THE EFFECT OF INCENTIVE-BASED RISK MANAGEMENT ON LENDING TO AGRICULTURE SECTOR IN KENYA

BY

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DECLARATION

This research project is my original work and has not been presented for an award of a degree in any university or institution of higher learning.

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DEDICATION

I dedicate this research project to my lovely friend Mr. Roger Stoakley and Mrs. Mie from UK who has tremendously contributed with the help of The Almighty God to what I am today.

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LIST OF ABBREVIATIONS

AFDB: African Development Bank

AGRA: Alliance for a Green Revolution in Africa

CBK: Central Bank of Kenya.

FAO: Food and Agricultural Organization.

MSA: Metropolitan Statistical Area.

IBRD: International Bank for Reconstruction and Development.

IFC   :   International Finance Corporation.

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ABSTRACT

A strong and efficient agricultural sector has a potential to enable a country feed its growing population, generate employment, earn foreign exchange and provide raw materials for country. it is however, that despite the great potentials that Kenya has in agricultural production, the country is a net importer of food. The major bane of Kenya's agricultural development cited in the literature is low investment or credit. Financial services providers, including commercial banks in Kenya, generally view financing smallholder farmers as a high risk investment. Few banks accept farmers' assets as collateral, and those that are willing to provide smallholder with loans charge very high interest rates, making it both difficult and appealing for farmers to invest in upgrading their operations. It is on the above reasons that this study investigated the effect of incentive-based risk management on lending to agriculture sector in Kenya. The lending to agriculture sector model was estimated using ordinal data. Both secondary data and primary data were used. Primary data was collected using closed ended questionnaire from a population of 43 commercial banks registered by central bank of Kenya. The collected data was analyzed by descriptive statistics. The data from questionnaire was coded and captured using Statistical Package for Social science (SPSS version 20.0). The findings revealed that incentive-based risk management expands lending to agriculture sector in Kenya. All the three independent variables-incentive-based risk management, banks' market and bank's size have positive impact on lending to agriculture sector in Kenya. The incentive-based risk management has the highest impact and influence on lending behavior of commercial banks and a change in it will yield the highest change in lending to agriculture sector in Kenya. The study therefore, recommends that banks and the government should strive to maintain incentive-based-risk management approaches efficiently so that their objectives of banks' profitability and farmers' benefits are achieved and multipliers effects maintained to the maximum. The study recommends further, that, the government should play a vital role by establishing a conducive environment characterized by favorable macroeconomic policies, adequate infrastructure, a strong human capital base, competent government administration, and political stability. This will mobilize effectively the creativity, drive, and resources of the private sector.

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CHAPTER ONE

INTRODUCTION

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1.1 Background of the Study

Recent global developments have triggered a surge in investment in African agriculture. Efforts are being made to raise investments levels in Agriculture to help address global and regional concerns for food, industry and fuel. Drivers of investments in agriculture includes: i) the regional global population expected to reach 9 billion by 2050, with Kenya population expected to be more than 40 million, resulting in rising incomes , higher expenditures on foodstuffs and demand for higher value agricultural commodities, ii) biofuel initiatives around the world, which have resulted in a spate of investments in developing countries to grow sugarcane, grains (such as maize and oilseeds (such as soya beans), as well as non-food crops, iii) the rapid rise in food prices, with subsequent shortages in commodities such as rice and restrictions on exports of these products by some developing-country governments, has spawned new investors in agriculture. A March 2014 report entitled Human capital for Africa, states: "Africa's leaders see agriculture as an engine for overall economic development; in sub-Saharan Africa it contributes 32 percent of gross domestic product and 65 percent of employment. Growth in agriculture is twice to four times as effective in reducing poverty as other sectors but is held back by lack of qualified professionals.

1.1.1 Incentive-Based Risk Management

Incentive-based risk management is a dynamic, holistic approach that tackles both the agricultural value chain and the agricultural financing value chain. It does two things at once:

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fixes the agricultural value chain so that banks can lend with confidence to the sector; and, encourages banks to lend to the agricultural value by offering them strong incentives and technical assistance. Incentive-based risk management, unlike other risk mitigation systems which encouraged banks to lend without clear strategy to the entire spectrum of the agriculture value chain, emphasizes lending to the value chain and to all sizes of producers.

According to Mukonyora (2013), IBRM is an integrated package of de-risking solutions comprising risk sharing instruments, insurance facility, technical assistance, and a bank incentive. The approach aims at transforming public capital into productive capital-capital that is used to realign incentives for private sector investments to the agriculture sector, meet and increase the market absorptive capacity, reduce the risks of lending, reduce learning curves for the financial players for understanding the sector and build their capacity to develop more appropriate and affordable loan products for smallholder farmers and businesses, and develop efficient financial delivery systems that serve the needs of all farmers.

