statistically significant, the contribution of these categories is very low 0.114 times. The marginal effect increased to 0.428 times as the relationship duration increased from 4 to 7 years albeit statistically insignificant. This implies that even though the problem of information asymmetries is not acute; SMEs are still regarded as risky and hence the banks are still reluctant to lend. Another possibility is that firms with long relationship with the bank fear to reveal some information concerning their businesses to the bank.

The analysis also found that the number of outstanding loans with other financial institutions is significantly associated with higher likelihood of rationing. According to our results, the likelihood of rationing was higher for the firms with outstanding loans with other financial institutions than was the case with firms without outstanding loans. The likelihood of rationing was 8.544 times higher for the firms with outstanding loan from other financial institutions than for the firms without outstanding loan from other financial institutions. Surprising, we expect the likelihood of rationing for these firms to be low; since the firms with outstanding loan would have provided track record of repayment capability. An explanation for this result is the possibility that these variables are associated more closely with financing problems than with information transparency. This is because entrepreneurs with outstanding loans have to pay higher interests which may also affect the credit risk. Further, this can also be reflected in their turnover of their bank account (in terms of deposit and withdraw); since the business will be servicing more than one loan. The parameter of the number of financial institutions and financial products are of positive sign, albeit statistically insignificant and large in magnitude. These result are inconsistent with the results in other studies by Cosci and Meliciani (2002), Harhoff and Kaorting (1998), De Bodt *et al.* (2005) who found out that the probability of rationing is affected by the number of bank relationships.

4.3.3 Binary logistic result on firm characteristics and bank's credit rationing

Binary logistic regression was conducted to investigate the influence of firm characteristics on the probability of rationing. The dependent variable was 1 if the firm is credit rationed and 0 if otherwise. The independent variables were business characteristics. Overall, the logistic model successfully predicts the possibility of SMEs credit rationing (84.4 percent), with Nagelkerke $R^2 = 0.717$ and Cox-Snell $R^2 = 0.523$. It can be concluded that the explanatory power of the logistic model is satisfactory and the model can be used

to explain the probability of credit rationing by the SMEs. The findings are presented in Table 30.

Table 30 reveals that compared to age group of above 7 years, the probability of rationing is high for the age groups of less than 2 years, between 2 and 5 years old, and between 5 and 7 years old. The coefficient of this indicator shows a positive sign and a relatively high magnitude. Furthermore, the estimates are rather robust, being statistically significant at the 0.05percent level. Hence, low business age is predictive for credit rationing. Interview with credit officers revealed that the firm's age is considered to be a very important factor by the commercial banks in Tanzania. The banks are reluctant to provide loans to those enterprises that have not started and to those enterprises with less than 3 years. The reason is that the degree of information asymmetry is high for young firms with relatively short observable history. This is because banks have no time to obtain information through the business lifecycle and to obtain private information through the lending relationship. Several empirical studies (Cole, 1998; Harhoff and Korting, 1998; Beck *et al.*, 2006; Voordeckers and Steijuers 2008, Hashi and Toci, 2010) have also shown that the probability of rationing is high for young firms.

Surveyed analysis shows that rationing exhibits a positive significant variation across firms' sizes in terms of capital investment and compared to medium firms, the likelihood of rationing is 21.830 times and 20.083 times for small firms with capital investment of between Tshs 5 and100 million and between Tshs 100 million and 200 million respectively. The number of employees was also found to exert a sizeable positive impact on the probability of being rationed. Thus small firms with 5 employees or less have a high probability of rationing. This is not surprising because the greater the size of the business the greater the amount of resources and experience which have been accumulated

and this could make the lenders look more favourably upon these businesses. A small size is related with relatively high transactions costs for holding debt and lenders have higher monitoring costs. This is consistency with other studies such as Voordeckers and Steijvers (2008) and Drakos and Giannakopoulos (2011).

Table 30: Binary logistic regression results for firm characteristics and bank's credit rationing

Variables	B	S.E.	Wald	Sig.	Exp(B)
Business age Above 7 years			37.832	.000	
0-2 years	4.059	1.368	8.804	.003	57.900
2 to 5 years	5.236	.951	30.324	.000	187.879
5 to 7 years	3.447	.689	24.999	.000	31.399
Firm size 0-5 employees	-1.528	.723	4.473	.034	.217
Capital investment Above 200 million			10.621	.005	
5-100 million	3.083	.985	9.801	.002	21.830
100 – 200million	3.000	1.033	8.434	.004	20.083
Industry Manufacturing			7.879	.049	
Construction	1.329	1.584	.704	.402	3.776
Service	1.911	.918	4.337	.037	6.761
Trade	1.545	.584	7.007	.008	4.689
Distance More than 10 km			5.431	.066	
0-5km	-1.700	.800	4.514	.034	.183
5-10 km	-.888	.804	1.220	.269	.412
Governance structure Business type	-.729	.604	1.458	.227	.483
Control and major decision	.657	.485	1.835	.176	1.929
Record keeping	-.006	.570	.000	.992	.994
Preparation of FS Mostly			8.826	.012	
Never	-.044	1.022	.002	.966	.957
Sometimes	1.742	.826	4.446	.035	5.709
Cost of Preparing FS Never			.755	.686	
Mostly	-.227	.760	.089	.765	.797
Sometimes	.328	.785	.174	.676	1.388
Bank Collection	-1.329	.562	5.596	.018	.265
Collateral Value	-.425	.497	.731	.393	.654
Constant	-2.179	1.046	4.336	.037	.113

