

**SOCIO-ECONOMIC FACTORS INFLUENCING ACCESS TO CREDIT
BY SMALL- AND MEDIUM-SCALE FOOD-PROCESSING FIRMS IN ZAMBIA'S
LUSAKA DISTRICT**

BY

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**SOCIO-ECONOMIC FACTORS INFLUENCING ACCESS TO CREDIT
BY SMALL- AND MEDIUM-SCALE FOOD-PROCESSING FIRMS IN ZAMBIA'S LUSAKA
DISTRICT**

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**BY
JOSHUA SINYANGWE**

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List of Acronyms

ADB	Agricultural Development Bank
CSO	Central Statistics Office
FAO	Food Agricultural Organization
GDP	Gross Domestic Product
MACO	Ministry of Agriculture and Cooperative
MFNP	Ministry of Finance and National Planning
MFI	Micro Finance Institution
MSME	Micro- Small and Medium-scale Enterprises
NBFI	Non- Bank Financial Institution
SME	Small and Medium scale Enterprises
SNDP	Sixth National Development Plan
SPSS	Statistical Package for Social Sciences
ZBS	Zambia Business Survey
ZCSMBA	Zambia Commerce of Small and Medium Business Association
ZDA	Zambia Development Agency

ABSTRACT

Socio-economic Factors Influencing Access to Credit

by Small- and Medium-Scale food-Processing Firms in Zambia's Lusaka District

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Food processing is one sector within the agricultural sector that offers support and market opportunities to the farming community, proving national food security and reducing poverty. Literature has shown a dearth in knowledge regarding factors influencing access to credit by small and medium scale food processors. This study uses data from 100 randomly selected Lusaka-based small- and medium-scale food processors to identify factors affecting their access to credit. The sampling frame used to sample was obtained from Terchnoserve and Zambia Chamber of Small and Medium Business Association. Structured questionnaires were developed, pre-tested and used for collecting data from the sampled Processors. Logistic regression model was employed in the analysis. Factors that contributed significantly and positively to credit access were tertiary education, land or a house as requirement for collateral. Factors significantly and negatively influencing access to credit by SMEs Food Processors include sex of the proprietor, age of the proprietor, partnership as a form of ownership and being a cereal processor. Policy recommendations are that provision of information regarding credit accessibility as well as a well-established interaction between the borrowers and “financial institution”

Key words: Credit, food processing, small and medium scale enterprise, logistic regression

CHAPTER ONE

INTRODUCTION

1.1 Introduction and Problem Statement

The agricultural sector is cited as important in enhancing economic growth, food security and poverty reduction. According to Miller et al. (2010), agriculture has twice the potential of reducing poverty as other economic sectors globally. It generates, on average, 29 percent of gross domestic product (GDP), and employs 65 percent of the labor force (Ibrahim and Bauer, 2013). In 2011, agriculture contributed 21.5 percent of Zambia's GDP (CSO, 2011), out of which 11 percent was contributed by agro-processing and manufacturing industries (ZDA, 2011). The agro-processing subsector is able to increase the value of crops of poor farmers and thus yield higher returns, expand marketing opportunities, improve livelihoods of people, extend shelf-life of commodities, improve palatability of commodities, enhance food security and empower women who are often involved in agro-processing (Mhazo et al, 2012). In Sub Saharan Africa, it is estimated that 60 percent of the labor force find part of its work in small-scale food processing enterprises and the majority are women.

The agro-processing sub-sector in Zambia has a number of opportunities. These opportunities include; animal or stock feed production, cassava processing (food and other industrial products), cashew nut processing grain milling (rice, maize, wheat etc), edible oil production fruit canning and juice extraction, meat, dairy, leather and leather products fish canning and fish meal production, cotton spinning and textiles, bio-diesel production and ethanol production (MACO, 2010)

The agricultural sector faces challenges of access to credit by various players including the agro-processing subsector (Sassa *et al.* 2000; Mhazo, et al. 2012). The potential of the agricultural sector may not be realised due to low productivity that is as a result of limited access to credit among other challenges (Olagunju, 2013; FAO, 2009).

Credit is a very important instrument in enhancing productive capacity by financing investment in both human and physical capital for most businesses including small scale agribusiness firms (Okurut et al., 2004). Farmers require credit to undertake investment or adopt new technologies (Khandker and Faruquee, 2002). Limited access to credit by smallholder farmers entails low levels of capital investment and less farm improvement (Whichern *et al*, 2006; Nyirenda 2007).

A survey on growth constraints facing enterprises, conducted by the World Bank in 1997, showed that lack of access to credit accounted for 71.6 percent of growth constraints faced by small scale enterprises (Nyirenda, 2007). Lack of access to finance has been cited by over 20 percent of the micro, small and medium scale enterprises as a ‘very severe obstacle’, whereas a further 29 percent cite it as ‘a major obstacle’ to growth (ZBS, 2010).

Literature has shown that farmers and entrepreneurs who accessed credit facilities improved their *productivity, production and hence profits* (Olagunju, 2013; Franca, 2013). A study by Gatti and Love, (2008), shows a positive correlation between access to credit and productivity.