1.1.2 Lending

According to Levonian (1996), banks differ substantially in their agricultural lending. Most banks do none. Banks that are agricultural lenders vary in their degree of emphasis, with most doing little but some devolving 50 percent or more of their assets to farm loans. Possible explanation for such variation in the composition of bank loan portfolio are but not limited to: Bank's local market which is the single most important variable influencing agricultural lending; and size of bank, large banks are less likely to hold farm loans even if they have branches in agricultural areas. As an industry, agriculture is notably tied to particular, typically rural,

locations. Banks located in such areas might specialize in farm loans, while banks in urban areas might not.

Banks provide two broad types of agricultural credit: loans secured by agricultural real estate and other agricultural loans. Agricultural producers generally use loans secured by real estate to acquire physical capital, including land, equipment, and livestock. Nonbank lenders, especially insurance companies, are active competitors for this type of lending. Prices and quantities of loans secured by farm real estate depend heavily on land values and only indirectly on agricultural prices and output (Levonian, 1996). This study considers the second category, loans not secured by real estate; banks are the dominant supplier of such loans. These loans are referred to as agricultural production loans, generally financing variable production costs such as seed, fertilizer, labor, and other sections of the agricultural value chains. Demand for production loans is driven primarily by agricultural output. The loans tend to be shorter term and have a strong seasonal element. Production loans are viewed as an input to the production process.

1.1.3 Effect of Incentive-Based Risk Management on Lending

Expand agricultural Lending: According to Swinnen, Vandeplas & Maertens (2010), this approach integrates a set of factors that are essential for expanding agricultural lending so that the risks and capacity bottlenecks along the agricultural and financial value chains are simultaneously addressed. It is demand driven and uses customized risk-sharing instruments to allow banks and other financial actors to select the parts of the value chains they are most interested in for lending. The Value chain financing offers several advantages, including assured markets, guaranteed prices, reduction in market risks, sharing of risks in lending and input supply by all participants in the interlocked arrangements, positive spillover effects on other

crops, and increased and stable cash flows for farmers. According to Mukonyora (2013), IBRM aims at enabling financial value chain actors, to leverage more financing to the agriculture sector, especially to smallholder farmers. The initiative takes a more comprehensive development approach by having a de-risked incentivized financial value chain to support structured agricultural value chains.

Risk Management: According to Mukonyora (2013), IBRM is an integrated package of de-risking solutions comprising risk sharing instruments, insurance facility, technical assistance, and a bank incentive. The approach aims at transforming public capital into productive capital-capital that is used to realign incentives for private sector investments to the agriculture sector, meet and increase the market absorptive capacity, reduce the risks of lending, reduce learning curves for the financial players for understanding the sector and build their capacity to develop more appropriate and affordable loan products for smallholder farmers and businesses, and develop efficient financial delivery systems that serve the needs of all farmers.

1.1.4 Agricultural Industry in Kenya

The study focused on financing agricultural value chains in Kenya. According to Oluoch-Kosura, & Sikei (2013), as countries industrialize and seek to strengthen their positions in global markets, modern agricultural value chains grow and become more sophisticated. The private sector is involved in driving the value chains with the public sector just providing supportive roles. Of particular concern, though, has been how to ensure that scaled-up chains benefit the rural population, especially women involved in primary production. Most chains typically favor better-off farmers, processors, and traders while poor actors get squeezed out (Hartmann, 2012).

Most of the countries in Africa have well-developed value chain system for different agricultural commodities. Kenya has several companies with well-developed value chain systems, these include, but

not limited to dairy farming, horticulture companies, tea farming, Sugarcane farming, coffee farming, livestock farming, and cereals (maize, wheat, rice, beans) farming. Kenya, for instance, has one of the best horticultural value chains in the region, which has enabled it become a major player in the global market. Kenya's success mainly hinges on market segmentation, servicing niche markets, and investing in marketing (Webber & Labaste, 2010). Such best practices should be scaled-up or replicated to guarantee growth, competiveness, and prosperity.

1.2 Research Problem

Banks can and do invest in many different kinds of assets, including various types of loans. However, most do not invest in every type of asset available to them; they go through management decision processes that result in positive amounts of some and zero to others. In the case of agricultural lending, some banks invest in farm loans and others do not, despite the fact that the market areas of almost all banks include at least some agricultural production (Levonian, 1996). The banking industry in Africa and Kenya in particular forms a strategic hub of the financial system. Lending decisions by banks cannot be overlooked as they are the principal providers of funds to the governments, corporate bodies and individuals as a whole. This study, focused on bank lending decisions consistent with observation that most banks do low lending, and in which incentive-based risk management approaches, bank size and bank's market plays a role in determining lending behavior: whether or not a bank becomes involved in agricultural lending at all.