The analysis reveal that service and trade sectors had a higher probability of being rationed compared to the manufacturing sector. Compared to manufacturing industry the likelihood of rationing for the firms operating in the service and trade sectors is about 6.661times and 4.789 times respectively. Interview with credit officers revealed that all the three banks were unwilling to finance projects within service sector. The risk of

lending to the service sector is exacerbated by the inability of entrepreneurs in the sector to offer consistent turnover of their bank accounts (deposit and cash flow) to support their credit application and adequate collateral. The results are consistent with those in other studies (Drakos and Giannakopoulos, 2011 and Chakraborty and Mallick, 2012) which found that credit rationing depends on the sectoral heterogeneity.

The analysis reveals further that geographical distance has a significant impact on the probability of rationing. Thus firms located between 0 to 5 kilometres had less probability of being rationed than those located more than 10 kilometre due to information asymmetry, high transaction costs and perceived risks. This finding is in line with Petersen and Rajan (2002); Felsenstein and Fleischer (2002); Agarwal and Hauswald (2006) and De Young *et al.* (2008), who found out that entrepreneurs located further away from their banks are more likely to be credit rationed.

Discussion with credit officers from all the three banks revealed that geographical distance is taken into consideration when issuing SMEs loan. This is due to the fact that most small businesses require small amounts of loan, and the banks have to consider both transaction costs (assessment and monitoring costs) of issuing the loan and the loan returns. Thus, the farther away the small business is from the bank the higher the transaction costs resulting from screening and monitoring activities. However, the banks may issue loans to distant customers provided that the transaction costs of issuing the loans are covered by the amount of interest received from the loan.

All variables used to measure governance structure (ownership structure and control and major decision) are statistically insignificant, though, high in magnitude. These results are

inconsistent with the results of a study by Drakos and Giannakopoulos (2011) who found out that sole proprietorships are more likely to be credit rationed than corporation.

Four variables were used to measure accounting practice which ensures availability, quality and reliability of financial information. The variables were proper record keeping, preparation of financial statement, the cost of preparing financial statement and banking collections. The results reveal that record keeping does not influence the probability of being rationed. The coefficient of record keeping was positively related to the probability of being credit rationed, albeit statistically insignificant. The probability of being credit rationed decreases by 0.006 times for the firms which always keep records of receipts and payments compared to those which did not. The explanation for this result is the possibility that this variable is not related to information disclosure. Even though the firm may keep proper records of receipts and payments, the records need to be reflected in the turnover of their bank accounts. Banks consider both cash flow shown in the financial statement and turnover of the bank account; if the turnover of the bank account is inconsistent with cash flow statement, the bank decision will be based on the turnover of a bank account. For that reason, even if SMEs did not maintain financial documentation, a bank could project about the future cash flows of SMEs through turnover of their bank accounts.

The results showed further that the likelihood of rationing is high and statistically significant for firms that sometimes prepared financial statements compared to those that always prepare financial statements. The marginal effect is 5.709 times higher for the firms which sometimes prepared financial statement than was the case for the firms which always prepare financial statement. The coefficient of business which did not prepare financial statements though positive with high magnitude was not statistically significant

at least at the 10 percent level of significance. This could be explained by the low representation (17 firms - Table 23) of the firms which never prepare financial statements. Table 30 reveals further that coefficients of the cost of preparing financial were not statistically significant at least at the 10 percent level of significance. This was not surprising because most of the SMEs did not always prepared financial statements; therefore, most of them did not incur those costs.

The results reveals further that banking collection which reflect the firm's turnover of their bank accounts were found to be an important measure of rationing. The coefficient of banking collection is significantly negative at 5 percent level of significance. This meant that banking collection decreased the likelihood of rationing. This is not surprising, because interviews with credit officers revealed that the banks compared a firm's account turnover with cash flow exhibited by the bank statement. Thus, banking collection improves the firm's account turn over as presented by bank statements. Cross tabulation between rationing and banking collection (Table 23) revealed that among 98 non rationed firms, 73 firms had their collection done always.