The Zambian financial system is composed of both the formal and informal credit providers. The formal Zambian financial system is dominated by the banking sector whose total assets are K6, 430 billion as at 30 September 2004 was 32 percent of the country’s gross domestic product (GDP). The formal Zambian financial system comprises the Central Bank, commercial banks and the Non-Bank Financial Institutions (Mataka, 2004). As at end of June 2008, there were 14 commercial banks (as at December 2010 there were 17 registered banks) and 71 NBFIs, including 15 microfinance institutions (MFIs) and 11 leasing and finance companies (ZBS. 2010). The informal credit provision is dominated by individuals who lend to other individuals and charge a specific agreed upon interest rate (Nyirenda, 2007).

There are several common financial sector-wide challenges that have been identified. These include the dearth of skilled human resource, the inadequate legal infrastructure, different accounting and auditing standards, lack of financial safety nets, poor credit culture due to lack of a credit reference bureau, absence of anti-money laundering regulations and an inefficient payments system (MFNP, 2004).

According to Taylor et al. (2009), *agricultural lending is both risky and expensive. Banks are reluctant to lend to the agricultural sector without very high collateral coverage and a high risk premium. It is noted that in agriculture, non-performing loans accounts for 37 percent against 13 percent across other sectors of the economy. Further, they note that the agricultural finance market is faced with three fundamental challenges. These include; a highly-risky lending environment caused largely by unpredictable Government intervention as well as weaknesses in the legal framework, limited understanding of agricultural markets and limited expertise in agricultural*

finance among most banks and other financial institutions and poor risk management practices and limited financial analysis and management capabilities within the agricultural sector.

Much of the literature on credit focused on the producers and on areas such as constraints to and determinants of farmers' access to and demand for institutional credit (Sarap, 1990; Mohamed and Temu, 2008; Mpuga, 2010; Etonihu et al. 2013; (Ololade and Olagunju 2013; Togba 2009; Kiplimo, 2013; Wanyama *et al.* 2005; Nimoh *et al.* 2012; Yehula,2008). Others looked at the impact of credit on investment, productivity, efficiency and profitability (Hazarika and Alwang, 2012 Foltz, 2002; Ibrahim and Bauer, 2013; Guirkingner and Boucher, 2008; Omonona *et al.* 2010; Olagunju, 2013; and Akinbode, 2013). Acquah *et al.* (2012) compared loans applied for to loans actually obtained by the farmers.

Much fewer studies had focused on access to credit by micro-, small- and medium-scale enterprises (MSMEs). These studies had centered on determinants, inhibiting factors and constraints associated with access to and demand as well as supply of credit by MSMEs and its effect on growth and profitability (Aryeetey et al. 1994; Kimuyu and Omiti, 2000; Atieno, 2001; Adade, 2012; Calice et al. 2012; Franca, 2013; Ahiawodzi and Adade, 2012; Martina and McCann, 2011), many of these MSMEs where in areas such as manufacturing (Ahiawodzi and Adade, 2012; Maurel, 2001; Hoekman and Djankov, 1999; Bernstein and Nadiri, 1993; Schiantarelli and Sembenelli (1999; Schiantarelli and Jaramillo, 1999; Bratkowski, et al. 2000). A review of the literature revealed mixed evidence of factors influencing access to credit and its effect on performance by producers and MSMEs. Factors such as interest rate distance from credit source, collateral availability, education level, attitude towards risk, perception regarding loan repayment, borrowing procedures credit information and so on.

However, little was known about credit access by small- and medium-scale food processors. The goal of the agricultural sector is “increasing and diversifying agricultural production and productivity so as to raise the share of its contribution to GDP”, Zambia's Sixth National Development Plan (SNDP) recognizes agricultural processing as key among other strategies for achieving the aforementioned goal. However the dearth in knowledge of the socio-economic factors influencing access to credit by food processors, leads to misguided interventions that have little impact on the agro-processing subsector.

1.2 Objectives

1.2.1 Main objective

The main objective of the study was to identify the socio-economic factors influencing access to credit by small and medium scale food-processing firms.

1.2.1 Specific objectives

- I. To identify major credit sources available to food-processing firms
- II. To obtain a consolidated list of registered small and medium scale food processors
- III. To identify the socio-economic factors influencing access to credit by small- and Medium-scale food processing firms.

1.3 Rationale

Credit access plays an important role in supporting firms to improve their productivity and production. An improved credit financial system is therefore crucial in growth and poverty reduction in the nation. This study aimed to contribute to the debate on determinants of credit access. In addition, this study also contributed to the pool of literature on the role of credit in increasing agricultural productivity as a path way out of poverty and improvement in food security in the nation as a whole. The findings would help in designing specific strategies and programs that are aimed at improving food security of the nation. This will ultimately contribute to the achievement of the Sixth National Development Plan, in which agriculture is one of the priority sectors in achieving sustainable economic growth and reducing poverty in Zambia (MoFNP, 2011).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this section the literature relevant to this study was reviewed. Several studies on credit access had focused on the producers and had looked at determinants, constraints associated with access to credit and the impact of credit access to productivity, production and hence profitability. Other studies had focused on access to credit by minor, small and medium scale enterprises and had been centered on factors influencing access to credit and the associated constraints. Further the studies looked at the impact of credit on performance, literature revealed a dearth in knowledge in empirical evidence regarding access to credit by small and medium scale food processing firms. Sub-section 2.2 cover on empirical studies regarding access to credit by producers and its impact on performance. Sub section 2.3 cover access to and the impact of credit on MSMEs. We end this section by concluding on the above subject.