The study addressed the effect incentive-based risk management on lending to agricultural sector in Kenya. Other factors include bank size and the bank's market. The main components of IBRM are: De-risking the agricultural value chain, building long-term capacity, and institutionalising incentives for agricultural lending on lending to agriculture sector. De-risking the agricultural

value chain involves two aspects, which include risk-sharing approach on a win-win game-the government share with commercial banks losses on agricultural loans, and, insurance approach, which links insurance products to the loan provided by the banks to loan beneficiaries. Building long-term capacity covers: Building capacity of banks, microfinance institutions and agricultural value chain, and expanding financial inclusion. Institutionalising incentives deals with agricultural bank rating approach, this ranks banks according to their effectiveness of lending to agricultural lending and the social impact it make available to the public, and bank incentive mechanism which provide appropriate incentives to move banks to a strategic commitments to agricultural lending. The main objective of the research therefore, is to explain how banks can expand bank lending in agricultural value chains in Kenya.

A lot of studies have been done on lending to agricultural sector in developed economies such U.S.A. Gilbert and Belongia (1998) examined the effects of bank size and holding company affiliation on agricultural lending. Laderman, Schmidt, and Zimmerman (1991) looked at the effect of location on agricultural lending by banks. Whalen (1995) covered small agricultural loans as part of a more general analysis of small-business lending banks. And Cole (2008) integrated theories of political budget cycles with theories of tactical electoral redistribution to test for political capture in a novel way. Levonian (1996) examined the differences in farm lending among banks. This study intends to fill the gap and find evidence of the effect of IBRM on bank lending decision to agriculture sector in Kenya. The research was expected to bridge the gap of low funding in the agricultural value chain. Agricultural value chain in Kenya has experienced low funding. The gaps in the agricultural financing value chain include: low lending, low levels of loan distribution, insufficient insurance and low financial literacy. To address these issues require an innovative approach. The research was intended to address this

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problem. Unlike previous research that have been carried out on lending behavior by banks in agriculture sector, which encouraged banks to lend without clear strategy to the entire spectrum of the agricultural value chain, this research emphasized lending to the value chain and to all sizes of producers.

Locally, to the researcher's understanding, few studies have been done on lending to agriculture sector. Langat, (2012) examined the determinants of Lending to famers by commercial banks in Kenya. Based on this there was gab in literature that warrants a research to be conducted in this field. To put commercial bank at the center of sustainable agricultural growth, the study sought to determine the effect of IBRM on agricultural lending in Kenya. Specifically, the researcher intended to address the question: What is the effect of incentive-based risk management on lending to agricultural sector in Kenya?

1.3 Objective of the Study

To determine the effect of incentive-based risk management on lending to agriculture sector in Kenya.

1.4 Value of the Study

Lending decisions; the study intends to expand lending decisions by the banks. Banks do invest in many different kinds of assets, including various types of loans. However, most do not invest in every type of assets available to them; they go through management decision processes that result in positive amounts of some assets and zero to others. Thus the study will be critical in agricultural lending decisions.

Owing to the experiences of commercial bank lending practices to agriculture, enormous opportunities and challenges in agricultural sector, the research is intended to provide knowledge to the various actors of the agricultural value chains that will help in mitigating risks in agricultural lending and expand bank lending to agriculture that will put the commercial banks at the centre of sustainable agricultural growth in Kenya.

The research is also intended to benefit a wide scope of the various sectors of the economy. These sectors include: Banking sector that will make banks to capture latent profits in agricultural lending .The study will cause lenders to recognize the growing potential and profitability of lending to these "generally feared but little understood" agricultural enterprises ; agricultural sector, agricultural producers will have increased access to credit, and a strong agricultural sector hence enhanced food security. Policy makers will also benefit. The study will help policy makers to formulate the best policies on agricultural lending in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter focused on the literature review of the effect of incentive-based risk management on lending to agriculture sector. The chapter covered theoretical review, determinants of lending to agriculture sector, empirical review, and summary of Literature Review. This literature review was intended to put the research into its context and reveal what the problem it was attempting to address.

2.2 Theoretical Review

This section examined theories relating to bank lending. These theories include: Credit rating, signaling argument, firm characteristics, loan pricing theory, and Hold-up and Soft- Budget- Constraint theories

2.2.1 Credit Market Clearing (Neo-classical) Theory

Ewert et al (2000) postulates that if collateral and other pertinent restrictions remain given, then it is only the lending rate that determines the amount of credit that is dispensed by the banking sector. Therefore with an increasing demand for credit and a fixed supply of the same, interest rates will have to rise. Any additional risk to a project being funded by the bank should be reflected through a risk premium that is added to lending rate to match the increasing risk of default. Subsequently, there exist a positive relationship between the default probability of a borrower and the interest rate charged on the advance.

Although this theory does not explicitly discuss how collateral would impact on the risk premium, it creates the impression that collateral has no effect on lending rate, and if a risky borrower would wish to face the same lending rate as a borrower with a lower risk, then all that is required is to pledge more collateral to lower risk profile and therefore enjoy a lower risk premium. This brings about the "moral hazard" and "adverse selection" phenomena, firstly because of the information asymmetry existing between the lender and borrower. The borrower has a more accurate assessment of the risk profile of this investment that is not known by the lender and thus may perform secret actions to increase the risk of his investment without the realization of the lender. The adverse selection problem appears as lenders raise their interest rates to shield themselves from default and on the other hand attract only high risk borrowers and eliminate low risk borrowers.