In the survey, the respondents were asked to provide explanation on all accounting practices variables. Qualitative information revealed that most of the SME owners did not appreciate the need for preparing financial statements for business purposes. The preparation of financial statements meant a cost to the firm, since most of them lack the knowledge of preparing financial statements. Qualitative information also revealed that even those firms which prepared financial statement, majority of them purposely omitted formal and correct accounting practices in order to avoid taxes. As a result, the prepared financial statements did not reflect the true financial position of their firms, which in turn

lead to more rationed SMEs. The results also reveal that majority of SMEs owner did not appreciate the use of financial information to make business decision.

Two measures were used to measure collateral namely, whether the collateral was registered and secondly the amount of collateral offered as a percentage of the loan received, which can be risk mitigation for the bank. The first measure was not included in the model since most of the collaterals offered were registered (97 percent). The coefficient of the collateral offered is positively related to the probability of being credit rationed, albeit statistically insignificant. For the firms that pledge collateral value of 150 percent or less, probability of being rationed decreased by 0.654 times. This result should be taken with caution, since most of the firms in our sample pledge collateral value of less than 150 percent. Though statistically insignificant, qualitative information revealed that lack of adequate collateral as the main reason for having most of the SMEs rationed.

4.3.4 Binary logistic regression on information asymmetry and transaction costs and credit rationing

The forth objective of this study was to determine the influence of information asymmetry and transaction costs on banks credit rationing. It was hypothesised that the higher the information asymmetry and transaction costs the higher the probability of rationing. Before running the logistic regression, we present descriptive statistics of index construction of AIINDX and TCIDX. Table 31 shows the mean and standard deviation of each measure used to develop AIINDX.

Table 31: Means of items used to construct AIINDX

	Mean	Std. Deviation	n
Business owner age	1.4170	.49397	271
Age of business	1.5830	.49397	271
Preparation of financial statements	1.7491	.43435	271
Lack expertise to fully understand the project plan	1.7122	.45359	271
Make a detailed study of your business project	1.4908	.50084	271
Knowledge on lending requirements	1.2546	.43645	271
Bank all your collections	1.3764	.48537	271
Outstanding loan	1.4280	.49571	271
First loan application	1.2620	.44053	271
Relationship duration	1.5756	.49516	271
AIINDX	14.8487	2.82108	271

Table 32 shows the correlation for the 10 items used to measure the information asymmetry and composite index. Table 32 reveals that individual items in the index are significantly positively related with the score on the composite index, as such, it is logical to use them as a proxy for information asymmetry. These factors show a good internal consistency with the Cronbach's alpha above 0.7 (see Table 8 Chapter 3).

Table 32: Correlation between AIINDX items and composite index scores

Index items	R	Sig
Business owner age	.633	.000
Age of business	.749	.000
Preparation of financial statements	.667	.000
Lack expertise to fully understand the project plan	.542	.000
Make a detailed study of your business project	.596	.000
Knowledge on lending requirements	.633	.000
Bank all your collections	.531	.000
Outstanding loan	.584	.000
First loan application	.509	.000
Relationship duration	.619	.000
AIINDX	1.000	.000

Table 33 reveals that the average mean score on the AIINDX is 14.8487; non rationed groups have an average mean score of 12.5102 with a maximum score of 17, while rationed groups have an average mean score of 16.1734 with a maximum score of 20.

Table 33: Asymmetric information index and credit rationing

	n	Mean	Std. Deviation	Minimum	Maximum
None rationed	98	12.5102	2.09686	10.00	17.00
Rationed	173	16.1734	2.26551	10.00	20.00
Total	271	14.8487	2.82108	10.00	20.00

Three items were used to measure transaction costs. Table 34 shows the means of each measure used to develop TCINDX.

Table 34: Means of items used to construct TCINDX

Index items	Mean	Std. Deviation	n
Size of firm in terms of capital invested	1.8561	.35165	271
Distance in km from business to the bank	1.2657	.44251	271
Constrain by cost of preparing systematic business plan	1.5387	.49942	271
TCINDX	4.6605	.85368	271

Table 35 shows the correlation between the items used to measure the transaction cost and transaction cost index. Inspection of the correlation reveals that all items are related with composite index at 0.01 levels, which provides an adequate basis for using them as a proxy for information asymmetry. The Cronbach's alpha for the index as a whole was found to be above 0.7, implying that internal consistency is quite high (see Table 9 Chapter 3).

Table 35: Correlation between TCINDX items and composite index scores

Index items	R	Sig
Size of firm in terms of capital invested	.602	.000
Distance in km from business to the bank	.602	.000
Constrain by cost of preparing systematic business plan	.752	.000

Table 36 reveals that the average (mean) score on the TCINDX is 4.6605 non rationed groups have an average mean score of 4.0612 while rationed group have an average mean score of 5.