2.2 Access to credit by producers (farmers)

A number of studies related to credit access had been identified and had focused on the producers. Mohamed and Temu, 2008 used both primary and secondary data and econometric as well as descriptive statistics to analyze factors that determined access of rural household to formal credit in Zanzibar and to establish a link between access to credit and the adoption of technology under the prevailing Zanzibar conditions. The study found a number of socio-economic factors that had an effect on access to formal credit, these factors were: the number of accesses to credit, the possibility of keeping livestock, having a bank account, the value of productive assets owned, household income and the intensity of adoption of agricultural technologies. Sarap, (1990) looked at inhibiting factors to credit access. The survey data confirmed a correlation between higher overall transaction costs and smaller farm size, and also between arrearages and larger farm size. Another study sought to determine the level of access to credit financial services, secondly establish factors that affect smallholder famers' access to credit financial services and the associated constraints (Kiplimo, 2013). The study established a significant effect by factors such as education level, extension services and occupation on a farmer's access to credit.

Mpuga, (2008) used the Uganda household surveys conducted in 1992/93 and 1999/2000 to shed some light on access to, and the characteristics of demand for credit among the rural population.

The study employed probit, Tobit and multinomial logit model estimations to analyze demand for credit. The study found age, education, gender, and marital status, type of industry, distance and collateral availability as significant in influencing access to credit by rural household population. In a more similar study Etonihu et al. 2013, found education, distance to source of credit and types of credit source as significant in influencing access to credit. Chauke et al. 2013 employed the logistic regression model in analyzing factors influencing access to credit. Factors that contributed significantly to credit access were the need for credit, attitude towards risk, distance between lender and borrower, perception on loan repayment, perception on lending procedures and total value of assets.

Nimoh *et al.* 2012 investigated the factors influencing poultry farmers' access to credit with particular reference to the Agricultural Development Bank (ADB) in the Ga-East Municipality. Estimates of the probit model revealed that age, FBO association, market turnover and secondary occupation(s) of poultry farmers significantly affected the use of ADB's credit. Other variables such as years of experience and credit history of farmers did not significantly affect the use of ADB's credit.

Farm credit can stimulate the transfer of technology into agriculture and hence lead to increased crop yield. However, most often than not farmers are faced with the problem of loans received being far lower than what they applied for. Acquah and Addo, (2012) analyzed the size of loan applied for and received, identified the constraints regarding loan obtainment and analyzed the socioeconomic determinants of farmers' loan size. The size of loan received by farmers was far lower and significantly different from the amount applied for. Empirical results from the regression analysis found the farm size, income and years of farming experience as positive and significant predictors of farm loan size.

Eustacius et al.1995, focused on the supply side by studying factors affecting commercial bank lending to agriculture. A Tobit econometric procedure was used to examine the effect of selected demand and supply factors on non-real estate agricultural lending by commercial banks in Texas. Studies which focused on the producers and were centered on the impact of credit access on performance include Wanyama, et al.2005, analyzed the impact of access and use of informal credit on agricultural productivity. The impact of access to credit was estimated using descriptive statistics and Heckman 2-stage regression model. The significant factors influencing borrowing were farm

size education and interest rate. Results also revealed that access to credit increases adoption of agricultural innovation among credit constrained households

2.3 Access to credit by enterprises

Aryeetey et al. 1994 investigated the apparent contradiction between the high propensity of small- and medium-sized enterprises (SMEs) to identify finance as their primary constraint and the view of banks that SME lending remains low in part for lack of bankable demand. Surveys were conducted of relatively successful microenterprises and SMEs to assess demand and sources of finance, and formal and informal financial institutions were interviewed to analyze constraints on the supply side. The results of the study showed that credit for start-ups was rare and that the smaller the enterprise, the greater the equity finance shares of the initial investment. They further noted that Many SMEs achieved substantial growth through reinvestment of profits, making it difficult to conclude that entry and growth of SMEs depended crucially on loans. Other forms of finance, such as customers' advances and supplier's credit were at least as important as bank credit.

Adade, 2012 examined the effect of credit access on SMEs' growth by employing both survey and econometric methods. Both econometric and survey approaches showed a significant relationship between access to credit and growth of the business. Franca, (2013) examined the effect of microcredit institutions on the development of small and medium scale enterprises (SMEs) in Anambra State was aimed at determining the impact of microcredit institutions in starting up, survival and growth of SMEs as well as the effect of collateral requirements in obtaining loans from microcredit institution in Anambra South and North senatorial district of Anambra. He noted a significant relationship between microcredit institutions and SMEs development. It was observed that 18.08 percent of success in starting up SMEs is attributable to microcredit institutions while 22.38 percent and 16.69 percent of SMEs survival and growth respectively were associated with microcredit institutions. Collateral requirement had about 34.35 percent effect in obtaining microcredit.