2.2.2 Signaling Argument Theory

According to Chodecai (2004),the borrowers who always have private information will be forced to reveal (signal) their better quality through pledging of collateral to show their better status as opposed to lower quality borrowers. This is because in the absence of full information the bank is not able to assess the true quality of a borrower and may resort to credit rationing in an attempt to mitigate the problem of adverse selection. Pledging more collateral is therefore viewed by borrowers as a more credible signal of their commitment towards repayment of the advance amount. Lower quality buyers who have private information regarding the true risk profile of their investment will shy away from pledging valued collateral, since they privately know that there is a higher chance of losing it because they will be unable to service the loans. Higher premiums will be observed in borrowers pledging lower collateral while lower premiums will be

observed for borrower pledging more collateral. However, there is the adverse signaling theory and it postulates that firms perceived to be less risky will pledge low or not premium

2.2.3 Firm Characteristics Theory

According to Ewert, Schenk and zczensy (2000) "there are firm-specific agency problems that can be mitigated using collateral or such covenant and each firm chooses a financial contract that maximizes firm value by trading off additional bonding and monitoring costs against reductions in interest rate premiums". A firm-specific financial contract is thus made for each firm in question, and the use collateral by a specific firm can be observed to reduce the credit costs (high interest premiums). However, such conclusion will most likely not hold for many firms because, as mentioned before, there are high-risk firms that will offer valuable collateral and probably accept high premiums

Godlewiski & Ziane (2008) postulates that the number of borrowing relationships will be decreasing for small, high-quality informationally opaque and constraint firms, all other things being equal.

2.2.4 Loan Pricing Theory

Stigglitz and Weiss (1981) postulates that banks cannot always set high interest rates e.g. trying to earn maximum interest income. Banks should consider the problem of adverse selection and moral hazard since it is very difficult to forecast the borrower type at the start of the banking relationship. If banks set interest rates too high, they may include adverse selection problems because high-risk borrowers are willing to accept these high rates. Once these borrowers receive the loans, they may develop moral hazard behaviour or so called borrower moral hazard since they are likely to engage in highly risky projects or investments (Chodecai, 2004).

2.2.5 Hold-up and Soft- Budget-Constraint theories

Von Thadden (2004); Padilla and Pagano,(1997) postulates that banks choice of multiple-bank lending is in terms of two inefficiencies affecting exclusive bank-firm relationships, namely the hold-up and the soft-budget-constraint problems. According to the hold-up literature, sharing lending avoids the expropriation of informational rents. This improves firms' incentives to make proper investment choices and in turn it increases banks' profits. As for the soft-budget-constraint problem, multiple-bank lending enables banks not to extent further inefficient credit, thus reducing firms' strategic defaults. Both of these theories consider multiple-bank lending as a way for banks to commit towards entrepreneurs and improve their incentives. None of them, however, address how multiple-bank lending affects banks incentives to monitor, and thus can explain the apparent discrepancy between the widespread use of multiple-bank lending and the importance of bank monitoring. But according to Cartti et al (2006), when one consider explicitly banks incentives to monitor, multiple-bank lending may become an optimal way for banks with limited lending capacities to commit to higher monitoring levels. Despite involving free-riding and duplication of efforts, sharing lending allows banks to expand the number of loans and achieve greater diversification. This mitigates the agency problem between banks and depositors, and it improves banks' monitoring incentives. Thus, differently from the classical theory of banks as delegated monitors, their paper suggested that multiple-bank lending may positively affect overall monitoring and increase firms, future profitability.

2.3. Determinants of Lending to the Agricultural Sector

Lending Decisions: According to Levonian (1996), Banks can and do invest in many different kinds of assets, including various types of loans. However, most do not invest in every types of asset available to them; they go through management decision processes that result in positive amounts of some assets and zero of others. In the case of agricultural lending, some banks invest in farm loans and others do not, despite the fact that the market areas of almost all banks include at least some agricultural production.

To explain such a pattern, a bank sets a threshold T for agricultural lending. Independently of the threshold, the bank determines a profit-maximizing quantity of farm loans L, based partly on the demand for such loans. The bank then compares L to T; if L is at least as large as T, the bank holds farms loans in the amount L; otherwise, the bank holds no farm loans, thereby avoiding the costs of gearing up to manage such a specialized type of asset. Both T and L may depend partly on the characteristics of the bank and partly on the factors that are common to all banks in a particular market or region. However, while L depends on the demand for agricultural loans in the market, T does not; in essence, the bank sets a threshold, then looks around its markets to see if the quantities of lending it actually do would meet or exceed that threshold. Therefore, lending decision depends on:

2.3.1 The Bank's Market

The measure of the nature of any bank's market area can be based on the actual geographic distribution of its branches and the amount of agricultural activity in the branch locations. From a bank's perspective, a market is more agricultural if more of the loans in the market are used to finance agricultural production. Assume that agricultural loan demand in a county c at any point

in time is proportional to farm output as measured by total values of sales reported by farms in that county: LDc $=\gamma.Qc$. Where LD is loan demand, Q is farm output, and γ is a proportionality factor that may vary depending on bank interest rates and other factors. The larger a banks presence in highly agricultural areas, the more likely that the bank does at least some farm lending. This supports the hypothesis that a bank's decision to engage in a particular type of lending reflects the composition of its local markets (Levonian, 1996).