Table 36: Transaction costs index and credit rationing

	n	Mean	Std. Deviation	Minimum	Maximum
None rationed	98	4.0612	.72959	3.00	6.00
Rationed	173	5.0000	.72336	3.00	6.00
Total	271	4.6605	.85368	3.00	6.00

Binary logistic regression was conducted to investigate simultaneously the influence of information asymmetry and transaction costs on credit rationing. The dependent variable is 1 if the firm is credit rationed and 0 if otherwise. The independent variables are information AIINDX and TCINDX indices. Overall, the logistic model successfully predicted the possibility (78.2 percent), of credit rationing of SMEs, with Nagelkerke R^2 = .547. It can be concluded that the explanatory power of the logistic model is satisfactory and that the model can be used to explain the probability of credit rationing by the SMEs. The findings are presented in Table 37.

Based on the estimated results Table 37 suggests that information asymmetry and transaction costs increased the probability of being rationed, with marginal effect of 1.699 times and 2.513 times respectively. Therefore H4 was accepted.

Table 37: Logistic regression on AIIDX and TCINDX on credit rationing

	B	S.E.	Wald	Sig.	Exp(B)
AIINDEX	.530	.085	39.227	.000	1.699
TCINDEX	.922	.262	12.366	.000	2.513
Constant	-11.197	1.386	65.225	.000	.000

4.3.5 ANOVA result on impact of credit rationing on sales and employment growth

The fourth objective of this study was to examine the impact of credit rationing on sales and employment growth of SMEs. It was hypothesised that the growth of rationed SMEs in terms of sales and number of employees varies significantly from the growth of non rationed SMEs. However, before running the ANOVA test, we compared the mean of SMEs growth for partially rationed, rejected and non rationed groups. After obtaining significant omnibus F-test Tukey's, HSD post-hoc tests was used to explore the differences

among the means so as to provide specific information on which means are significantly different from each other.

The mean of SMEs employment growth for partially rationed, rejected and non-rationed SMEs were 2.47, 1.72, and 2.76 respectively. The mean scores for sales growth were 2.54, 1.75 and 2.81 for partially rationed, rejected, and non-rationed SMEs respectively. The findings suggest that the mean scores for partially rationed, rejected and non-rationed groups varied in terms of sales and employment growth.

Table 38: Means of sales and employment growth for rationed and non rationed SMEs

Growth Measures	Rationing status	n	Mean	Std. Deviation
Employment growth	Partially rationed	137	2.47	.501
	Rejected	36	1.72	.659
	Non- rationed	98	2.76	.538
	Total	271	2.47	.625
Sales growth	Partially rationed	137	2.54	.500
	Means for SMEs growth	36	1.75	.649
	Non- rationed	98	2.81	.511
	Total	271	2.53	.619

ANOVA was used to test whether the differences in the mean scores across partially rationed, rejected and non-rationed group are statistically significant. Table 39 show that the p-values for both approaches were less than 0.05, which means that there is a significant difference among rationed and non-rationed groups. Significant ANOVAs was followed up with Tukey's HSD post-hoc tests, as shown in Multiple Comparisons Table 40.

Table 39: ANOVA tests on sales and employment growth for rationing and SMEs growth

SMEs growth measure	F	Significance
Sales growth	53.147	.000
Employment growth	48.611	.000

Table 40 reveals that mean scores for the sales growth were statistically significantly different among partially rationed, rejected and non-rationed groups. Likewise, the mean employment scores were statistically significantly different among partially rationed, rejected and non- rationed groups.

Table 40: Tukey's HSD post-hoc tests on sales and employment growth for rationed and non rationed SMEs

Dependent Variable	Rationing (a)	Rationing (b)	Mean Difference (a-b)	Sig.
Sale growth	Partially rationed	Rejected	.790*	.000
		Non- rationed	-.266*	.000
	Rejected	Partial rationing	-.790*	.000
		Non- rationed	-1.056*	.000
	Receive desired amount	Partial rationed	.266*	.000
		Rejected	1.056*	.000
Employment growth	Partially rationed	Rejected	.745*	.000
		Non-rationed	-.288*	.000
	Rejected	Partial rationing	-.745*	.000
		Non- rationed	-1.033*	.000
	Receive desired amount	Partial rationed	.288*	.000
		Rejected	1.033*	.000

4.4 Summary of empirical findings

Table 41 presents an overview of the hypotheses derived in this study and the empirical findings.

Table 41: Summary of empirical findings

Hypotheses	Empirical evidence
H1. Extent of rationing among SMEs does vary significantly across industries, size, gender, age, governance structure, and loan characteristics.	Supported: The result indicates a significance difference in the mean scores of extent of rationing ac-ross owner's age, business age, firm size, industry, business ownership, and loan maturity.
H2. Entrepreneur characteristics influence bank's credit rationing	Supported: owner's age, knowledge on bank requirements and business plan, cost of preparing business plan, detailed study of business project, borrower's reputation, relationship duration and the number of outstanding loans appear to be significant.
H3. Firm characteristics influence bank's credit rationing	Supported: business age, size, industry (service and trade), distance, accounting practices appear to be significant.
H4. The higher the information asymmetry and transaction costs the higher the probability of rationing	Supported: both information asymmetry and transaction cost indices influence bank's credit rationing
H5.Growth of rationed SMEs in terms of sales and number of employees vary significantly from the growth of non rationed SMEs	Supported: The result indicate a significance difference in the mean scores of sales and employment growth for the rationed and non-rationed SMEs

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

A micro economic analysis was used in this study to assess the determinants and impact of credit rationing on SMEs growth at the firm level. The main advantage of this approach is that rationing of individual firms can be explained by individual characteristics of the firms and their owners. Furthermore, the micro data collected by the researcher through survey allowed the construction of a variable closely correlated with the informational asymmetry and transaction costs. The next sections present the conclusions regarding the hypotheses and descriptive findings from credit officers presented and discussed in Chapter 4.