Using data from US manufacturing companies, Bernstein and Nadiri (1993) estimated the effect of financial structure on productivity and growth. They focused on estimating the impact of agency cost of debt and the signaling benefits of dividends on productivity growth. Nickell and Nicholitsas (1999) found that financial pressure (defined as the ratio of interest payments to cash flow) had a positive effect on productivity. They dealt with endogeneity of financial pressure by using

instruments of lagged debt burden and yield on treasury bonds. Schiantarelli and Sembenelli (1999) showed that firms with a larger proportion of long-term debt in their capital structure had improved subsequent performance measured as profitability, sales growth and TFP in samples of UK and Italian firms. Similar patterns were found in Schiantarelli and Jaramillo (1999) for Ecuador and in Schiantarelli and Srivastava (1999) for India.

2.4 Models used for analysing access to and Constraints in credit access

The models commonly used for analyzing access to credit included binomial logistic regression (Ololade and Olagunju, 2013; Akinbode 2013; Ibrahim and Bauer, 2013; Chauke et al. 2013). In addition Akibonde (2013) used the ordinary least squares (OLS) to estimate the coefficients. Hazarika and Alwang , (2003); Etonihu et al. 2013 employed linear regression. Others are Mpuga, (2008); Eustacious et al. (1995); Nimoh et al.(2013) who employed Probit, tobit and multinomial logit models, Switching regression model (Guirkingner and Boucher, 2008). Wanyama et al. (2005) employed Heckman 2-stage regression model in estimating the effects of the independent variables.

2.5. Conclusion

From literature above, it was clear that most studies on credit access focused on the producer and were centered on determinants and the impact of credit on performance. Other studies focused on access to credit by MSMEs and its impact on performance. Some of the common determinants of access to credit identified include collateral availability, interest rate, distance from credit source, borrowing procedures, attitude towards risk and perception of loan repayment. Therefore, there is still a dearth in knowledge with regards to socio-economic factors influencing access to credit by small and medium scale food processors. Finally, it was clear enough that the most widely used methods credit access assessment are multiple regression analysis, binomial and Multinomial logit model, Probit, and tobit model.

2.6 Conceptual Framework

Like any other service/product, the demand for credit was likely to be affected by its own price, which in the case of credit is the interest rate charged. Holding other factors constant, the higher the interest rate charged, the lower the demand for credit. In addition to the interest, there are other charges such as commitment fee that may be imposed on the loan recipient. Availability of the financial institution can be an important determinant of the demand for credit. Following the supply-leading hypothesis of financial services and the popular Say's law—'Supply creates its own demand'—availability of given financial institutions may stir up demand for their services, for example credit and savings. Distance to the financial institution is another candidate for the supply-side factors in the estimate of demand for credit. To develop a model of the determinants of an individual/household demand/ firm for credit, we start from the theory of producer behavior. Demand for credit is defined as the probability that an individual owner of the firm answered yes to the question 'did you apply for credit in the last 12 months (before the survey)?'

2.6.1 Logistic regression

According to Wooldridge (2009), the logistic regression coefficient can be used to estimate odds ratios for each of the independent variables in the model. The logistic regression model (logit model) is applicable to a broader range of research situations than discriminant analysis. The term "logit" refers to the natural logarithm of the odds (log odds) which indicates the probability of falling into one of two categories on some variable of interest (Wooldridge, 2009). According to Harrell (2001), binary logit has only two categories in the response variable, that is, event A and non-event A. Harrell (2001) also asserts that the model shows how a set of predictor (explanatory) variables (X 's) are related to a dichotomous response variable Y ($\ln(P_i/1 - P_i)$). The dichotomous response variable $Y = 0$ or 1 with $Y=1$ denotes the occurrence of the event of interest while $Y=0$ denotes otherwise. The dummy variables, also known as indicators and bound variables, characterize dichotomous responses. In this study, since only two options were available, namely "access to credit" or "no access to credit" a binary model was set up to define $Y=1$ for situation where the respondent accessed credit and $Y=0$ for situations where the respondent did not access credit from either formal or informal credit sources.

Assuming that \mathbf{X} is a vector of explanatory variables and p is the probability that $Y=1$, two probabilistic relationships as stated by Wooldridge (2009) can be considered as follows:

$$P(Y = 1) = \frac{e^{BX}}{1+e^{BX}} \tag{1}$$

$$p(Y = 1) = \frac{1-e^{BX}}{1+e^{BX}} = \frac{1}{1+e^{BX}} \tag{2}$$

Woodridge (2009) concluded that since Equation (2) is the lower response level, that is, the probability that a respondent did not access credit from formal and informal credit source, this will be the probability to be modelled by the logistic procedure by convention. Both equations present the outcome of the logit transformation of the odds ratios which can alternatively be represented as:

$$Logit[\theta(x)] = log\left(\frac{\theta(x)}{1-\theta(x)}\right) = a + b_1x_1 + b_2x_2 \dots \dots \dots b_kx_k \tag{3}$$

and thus allowing its estimation as a linear model for which the following definitions apply: θ = logit transformation of the odds ratio; a = the intercept term of the model; B = the regression coefficient or slope of the individual predictor (or explanatory) variables modelled and X_i = the explanatory or predictor variables.

2.6.2 Credit

The word ‘credit has been given several and varying number of meanings, some people refer to it as ‘loan’ while others used the term ‘borrow’ to qualify credit. Pischieet al. (1983), defined credit as a loan able fund which permits the purchasing of services, money or goods in the present, based upon the promise to pay for time at some time in future. From this it can be inferred that credit provide the means for the temporary transfer of assets or the use of such assets from a man or organization that has them, to a man or organization that has not.