2.3.2 The Bank's Size

Bank size is considered as an important determinant of bank lending decision (Berger and Udell, 2006, Uchida et al.2007). Berger and Udell (2006) provide that large and complex banks tend to lend few loans to small scale firms.

2.3.3 Incentive-Based Risk Management

Expand agricultural Lending: According to Swinnen, Vandeplas & Maertens (2010), this approach integrates a set of factors that are essential for expanding agricultural lending so that the risks and capacity bottlenecks along the agricultural and financial value chains are simultaneously addressed. It is demand driven and uses customized risk-sharing instruments to allow banks and other financial actors to select the parts of the value chains they are most interested in for lending.

2.4 Empirical Review

Gilbert and Belongia (1998) examined the effect of bank size and holding company affiliation on agricultural lending. They attempted to eliminate the effect of location through sample design, using only banks in counties that were not part of any Metropolitan Statistical Area (MSA), that

had high ratios of agricultural loans to total loans, and that were in one of nine states with restricted branching in 1985. They found that agricultural loans comprised a significantly smaller share of assets for banks owned by bank holding companies than for other banks, and the holding company effect was greater, the larger the parent company.

Laderman, Schmidt, and Zimmerman (1991) looked at the effects of location on agricultural lending by banks. They found that banks headquartered in MSAs had significantly lower ratios of agricultural loans to total loans. The sample consisted of banks surveyed each quarter from 1981 through 1996 by the Federal Reserve as part of the Survey of Terms of Bank Lending to agriculture; this group of banks, varying in number from 168 to 188 depending on the date, has been deemed to be representative of farm lenders. The only bank-specific variables in their model were total assets and the ratio of deposits to loans; no measures of ownership structure were included, so it is not clear to what extent the results were driven by structural differences rather than location. They found that size had a negative but insignificant effect on farm lending.

Whalen (1995) covered small agricultural loans as part of a more general analysis of small-business lending by banks. Whalen's sample consisted of 1,377 banks in the states of Illinois, Kentucky, and Montana (all of which had restricted branching as of his June 1993 sample date). Whalen looked specifically at the effects of bank size, holding company ownership, and out-of-state ownership; he found some evidence that small banks not owned by bank holding companies have higher ratios of agricultural loans to total assets than do other banks. However, Whalen acknowledged that the difference might reflect location rather than structure, since he found no significant size-or affiliation-related differences in mean agricultural loan ratios among banks in non-SMA areas.

Rahji and Adeoti (2001) identified the determinants influencing commercial banks decision to ration agricultural credit in South-western, Nigeria. Data for the analysis were sourced from the agricultural credit transactions of the banks. Evidence, from the estimated logit model indicated that farm size of the farmers; previous year's income, enterprises type, household net worth and level of household agricultural commercialization are significant but negative factors influencing the bank's decision to ration credit. Higher values of these factors decreases the probability that the borrowers will be credited rationed. The number of dependents in the household has a positive significant impact on the probability of being credit constrained by the banks. Hence higher values of this variable increase the likelihood of being credit rationed. The results also indicate that the larger the magnitude of the coefficient estimated, the bigger is its impacts on the odds of being credit-ration per unit change in its variable. On the other hand, the larger the parameter, the lower the percentage changes in the odds per unit change in the variable. Based on the results obtained farmland redistribution, farm income improvement, gender specific and credit allocation policies to the crop sub-sector were recommended.

Cole (2008) integrated theories of political budget cycles with theories of tactical electoral redistribution to test for political capture in a novel way. Studying banks in India, he found that government-owned bank lending tracks the electoral cycle, with agricultural credit increasing by 5-10 percentage points in an election year. There is significant cross-sectional targeting, with large increases in districts in which the election is particularly close. This targeting does not occur in non-election years, or in private bank lending. He showed that capture is costly; elections affect loan repayment, and election year credit booms do not measurably affect agricultural output.

Langat (2012) examined the determinants of lending to farmers by commercial banks in Kenya. The study was conducted through a survey using structured questionnaires. The sample population was 43 licensed commercial banks in Kenya for the period 2012. He found out that standards adopted before lending has a great effect on the amount demanded and supplied.

Illo (2012) determined the effect of macroeconomic factors on financial performance of commercial banks in Kenya. The performance measure of banks used was the return on asset which was regressed against the macroeconomic variables including GDP growth rate, exchange rate, the money supply, inflation and lending rate of the sampled commercial bank. She found that the performance of commercial bank measured by return on asset was found to be positively correlated with GDP growth rate, money supply, lending rate of individual commercial banks, and inflation negatively correlated with exchange rate. The variables used in this study do affect agricultural in lending.