5.1.1 Extent of rationing

The first objective of this study was to determine the extent of rationing across industries, firm size, gender, firm age, owner age, governance structure, and loan characteristics. To address this objective, it was hypothesized that the extent of rationing varies significantly across industries, size, gender, business age, governance structure and loan characteristics. The testing of this hypothesis was base on ANOVA test. The ANOVA test revealed that the extent of rationing varies significantly across owner's age, firm age, loan maturity, firm size and governance structure. This study, therefore, concludes that the extent of rationing for SMEs varies across owner's age, firm age, loan maturity, firm size, and governance structure in Tanzania.

5.1.2 Firm and entrepreneur characteristics and credit rationing

The second objective of this study was to determine the influence of firm and entrepreneur characteristics on bank's credit rationing. To address this objective two hypotheses were developed. The first hypothesis tested the significance of entrepreneur characteristics in explaining bank's credit rationing. Entrepreneur characteristics were represented by 10 characteristics namely: sex, age, education, experience, wealth, prior knowledge on bank requirements, knowledge of preparing business plan, cost of preparing business plan, knowledge on business project and relationship with financial institutions. Results from binary logistic regression revealed that owner's age, experience, knowledge on banks requirements, knowledge on business plan, cost of preparing business plan, borrower's reputation, relationship duration, and the number of outstanding loans have an influence on bank's credit rationing. This study, therefore, concluded that certain characteristics of entrepreneurs influence the SMEs credit rationing in Tanzania.

The second hypothesis tested the significance of firm characteristics in explaining bank's credit rationing. Binary logistic regression produced results which demonstrated that business age, size, industry (service and trade), legal form, distance and accounting practices- preparation of financial statement and disclosure (banking collections)- influenced credit rationing. From these findings, the study concluded that a number of firm characteristics can effectively predict the SMEs credit rationing.

5.1.3 Information asymmetry and transaction costs and credit rationing

The third objective of this study was to determine the influence of information asymmetry and transaction costs on credit rationing. It was hypothesized that the higher the information asymmetry and transaction costs the higher the probability of credit rationing. Binary logistic regression results revealed that higher information asymmetry and higher

transaction costs are positively related to credit rationing. Based on this finding, the study concluded that SMEs credit rationing is positively influenced by higher information asymmetry and higher transaction costs.

5.1.4 Findings regarding views from credit officers

The fourth objective of this study was to determine factors that constrain banks from supplying adequate credit to SMEs. The findings from credit officers presented and discussed in Chapter 4 show that credit rationing in Tanzania appears to be driven primarily by client characteristics – lack of ability to clearly demonstrate the viability of their loan request, insufficient knowledge about the bank requirements and business project, low managerial competence of the owner, lack of business experience, low cash flow reflected by turnover of their bank accounts, unreliable and poor quality financial information, inadequate information disclosure, inadequacy of collateral, poor relationship with the banks, lack of credit history, asymmetric valuation of project, and higher assessment and monitoring costs of SMEs loan.

5. 1.5 Credit rationing and SMEs growth

The fifth objective of this study was to determine whether or not the growth of rationed SMEs in terms of sales and employment differ from the growth of non rationed SMEs. To address this objective it was hypothesized that the growth of rationed SMEs in terms of sales and number of employees varies significantly from the growth of non rationed SMEs. ANOVA tests revealed that credit rationing affect the growth of SMEs both in terms of sales and employment growth. This study, therefore, concluded that credit rationing influence the growth of SMEs.

5.2 Recommendations

To overcome credit rationing and ensure SMEs have access to adequate bank credit the following key challenges facing SMEs, commercial banks, and the policy makers need to be addressed.

5.2.1 SMEs owner manager

First, SMEs access to loans from commercial bank is constrained by opacity of their operations. Since creditors have limited information on SMEs, SMEs need to be able to present convincing and realistic business plans showing potential future returns and viability. The study findings suggest that improper accounting practices increases the probability of being credit rationed by the banks. This calls for capacity building of SMEs in areas of accounting practices if they are to be rated as credit worthy borrowers by the banks. It is important for SMEs to be able to show consistent cash flow; in line with the performance of their bank accounts. SMEs also need to keep proper financial statements with an up-to-standard accounting books and develop a culture of transparency and accountability.