Baker and Hopkins (1979), however, made a clear distinction between credit and loan. He referred to credit as an assets or a financial reserve which the farmers can call upon when needed provided he has not used his credit 'asset' by exchanging it for a loan. When a farmer makes the exchange of his credit for a loan, then he starts incurring an interest charge, also he uses up part of his capacity and hence part of his ability to acquire additional liquidity in the future by borrowing.

Olajide (1981), defined credit as 'monetary' or financial aspect of capital resources: capital resources being broadly defined as goods employed but necessarily used up to the course of production. They went further to indicate that, it can take the form of: Money in cash or bank over drafts or in kind as forms of biological and physical capital purchase and supplied producers. Adegeye and Dittoh (1985), defined credit as the process of obtaining control over the use of money, goods and services in exchange for a promise to repay at a future date.

A credit transaction often requires the provision of some evidence of debt obligation in return for a loan, except in case of transaction between friends or relatives where loans was given based solely on good reputation and financial position of borrowers. Evidence may take the form of mortgage on land, or buildings and pledging of trees or food crops (Adegboye, 1989).

Miller (1975) defines credit as a device for facilitating the temporary transfer of purchasing power from one individual or organization to another. Credits provide the basis for increased production and efficiency through specialization of function. Thus the skilled farm manager with small financial resources may be brought together with those with substantial financial resources but who lack farm management ability. The product of such a union will be more productive than the individual elements operating separately.

2. 6.3, Small and medium scale firms

In attempting to conceptualize small and medium enterprises (SMEs), some points need to be stressed. First, there is no generally accepted definition of small or medium businesses because of the classification of businesses into large, medium or small scale being subjective and qualitative judgment (Ogboru, 2007). Secondly, small businesses are generally quite responsive to their environment and our environment changes fast. Changes in the environment therefore affect what constitutes a small business at a particular point in time. Thirdly, what the definition aims at is to set

some limits (lower and upper) that will assist in achieving the set purpose. Such limits can be in terms of level of capitalization, sales volume, number of employees, etc. A clear definition may be useful in a particular national context but it may not be practical to attempt a universal definition. An attempt is made to present some definitions of SMEs to demonstrate the divergence in definition across countries.

A small-scale enterprise is a business that employs a small number of workers and does not have a high volume of sales. Such enterprises are generally privately owned and operated sole proprietorships, corporations or partnerships. The legal definition of a small-scale enterprise varies by industry and country (Gustafson, 2003).

The U.S. Small Business Administration states that small-scale enterprises generally have fewer than 500 employees within a 12-month period in non-manufacturing industries. A company must consider any individual on its payroll as an employee. In Australia, however, a small-scale enterprise is one that has fewer than 15 employees on payroll, as defined by the Fair Work Act. The Small Business Act for Europe states that small enterprises are those that have 250 employees or less. Small-scale enterprises in Asian countries generally have 100 or fewer employees, while small-scale African enterprises hire 50 or fewer workers.

Small-scale enterprises exist in almost every industry. They can range from mom-and-pop convenience stores to small manufacturing plants. Additional types of small-scale enterprises can include privately owned restaurants, law firms, inns, bakeries, architectural and engineering firms, dry cleaners and construction contractors.

The operational definition of SMEs for this study is the one by Osei et al. (1993). They used employment in defining SMEs. Osei et al classified SMEs into four main categories; micro enterprises are those that employ less than 6 people; (ii) very small enterprises constitute those employing 6-9 workers; small enterprises are business units that employ between 10 and 29 employees while medium sized enterprises are those that employ between 29 to 50 people. Hence, for this study, SMEs are enterprises that employ not more than 50 people. The choice of this definition is reflective of the situation in Zambia and allows for a wider inclusion of many enterprises in the study.

2.6.4 Agro-processing

Sinha and Mishra (2009) defined Agro-processing as set of techno-economic activities, applied to all the produces, originating from agricultural farm, livestock , aquaculture sources and forests for their conservation, handling and value-addition to make them usable as food, feed, fibre, fuel or industrial raw materials. Agro processing sector has experienced expansion during last 5 decades, starting with a handful of facilities which were mainly operating at domestic/cottage level. They further noted agro-processing industry, thus, encompasses all operations from the stage of harvest till the material reaches the end users in the desired form, packaging, quantity, quality and price. Ancient Indian scriptures contain vivid account of the postharvest and processing practices for preservation and processing of agricultural produce for food and medicinal uses. Inadequate attentions to the agro-processing sector in the past have put both the producer and the consumer at a disadvantage affecting the economy of the Country as a whole.

Mhazo et al. (2012) divide agro-processing at two levels i.e. primary and secondary levels. They state that agro-processing activities comprise two major categories; primary and secondary operations. Primary processing operations involve activities such as crop drying, shelling/threshing, cleaning, grading, and packaging. These activities are mainly carried out at the farm and only transform the commodity into a slightly different form prior to storage, marketing or further processing. Secondary processing operations entail increasing nutritional or market value of the commodity and the physical form or appearance of the commodity is often totally changed from the original. Some examples of secondary processing are milling grain into flour, grinding groundnuts into peanut butter, pressing oil out of vegetable seeds, pressing juice out of fruit, making cheese out of milk and manufacturing of mincemeat. Depending on type of commodity, equipment needed for primary processing is completely different from that used in secondary processing or major adjustments/modifications need to be done to suit either.