2.5 Summary of Literature Review

The literature review covered both theoretical review and empirical review on lending agriculture sector by commercial bank. The theoretical review include: Credit Market Clearing theory, Ewert et al (2000) postulates that if collateral and other pertinent restrictions remain given, then it is only the lending rate that determines the amount of credit that is dispensed by the banking sector. Signaling Argument Theory, Chodecai (2004),the borrowers who always have private information will be forced to reveal (signal) their better quality through pledging of collateral to show their better status as opposed to lower quality borrowers. Farm characteristic theory, Ewert, Schenk and zczensy (2000) "there are firm-specific agency problems that can be mitigated using collateral or such covenant and each firm chooses a financial contract that

maximizes firm value by trading off additional bonding and monitoring costs against reductions in interest rate premiums". All these theories have explained generally the lending behavior of commercial bank to all enterprises.

Empirical review examines the literature by other scholars on the lending to agriculture sector, specifically on lending decisions by bank. Gilbert and Belongia (1998) examined the effect of bank size and holding company affiliation on agricultural lending they found that agricultural loans comprised a significantly smaller share of assets for banks owned by bank holding companies than for other banks, and the holding company effect was greater the larger the parent company. Laderman, Schmidt, and Zimmerman (1991) looked at the effects of location on agricultural lending by banks. LSZ found that banks headquartered in MSAs had significantly lower ratios of agricultural loans to total loans. Locally, Langat (20120 examined the determinants of lending to farmers by banks. He found out that standards adopted before lending has a great effect on the amount demanded and supplied. From the literature review, it is evident that limited research has been done on lending to agricultural sector in Kenya specifically in relation to Incentive-Based risk management. Therefore, this study seeks to fill the gap by investigating the effect of IBRM on lending agriculture sector in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The main areas that were focused in this chapter are research design, population target of the study, data collection, data analysis, data validity and reliability, and test of significance.

3.2 Research Design

In this study a descriptive survey was used. Descriptive research portrays an accurate profile of persons, events, or situations (Robson, 2002). The study determined the effect of incentive-based risk management on lending to agricultural sector in Kenya.

3.3 Study Population.

"A population is an entire group of individuals, events or objects having common characteristics that conform to a given specification." (Mugenda & Mugenda, 2003).According to Saunders (2003) the population is the full set of cases from which a sample is taken. The total population was 43 licensed commercial banks in Kenya as at the end of December 2013(Appendix I)

3.4 Data Collection

Data collection is gathering empirical evidence in order to gain new insights about a situation and answer questions that prompt undertaking of the research (Flick, 1998). Primary data is the type of data collected. The dependent variable was lending agricultural sector by bank measured by likert scale. The independent variables collected are: Incentive-based risk management system measured by likert scale; size of the bank measured by likert scale; and the market measured by

likert scale. The data was collected from the 43 commercial banks in Kenya. The questionnaires were self administered (Appendix II: Sample questionnaires). To address the objective of the study, Likert scale and ordinal scale was used. The data collection procedures included: delivering the questionnaires to targeted respondents; provide the respondents adequate time to complete the questionnaires accurately; collecting of questionnaires, checking the completeness and clarifying unclear responses.

3.4.1 Data Validity and Reliability.

Validity is concerned with whether the findings are really about what they appear to be about while reliability refers to the extent to which the data collection techniques or analysis yield consistent findings. In order to establish the validity, the instrument SPSS was used to determine the coefficient of determination that indicate the extent to which the independent variables explain the changes in the dependent variable. The ANOVA model was also established to indicate the level of fitness and validity of the model with the existing set of independent variables.

3.5 Data Analysis.

The whole process which starts immediately after data collection and ends at the point of interpretation and processing data is data analysis (Cooper & Schindler, 2003). Therefore, editing, coding, classifying and tabulating will be the processing steps that were used to process the data that was collected for a better and efficient analysis. Data analysis involved: First data preparation, which involved data validation, checking the data for accuracy, entering the data

into the computer. Secondly, descriptive statistics was used to describe the basic features of the data in the study. It provides simple summaries about the sample and measures.

3.5.1 Analytical Model

For empirical work, Y was independent variable, modeled as linear function. Dependent variables will be incentive-based risk management; bank size; and the market. The variables were factored in the multivariate regression model.

$$Y = \propto + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon$$

Where

Y : Lending Agricultural sector by bank measured by Likert scale.

$\propto$: A constant.

ε: Error Term.

x_1 Incentive-based risk management measured by Likert scale.

x_2 : Size of the bank, measured by Likert scale.

x_3:Bank's market, measured by Likert scale.

The variables$x_1 \ x_2 \ x_3$ are explanatory variables which influence lending to agriculture sector, Y, and the coefficient estimates $\beta_1, \beta_2, \beta_3$, measure the impact of each variable on the optimal quantity of agricultural loans in the bank's portfolio, conditional on the bank engaging in such lending.