The study also reveals the presence of gender differences in accessing bank credit and low composition of female business in the entire sample. Female SME owners also need to take greater responsibility for their own learning: they need to develop a positive attitude towards entrepreneurship. Moreover, without collateral, it is virtually impossible for these entrepreneurs to get the required funding from the commercial banks. Women entrepreneurs therefore need to have personal assets to be used as collateral. This could reduce their level of discouragement and improve their demand for credit.

5.2.2 Commercial banks

The study findings reveal that borrower's prior knowledge on the bank requirements and procedure influence credit rationing. Therefore, the banks should make their lending policies public to increase SMEs awareness of the bank procedures. Awareness of the products that can benefit SMEs entrepreneurs could specifically be promoted by commercial banks through print and electronic media, trade associations, and government agencies. It is also recommended that banks should develop comprehensive training programmes for borrowers about all aspects of the lending transaction in order to positively influence them.

Lending practices of the commercial banks are still largely based on excessive collateral requirements. However, due to higher opacity of SMEs operations and lack of collateral, augmenting credit assessment capability of the commercial banks is vital for SMEs with a good business plan (most likely with limited collateral) to gain credit access. The banks need to develop innovative lending practices to meet the credit demand of SMEs; SMEs having higher informational problems or not having adequate collateral does not necessarily mean that they have 'bad' projects at hand. The banks should acquire information processing capabilities and lending techniques that overcome asymmetric information with cost-effective financial services to SMEs. For example, relationship-based lending creditor can monitor their business conditions closely; this will reduce information asymmetry between the banks and the borrowers. Therefore, commercial banks should focus more on the soft information in their financing decision to enable SMEs with a good business plan access credit.

Commercial banks also need to recognise women entrepreneurs as a distinct market opportunity and seek to understand their particular needs. In addition, commercial banks

should collect and report gender disaggregated data on their loan clients. Commercial banks in Tanzania could introduce a 'competency-as-collateral' scheme, as is done by some banks in India. Such a scheme integrates measures of management competency with the conventional credit risk assessment criteria. Female SMEs owners without collateral but who are educated and possess the required management competencies could be eligible for credit facilities. Commercial bank should disaggregate their portfolios and targets and put in place strategies that will help them to better understand and serve the women's market.

5.2.3 Government

As reviewed in Chapter One, SMEs continue to play important roles in developing the multi-sector economy and the government have polices to promote and support development of SMEs. Government policies will be more effective if the policy-makers understand characteristics of SMEs that constrain SMEs from accessing bank credits. This will improve SMEs access to bank and promote their growth thereby stimulating economic diversification, employment creation opportunities, and contributing to poverty reduction, in line with goals and targets under NSGRP II, and the Tanzania Development Vision 2025.

Based on the study findings, this study recommends the following to be considered by government policy-makers.

(i) Government policies should aim at reducing the problem of information asymmetry by formulating rules on financial reporting and disclosure and the use of appropriate accounting and auditing standards. These rules will ease the screening and monitoring processes by the banks. When firms become more transparent and the accounting information becomes more reliable and

meaningful, the banks will be able to adopt lending technologies based on hard information. Moreover, weak transparency is a fundamental feature of SMEs, thus enhancing the availability of information through credit registers will decrease the costs of screening loan applications.

(ii) The government should promote SMEs through training and skills provisions that will enable these SMEs qualify for bank loans; this is especially because of the fact that lack of knowledge on business plan preparation and poor standard of accounting practices influence credit rationing behaviour. The Government should focus on facilitating SMEs to generate bankable projects, for example to facilitate preparation of business plans and offering the necessary training to enable SMEs access financial services. More specifically, the government should provide training programs in business plans and financial management skills for the owners and managers of SMEs.

(iii) Since most of the SMEs complain about bureaucracy in land registration, the government need to improve registration of land. Concerted efforts are required to speed-up reforms on land management and eliminate unnecessary bureaucracy and hurdles in the registration of land. Without having registered titles of land, SMEs will continue to face barriers in accessing credit and expanding their enterprise

(iv) Since lack of knowledge on income tax assessment leads to incomplete and/or untruthful information disclosure, the Government through TRA, should provide training to SMEs on income tax assessment.

(v) The study revealed that credit rationing varies across industry. No single policy can cover all these businesses operating in different industrial sectors and with many sector specific challenges. Thus, data categories should be sufficiently differentiated to provide detailed information to support targeted policy

approaches and practical interventions. It is worth reconsidering whether SMEs should be considered as one group. For policy purposes, a one- size-fits-all approach certainly will not work.

5.3 Recommendations for further research

It should be noted that while this study makes a number of contributions, there are some limitations that point out important avenues for future research. First, the experiences that were explored in this study involved borrowers who had actually applied for bank credit. Further research is needed to study the experiences of those SME borrowers who never approach the bank and those who were rejected before submitting loan application (discouraged borrowers).