CHAPTER THREE

METHODS AND PROCEDURES

3.1 Empirical Model

3.1.1 Binomial Logistic Regression

The study used the logit model to analyse socio-economic factors that influenced access to credit by small and medium scale food processors. Based on the theory and model by Woodridge outlined above, a binomial logistic regression model was used given that the dependent variable was dichotomous: when a food-processor had no access to credit 0 and 1 when they had access to credit. Predictor variables were a set of socio-economic factors of food-processors. They contained both dichotomous and continuous variables. P denoted the probability that a given food processor had access to credit. It was assumed that P was a Bernouli variable and its distribution depended on the vector of predictors X, so that:

$$\ln \left(\frac{p}{1-p} \right) = a + Bx \tag{4}$$

$$\text{or } \frac{p}{1-p} = e^{a+Bx} \tag{5}$$

Where:

“ln” is the natural logarithm, \log_{\exp} , where e=2.71828

“p” is the probability that Y for cases equals 1, p (Y=1)

“1-p” is the probability that Y for cases equals 0,

1 – p(Y=1)

“p/(1-p)” is the odds

ln [p/1-p] is the log odds, or “logit”

The logit function to be estimated is then written as:

$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \dots + \beta_n X_n \quad (6)$$

The logit variable $\ln\{P/(1-P)\}$ is the natural log of the odds in favour of the food-processor having access to credit. Equation iii was estimated by maximum likelihood method and the procedure did not require assumptions of normality or homoscedasticity of errors in predictor variables. The X_s in the equation above represented the social economic factors of small and medium scale food-processors. . These factors included: proxies to measure human capital such as education, marital status, food processor's sex and age; physical assets such ownership of a house, land as proxies for collateral, distance from credit source, interest rate, age of the firm, credit acquisition procedures, attitude towards risk, lack of information, terms of credit, credit source, perception of loan repayment. On the other hand the betas were the marginal effects associated with respective X_s . The explained variable (Y) was access to credit.

3.2 Study area

The study was conducted in Lusaka district. Lusaka district was chosen as the study area as it had a number of small and medium scale agro-processors involved in food processing. The incentive of most agro-processors being in Lusaka district was as a result of a readily available market of the output for the industry and a central place for accessing raw materials. Since this study would focus on the food processors, Lusaka was therefore a suitable study area.

Lusaka is the capital and largest city of Zambia. One of the fastest-developing cities in Southern Africa, Lusaka is located in the southern part of the central plateau at an elevation of about 1,300 metres (4,265 feet). As of 2010, the city's population was about 1.7 million. Lusaka is the centre of both commerce and government in Zambia and connected to the country's four main highways heading north, south, east and west. English was the official language of the city, but Nyanja, and Bemba are also common.

3.3 Sampling technique

The study was based on food processors that were registered with Zambia chamber of small and medium businesses association and Technoserve Zambia. 100 food processors were sampled from those who are registered using simple random sampling. This was done using excel spread sheet.

3.4 Data collection and analysis

Primary data was used in this study. The data was collected using a well-structured pretested questionnaire. The questionnaires were administered to the owners and managers of the food-processing firms. 58 SMEs food processors were successfully interviewed. Various analytical techniques were used for this study. Descriptive statistical tools were used to analyse the socio-economic characteristics of the food-processors and constraints they faced in credit acquisition using statistical package for social sciences (SPSS) and Excel. The processors' access to credit was conceptualized to involve either access to credit or no-access to credit. Binomial Logic Regression model was used because the dependent variable was a dummy variable. This was successfully done and accomplished using STATA.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This section consists of the findings of the study as well as their interpretations. In order for us to understand factors influencing access to credit by small and medium scale food processors, this section starts with a description the proprietor’s and the company characteristics, and finally a discussion of the logistic regression findings.

4.2 Proprietors’ characteristics

There are more male food processors in the processing business. Male processors account for 62.07 percent while female only account for 32.76 percent of the total food processors. Therefore food processing is dominated by males.

Table 1; Proprietors’ characteristics

Characteristic	Average/percentage
Proportion of males	62.07%
Age of the proprietor	45.47
Proportion of proprietor’s who are married	81%
Proportion of proprietor’s who attained tertiary education	54%
Proportion of proprietor’s who attained senior secondary education	34%

Source: Analysis (2014)

Most of food processors were married taking up a share of 81 percent of the total number of food processors, this is followed by those that were divorced and are represented by 5 percent. The widows and widowers take up 3 percent and the rest are those that were separated and they represent 3 percent of the proprietors.

On average, most food processors attained tertiary education (54 percent), 34 percent of the food processors attained senior secondary, with close to 2 percent and slightly above 3 percent who attained primary and junior secondary school education respectively. It therefore implies that most of the food processors are literate.

4.3 Company background information

Most of the food processing businesses have been in operation between 1 and 5 years from inception representing 68.97 percent. This is seconded those who have been operating between 6 and 10 years. The rest have been in business for 11 to 15 years (5 percent) and 1 percent representing those who have been operating for 16 years and above. This shows a direct relationship between duration in business and the size of a business. See table 2.