The Statistical Package for Social Sciences (SPSS) version 20 was used to analyze the data. while the use of descriptive statistics determined frequencies and percentages. The results were presented in pros and tubular.

3.6 **Test of Significant**

The researcher used F-test to test the hypotheses. This is because the study involves many coefficients. Under F-test, the researcher estimates two regressions referred to as restricted and unrestricted regressions. In the unrestricted regression, the coefficients are freely determined by the data. In the unrestricted regression, the values of some of the coefficients are restricted. The test-statistic follows the F-distribution. Under the Null hypothesis. The F-distribution has two degrees of freedom parameters: M in the numerator and T-K in the denominator. In performing the hypothesis test, the researcher, compared the test-statistic with the critical value from the F-distribution Table. The Null hypothesis is rejected if the test-statistic exceeds the critical value, otherwise it is not rejected.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND INTERPRETATIONS

4.1 Introduction

This chapter presents analysis and interpretations of the data from the field. It presents analysis and findings of the study as set out in the research methodology on the effect of incentive-based risk management on lending to agricultural sector in Kenya. The data was exclusively obtained using closed-ended questionnaire from the commercial banks and the central bank of Kenya. The data obtained was fed into SPSS version 20.0 and which was used to measure effect of IBRM on lending to agricultural sector in Kenya. This chapter sets off with descriptive statistics, then tests of IBRm. In addition to descriptive analysis, regression analysis and were conducted. The discussions of these findings are:

4.2 Findings

4.2.1 Incentive-Based Risk Management

The researcher requested the respondent to indicate the extent that the IBRM affects expansion of lending to agricultural sector in Kenya. According to the findings 59% indicated that IBRM affects lending to a very great extent, 38.5% said to a great extent and 2.6% said moderately. This is shown in the frequency Table 4.1

Table 4.1: Frequency of Incentive-Based Risk Management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderate	1	2.6	2.6	2.6
	Great extent	15	38.5	38.5	41.0
	Very great extent	23	59.0	59.0	100.0
	Total	39	100.0	100.0	

Source: Research Finding

To establish the relationship between the IBRM and lending to agricultural sector, a descriptive analysis was done. The study collected data using questionnaire: "To what extend the IBRM expand lending to agricultural sector". De-risking agricultural finance value chain had a average score of 4.3077, building Long term capacity 4.2564 and bank incentive for agricultural value chain 4.2821 while the standard deviation was 0.65510, 0.63734, 0.55954 respectively. The results were as shown in the Table.4.2.

Table 4.2 Descriptive Statistics for IBRM

	N	Minimum	Maximum	Mean	Std. Deviation
De-risk agr. finance value chain	39	3.00	5.00	4.3077	.65510
Build capacity	39	3.00	5.00	4.2564	.63734
Bank Incentives	39	3.00	5.00	4.2821	.55954
Valid N (list wise)	39				

Source: Research Finding

4.2.2 Bank's Market

The researcher also requested the respondent to indicate the extent that the bank's market influence lending to agricultural sector in Kenya. According to the findings 61.5% indicated that bank's market influenced lending to a very great extent, 25.6% said to a great extent and 12.8% said moderately. This is shown in the frequency Table 4.3.

Table 4.3 Frequency of Bank's Market

		Frequency	Percent	Valid Percent	Cumulative Percent
	Moderate	5	12.8	12.8	12.8
	Great extent	10	25.6	25.6	38.5
Valid	Very great extent	24	61.5	61.5	100.0
	Total	39	100.0	100.0	

Source: Research Finding

To establish the relationship between the market and lending to agricultural sector, a descriptive analysis was done. The study collected data using questionnaire: "To what extend the market influenced lending decision to agricultural sector." Market value of agricultural sales had a mean score of 4.2051, bank branch locations 4.2564 and bank deposits 4.2564, while the standard deviation was 0.73196, 0.67738, 0.71517 respectively. The results were as shown in the table.4.4.

Table 4.4: Descriptive Statistics for Bank's Market

	N	Minimum	Maximum	Mean	Std. Deviation
Agr, sales	39	3.00	5.00	4.2051	.73196
Branch locations	39	3.00	5.00	4.2564	.67738
bank deposits	39	3.00	5.00	4.2564	.71517
Valid N (listwise)	39				

Source: Research Finding

4.2.3 Bank's Size

The researcher requested the respondent to indicate the extent that the bank's size influence lending to agricultural sector in Kenya. According to the findings 43% indicated that bank's size influence lending to a great extent, 41% said to a very great extent and 15.4% said it influence moderately. This is shown in the frequency Table 4.5

Table 4.5: Frequency Bank's Size.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderate	6	15.4	15.4	15.4
	Great extent	17	43.6	43.6	59.0
	Very great extent	16	41.0	41.0	100.0
	Total	39	100.0	100.0	

Source: Research Finding

To establish the relationship between the size of the bank and lending to agricultural sector, a descriptive analysis was done. The study collected data using questionnaire: "To what extend the size influenced lending decisions to agricultural sector." Bank's size had a mean score of 4.2564 and a standard deviation was 0.71517. The results were as shown in the table.4.6.