Secondly, the sample was selected from urban areas of only two regions, out of the 26 regions in Tanzania. Future research that examines the influence of firm and entrepreneur characteristics on credit rationing should also consider urban and rural areas of other regions. Lastly, there is also need to intensify research into the aspects that were brought in the study. More specifically, future research should focus on examining the applicability of credit rationing and its determinants that were identified in the study to specific sectors of the society- like youth, female, service and trading- and short and long term loans.

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APPENDICES

Appendix 1: Introduction Letter

PhD Credit rationing questionnaires

Student: Martha A Maziku

Dear friend,

I am conducting a research study of small and medium sized enterprises in Tanzania. The objective of this study is to understand the influence of firm and owner manager characteristics constraining SMEs from accessing adequate credit from bank's and impact of credit rationing on SMEs growth. You have been selected in the survey because of your potential to provide the required information. I am aware that you are very busy, but I would be grateful if you could take the time to answer this questionnaire.

I am also sensitive about maintaining absolute confidentiality about your specific business operations. In this regard, I will treat your answers in the strictest confidence and use the information only for this research.

I would like to thank you in advance for your time and participation in this research study.

Thank you,

Martha A Maziku

Appendix 2: SMEs Questionnaire

THIS QUESTIONNAIRE SEEKS TO OBTAIN INFORMATION FROM SMALL AND MEDIUM SCALE ENTREPRISES

The purpose of this questionnaire is to collect data that will enable the researcher to investigate limited access to bank credit by SMEs and its impact on their growth.

IDENTIFICATION OF RATIONED AND NON RATIONED SMEs

1 Did you apply business loan from commercial bank?

a) Yes

b) No

2. If yes to Qn.1, did the bank turn down your loan application?

a) Yes

b) No

2(b) Please explain why did bank turn down your loan application

3. If no to Qn.102, would you like to borrow more at prevailing interest rate?

a) Yes

b) No

3(a) Please indicate the amount of loan you were willing to borrow ..... and amount of loan you received .....

or

4 Specify the amount of loan you receive as percentage amount of loan you were willing to borrow at prevailing rate of interest.

a) 50%-65%

b) 65%-80%

C) 80%-95%

4(a) Please explain why did you receive less than what you were willing to borrow

ENTREPRENEUR CHARACTERISTICS

1. Please indicate sex of the owner

a) Male

b) Female

2. Please specify business owner age

a) Bellow 35 years

b) 35-50 years

c) 50-65

d) Above 65

3. Please state education level of the owner

a) Primary

b) Secondary

c) Higher education

d) Other

4. Please indicate ethnicity of the owner

a) Black Tanzanian

b) Indians

c) Arabs

d) Other specify

5. Do you have experience in running similar type of business?

a) Yes

b) No

5(b) If yes to Qn. 205 indicates number of years in running the business.....

Knowledge on business plan and bank requirements

6. Do you lack knowledge to understand or prepare the project plan?

a) Yes

b) No

7. Did you use professional consultant to prepare or understand your business project before approaching your bank for credit.

a) Yes

b) No

8. Did you make a detailed study of your business project and systematically identify potential cash flow before applying credit.

a) Yes

b) No

9. Do you rely on the examples of your friends with similar business to understand the viability of your project?

a) Yes

b) No

10. Do you think cost of preparing systematic plan constrain you from acquiring professional advice needed to understand your business plan

a) Yes

b) No

11. Do you know all information required by banks in order for you to obtain credit before consulting your bank for credit?

a) Yes

b) No

12. Do you think information requested by banks concerning your loan application is useful for the purpose of getting the loan

a) Yes

b) No

c) am not sure

13. Do you fear to reveal some of information because it is confidential to you?

a) Yes

b) No

Owner credit history

14. Is this loan your fist loan?

a) Yes

b) No

If No to question 214, please answer question 214-218

14(a) Indicate numbers of times you renew credit fro your bank

a) None

b) 1-3 times

c) Above 3 times

15. Do you have problems in your previous loan?

a) Yes

b) No.

16. Did you made positive experience in your previous loan with the bank in term of loan repayment

a) Yes

b) No

17. Do you think past dealing with bank makes it easier for you to provide all information about your firm loan?

    a) Yes

    b) No

18. Do you think your previous loan assist you to get better credit terms in your current loan application in term of receiving applied amount?

    a) Yes

    b) No

Owner banking relationship

20. For how long have you been with the bank?

    a) 0-3 years

    b) 4-7years

    c) Above 7 years

21. Please indicate number of financial institution you're dealing with

    a) One

    b) Two

    c) More than two. Please specify

22. Do this business have outstanding loan with other financial institutions

    a) Yes

    b) No

23. Please indicate number of financial products you have with the bank

    a) 0-3 products

    b) More than 3. Please specify

FIRM CHARACTERISTICS AND THEIR PRACTICES

30. What is the age of your business?

    a) Less than 2 years

    b) 2-5 years

    c) 5-7 years

    d) Above 7 years

31. Please indicate size of the firm in terms of number of employees

    a) 1-4 employees

    b) 5-49 employees

    c) 50-99 employees

32. Please indicate size of the firm in terms of capital invested

    a) 5-100 million

    b) 100-200 million

    c) Above 200million

33. Please indicate the industry in which your firm belong

    a) Manufacturing

    b) Service

    c) Agriculture

    d) Trade

    e) Other. Please specify.....