Table 2; company information

Characteristic	percentage
Business duration in years;	
1-5	69
6-10	24
11-15	5
16 and above	1
Employee size;	
0-10	50
11-20	34
21-30	3.4
31 and above	12

Source: Analysis (2014)

About half the food processors have employees ranging from none to 10 people, followed by those who have employees ranging from 11 to 20, represents slightly above 30 percent. The rest had employees ranging from 21 to 30 and 31 and above, representing about 3 and 12 percent respectively. It therefore implies that most of the food processing firms are in their micro and small scale stage as indicated by Osei et al. (1993). Table 2 summarises the employee size information.

Food processing was found to have a diversity of food types that were being processed into various forms like snacks, relishes, butter, juices creams and other forms. The majority of the food processors were found to be involved in oil seeds processing (49.2 percent) followed by those who were in vegetable processing (27.1 percent). Milk was found to be processed by a few i.e. 1.0 percent. This information is summarised in table 3.

Table 3: Commodities Processed

Processing unit	count	percentage
Vegetable	16	27.1
Oil seeds	29	49.2
Fruits	5	8.5
Livestock	11	18.6
Milk	1	1.7
Cereal	9	15.3
Flour	6	10.2
Honey	8	13.6

Source: Analysis Results (2014)

The SMEs food processing was dominated by sole proprietorship represented by 58.62 percent the rest were partnerships and limited liability companies (privately traded) , represented by 36.21 and 5.17 respectively. This is illustrated in table 4.

Table 4: Business ownership type

Ownership type	count	Percent	Cum.
Sole proprietorship	34	58.62	58.62
Partnership with few individuals	21	36.21	94.83
Limited liability company, not publicly	3	5.17	100.00
Total	58	100.00	

Source: Analysis (2014)

The Commercial Banks were observed to be a common source of credit for SMEs food processors. This represented by 34.80 percent out of the total. Close to 14 percent of the food processors obtained credit from Microfinance inclusive of those who did not obtain credit. This is summarised in table 5.

Table 5: Sources of credit

Source	Count	Percentage
Commercial bank	20	34.80
Microfinance	8	13.79
Government	5	8.62
Fellow processors	1	1.72

Source: Analysis (2014)

4.4 Interpretation of logistic regression results

Generally, log likelihood function value of -11.92 a pseudo R^2 of 0.66 and a chi-square value of 45.64 which was significant and positive at 1% showing the goodness of fit of the model . In table 6 Variables that significantly and positively influence access to credit includes, tertiary education, land and a house as collateral. Coefficient of years of formal education was significant and positive; this implies that educated food processors are more likely to access credit than their uneducated counterparts. This may be attributed to the fact that the more educated a given food processor is the more they are likely to understand the credit market and follow the laid down procedures and rules governing the market. Food Processors who own land or house(s) are more likely to access credit than those who do not own land or a house (see table 6). Formal credit market players demand that the borrower possesses some land a house or some other reliable equipment that could be used as collateral. Land or buildings are continuously gaining value unlike other assets that lose value due to wear and tear. It is therefore common to find that lenders would demand land or a house as collateral. Being in a partnership negatively influences the likelihood of a given firm to access credit. This may be attributed to the fact partnership may not be efficient due to dependence as regards to paying back the credit in question. A similar situation is observed on those who are in cereal processing. Due to readily available raw materials in large quantities and technology in cereal processing, there is more competition in this particular processing sector compared to perishables like vegetables for example, hence this tends to affect the income realised from such undertakings and hence profits which in turn negatively affect the ability to pay back the loan. Male food processors are less likely to access credit compared to their female counterparts.

Table 6. regression results

VARIABLES	(1) CREDIT SUCCESS
<i>Asset ownership</i>	
Land, 1=yes	14.76* (7.552)
House, 1=yes	16.89** (8.580)
<i>Type of ownership (base = sole proprietorship)</i>	
Limited Liability as a form of ownership 1=yes	-8.255 (14.64)

Partnership as a form of ownership 1=yes	-9.173*
	(4.938)
Tertiary-level education, 1=yes	16.40**
	(7.522)
<i>Marital status (base = single)</i>	
Widow 1=yes	7.057
	(6.300)
Married 1=yes	-7.270
	(5.012)
Sex of the proprietor, 1=male	-4.955**
	(2.352)
Age of the proprietor in years	-0.451*
	(0.248)
<i>Agricultural commodity processed</i>	
Vegetable processor 1=yes	0.697
	(2.427)
Oilseeds Processor 1=yes	-2.806
	(3.199)
Livestock Processor 1=yes	-1.709
	(2.746)
Cereal Processor 1=yes	-15.51*
	(8.164)
Flour Processor 1=yes	6.789
	(8.066)
Honey processor 1=yes	3.951
	(2.897)
Years of business	0.0195
	(0.273)
Number of employees	0.0687
	(0.115)
<i>Purpose of credit</i>	
Credit for refinancing 1=yes	4.776
	(4.046)
Credit for capital investment 1=yes	-1.244
	(3.983)
Credit for hiring employees 1=yes	1.858
	(1.853)
Constant	12.54
	(26.00)

Observations	57
LR chi2(20)	45.64
Prob > chi2	0.0009
Pseudo R2	0.6570

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The main objective of this study was to ascertain the socio-economic factors influencing access to credit by small and medium scale Food Processors in Zambia's Lusaka District. Simple random sampling was used to select the respondents in the study area. Descriptive statistics were done using SPSS while logistic regression was used to analyse data for the socio-economic factors influencing access to credit by SMEs food processors. The study revealed that commercial Banks and microfinance are a common source of credit for small and medium scale food processors. Factors that significantly and positively influenced access to credit include tertiary education, land and house as the requirement for collateral. On the other hand, factors significantly and negatively influencing access to credit by SMEs Food Processors include sex, partnership as a form of ownership the age of the proprietor and being a cereal processor finally age was also found to have a negative influence on credit accessibility. This implies that the older a given food processor gets the less likely of them accessing credit.