34. Please specify formality of your business

    a) Informal business

    b) Formal business

35. What is the distance in kilometres from your business to the bank?

    a) 0- 5 km

    b) 5-10 km

c) 10-15 km

d) 15-20 km

e) Above 20 km

36. Please specify the location of your business

a) Town

b) Outside town

c) Rural area

d) Other specify.....

37. Did your firm had delinquent business obligations in the past years

a) Yes

b) No

38. Did your firm or the owner declared bankruptcy in the past years

a) Yes

b) No

39. Did your firm or owner had default loan in the past years?

a) Yes

b) No

40. Did your business made profit in previous years?

a) Yes

b) No

41. Indicate whether your sales change since rationed/receive adequate credit

a) Decrease

b) Steady

c) Increase

42. Did you have permanent employees before applying credit from commercial bank?

    a) Yes

    b) No

43. Please indicate whether your permanent employees change since rationed/receiving adequate credit

    a) Decrease

    b) Steady

    c) Increase

44. Please specify whether the bank loan which you applied is the only source of finance to your business

    a) Yes

    b) No

45. Apart from bank loan you applied what are your other sources of finance to your business?

Governance structure of SMEs

46. Type of business

    a) sole proprietor

    b) corporation

47. Is the business family owned?

    a) Yes

    b) No

48. Who run the business?

    a) Owner

    b) Manager

    c) Manager and owners

49. Is a manager family member?

a) Yes

b) No

50. Please indicate number of people exercising control and make major decision of the business

a) I person

b) More than 1 person. Please specify

Accounting practice

51. Do you typically need audited financial statements to apply for and receive loan

a) Yes

b) No

		Always	Sometimes	Never
52	Do you always keep records of receipt and payments			
53	Do you bank all your collections?			
54	Do you prepare financial statements?			
55	Do you follow international accounting standards when preparing financial Statement			
56	Do you audit your financial statement?			
57	Do you use professional accountant to prepare and audit your financial statements?			
58	Does the cost of professional accountant constrain you from using their services?			

59. Please provide explanation for questions in the table above.....

Collateral

60. Do you typically have to provide collateral to receive bank loan

a) Yes

b) No

61. If yes, what type of collateral do you offer?

a) Land or building

b) Machinery and equipments

c) Stocks

d) Other asset, specify.....

62. Was your collateral registered?

a) Yes

b) No

If no, explain why.....

63. Indicate value of collateral offered as a percentage of loan

a) 100%- 150%

b) 150%-150%%

LOAN CHARACTERISTICS

64. What is the duration of your loan maturities?

a) 0 - 1 year

b) 1-3 years

c) Above 3 years

65. Credit use

a) For start up

b) Expansion

c) Financing working capital

d) Purchasing fixed asset

THANK YOU

Appendix 3: Bank Officials Questionnaire

THIS QUESTIONNAIRE SEEKS TO OBTAIN INFORMATION FROM CREDIT OFFICERS

The purpose of this questionnaire is to collect data that will enable the researcher to investigate factors constraining bank's from supplying adequate credit to SMEs

A. Please indicate whether the following factors in the table below constrain you from supplying adequate credit to SMEs

	Agree	Not sure	Disagree
1.Most of the SMEs are not knowledgeable about loan procedures			
2. Most of the SMEs do not know information needed by the banks when applying for credit			
3. SMEs managers do not exhibit confidence concerning knowledge of their proposal			
4. SMEs always provide inadequate information to evaluate their project			
5. Low managerial capacity of owner			
6. Weakness of family owned management			
7. Firms lack close relationship with the banks			
8. Most SMEs always lack credit history			
9. Most SMEs lack collateral			
10. SMEs always do not provide truthful information about their projects			
11. Most SMEs manipulate their information in order to meet credit requirements of the bank			
12. Poor quality of financial statement provided by SMEs			
13.Asymmetric valuation of project overvaluation of the projects by SMEs			
14. SMEs loan are more risky than other loans			
15. Low capacity to repay the loan			
16. Most SMEs divert loan money to fund instead of the projects agreed with in the contract			
17. High monitoring costs of SMEs loan			
18. Nature of lending technology (SMEs cost of applying for credit and credit assessment techniques)			
19. Inflexibility of lending procedures			

B. Please provide explanation for the factors you identified above which you think constrain you from supplying adequate credit

C. Please identify and explain any other factors which constrain you from supplying adequate credit to SMEs

THANK YOU

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