5.2 Recommendations

Evidence presented in this study raises critical issues that need to be considered in addressing the challenges that food processors face in accessing credit. There is need for the government to consider investing in both formal education such as improving infrastructure and the associated services like information dissemination regarding ways of accessing credit need to be stepped up by both financial institutions and the public sector. The government should consider pursuing policies that are aimed at providing an equal opportunity for its people to access land as these would allow them to have collateral which could be used for obtaining credit. Concerted effort is also needed for the government to work hand in hand with financial institutions to develop a suitable environment for SME food processors. There is need also to form coordinated linkages through Market Associations to enhance trusts and mutual relationships between financial institutions and the food processor

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Appendix 1 questionnaire

A. Proprietor information

1. Proprietor's marital status
1 = Single 2 = Married 3 = Separated 4 = Divorced 5 = Widowed|____|
2. Proprietor's sex
1 = Male 2 = Female1. |____|
3. Proprietor's date of birth (DD/MM/YYYY) |____|____| / ____|____| / ____|____|____|____|
4. Proprietor's age in years |____|____|
5. Level of education attained |____|
- 1 = No Education 2 = Primary 3 = Junior School 4 = Secondary School 5 = Tertiary

A. Company background information

- 1) Company (business's) name _____
- 2) Location (within Lusaka) _____
- 3) What is the current ownership/equity situation (choose only one): ☐
- 1=sole proprietorship 2=partnership with few other individuals 3=limited liability company, not publicly traded 4=limited liability company, publicly traded 5=other (specify) _____
- 4) Do you process? (1=Yes; 2=No):
- | | |
|--|--------------------------|
| a. Vegetables e.g. tomatoes, green beans, | <input type="checkbox"/> |
| b. Oil seeds (e.g. soybean, groundnuts) | <input type="checkbox"/> |
| c. Fruits e.g. bananas, oranges | <input type="checkbox"/> |
| d. Livestock e.g. chicken, cattle meat | <input type="checkbox"/> |
| e. Milk | <input type="checkbox"/> |
| f. Cereals/tubers e.g. maize, wheat, potatoes, cassava | <input type="checkbox"/> |
| g. Flour | <input type="checkbox"/> |
| h. Honey | <input type="checkbox"/> |
| i. other (specify) | _____ |

5) How long have you been in the processing business (months)? months
 years

6) How many employees are in this business?

7) Is the business affiliated to; (1=Yes 2= No)

a. ZCSMBA,

b. ZAM?

c. Technoserve

d. Other(s) specify _____

B. Access to credit/loan/finance

1. What type of equity financing has your enterprise received since (and including) start-up (1=yes 2=no) (write the applicable):

a. Founder's own funds

b. Funds from spouses or life partners

c. Funds from other family members

d. Funds from other individuals excluding business angels

e. Other companies

f. Government funds

g. Venture capitalists

h. Business angels

i. Other (s) specify _____

2. Have you ever applied for any credit/loan? (1= yes, 2=no)

3. How many times have you applied for a loan?

4. What kind(s) of collateral/security do you have on your disposal?

1=none 2=Livestock 3=House 4= Machinery 5=Group guarantee 6=Land

Other (specify) _____

4. If **YES** to 2 (above) where did you apply for this credit/loan (1= yes, 2=no)

a. Commercial Bank e.g. Zanaco, Barclays, Finance etc.

b. A microfinance e.g. Bayport, FINCA Zambia ltd

- c. The government (CEEC) ☐
- d. Business partners (e.g. fellow food processors) ☐
- e. Family ☐
- f. Friend(s) ☐
- g. Other (specify) _____

6. If yes to 2 (above) did the business obtain the loan successfully? (1= Yes, 2=No) ☐

7. If yes to 2 (above), for what **PRIMARY** purpose does your business use credit/loan?
(1= Yes, 2=No)

- a. Refinance or pay down debt ☐
- b. Capital investment(acquiring new machinery) ☐
- c. Hire employees ☐
- d. Real estate investment ☐
- e. Fulfill existing business contracts ☐
- f. Launch new product/service ☐
- g. Manage cash flow / operating expenses ☐

h. Other, please specify _____

8. Why did you **not apply for a loan** (1= yes, 2=no)

- a. I do not know where and how it is done ☐
- b. The business does not need credit/a loan ☐
- c. interest rates are too high ☐
- d. Lack of assets to use as collateral ☐
- e. Complicated procedures involved in credit/loan acquisition ☐
- f. Credit providers/ sources are too far ☐
- g. Terms of credit/loan are not conducive ☐
- h. Paying back is a challenge ☐
- i. It is a risky undertaking ☐

j. Other(s) specify _____

End – Thank you for your cooperation!