Table 4.6: Descriptive Statistics for Bank's Size

	N	Minimum	Maximum	Mean	Std. Deviation
Bank's size	39	3.00	5.00	4.2564	.71517
Valid N (list wise)	39				

Source: Research Finding

4.2.4 Data Validity and Reliability

Validity is concerned with whether the findings are really about what they appear to be about while reliability refers to the extent to which the data collection techniques or analysis yield consistent findings. The ANOVA model was also established to indicate the level of fitness and validity of the model with the existing set of independent variables as shown in the Table 4.7

Table 4.7 ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		29.244	38	.770		
	Between Items	4.327	3	1.442	5.588	.001
Within People	Residual	29.423	114	.258		
	Total	33.750	117	.288		
Total		62.994	155	.406		

Grand Mean = 4.5064

Source: Research Finding

The F-value is 5.588 and the corresponding p-values is given as <0.001. Therefore, the null hypothesis is rejected and concludes that the average independent variables are not the same.

4.2.5 Coefficient of Determination on Lending to Agricultural Sector

The coefficient of determination is a measure of how well a statistical model is likely to predict future outcome. The coefficient of determination r^2 is the square root of the sample correlation coefficient between outcome and predicted values. As such it explains the extent to which change in the dependent variable (Lending to agricultural sector) can be explained by the change in the independent variable (IBRM, Market and size). This is shown in the Table 4.8.

Table 4.8: Coefficient of Determination on Lending to Agricultural Sector

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.776[a]	.603	.569	.29941

a. Predictors: (Constant), Bank's size, Incentive based risk mgt, Bank's market

Source: Research Finding

The three independent variables that were studied, explains only 60.3 % of the lending to agricultural sector as represented by R^2. This shows that 60.3% of the variables studied (IBRM, bank's Market and bank's Size) affect agricultural lending, while other factors not studied in this research influence agricultural lending decisions in Kenya by 39.7%.

4.2.6 Multiple Regression Analysis on Lending to agricultural sector

The researcher conducted a multiple regression analysis so as to establish the effect of IBRM on lending to agricultural sector in Kenya. Multiple regressions is a statistical technique that allows us to predict a score of one variable on the basis of their scores on several other variables

Table 4.9 Multiple Regression Analysis on Lending to agricultural sector

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.480	.478		3.094	.004
	Incentive based risk mgt	.564	.094	.683	6.001	.002
	Bank's market	.107	.075	.170	1.432	.161
	Bank's size	.043	.072	.067	.598	.553

a. Dependent Variable: Lending To Agriculture Sector.

Source: Research Finding

The researcher conducted a multiple regression analysis so as to determine the relationship between lending to agriculture sector in Kenya and the three independent variables. The regression equation ($Y = \propto + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon$) now becomes:

$$Y = 1.480 + 0.564x_1 + 0.107x_2 + 0.043x_3$$

$$(.478) \quad (.094) \quad \quad (.075) \quad \quad (.072)$$

Where:

$x_1 = Incentive - based\ risk\ management$

x_2 = Bank's market.

x_3 = Bank's Size.

Estimated coefficients for each variable are presented in Table 4.9 .Standard errors are in parentheses immediately below each coefficient in the regression equation.

4.2.7 Interpretation of the Findings

According to the regression equation established, taking all factors (IBRM, bank's market, Bank's size) at 99% confidence interval at a constant zero, lending to agriculture sector in Kenya would stand at 1.480.

The Variable that measure the degree to which IBRM expands lending, IBRM, has a positive and strongly significant effect. A unit increase in IBRM would lead to expansion of lending to agriculture sector in Kenya by a factor of 0.564.

The variable that measures the degree to which bank's market are agricultural, market, has a positive and significant effect. A unit increase in bank's market would lead to expansion of lending to agriculture sector in Kenya by a factor of 0.107. The larger a bank's presence in highly agricultural areas according to this measure, the more likely that the bank does at least some farm lending. This result directly supports the hypothesis that a bank's decision to engage in a particular type of lending reflects the composition of its local market.

The significant positive coefficient on bank's size shows that larger banks are likely to engage in agricultural lending. A unit increase in bank's size would lead to expansion of lending to agriculture sector in Kenya by a factor of 0.043. However, the significance level of bank's size is not big enough. This results show that the larger banks are less likely to engage in agricultural lending than are smaller banks.

IBRM has the highest coefficient value of 0.564. The implication of this is that this explanatory variable has the highest impact and influence on lending behavior of commercial banks and a change in it will yield the highest change in lending to agriculture sector in Kenya. The study therefore, recommends that banks and the government should strive to maintain IBRM

approaches efficiently so that their objectives of banks' profitability and farmers' benefits are achieved and multipliers effects maintained to the maximum.

The study deduced that IBRM affects lending to a very great extent. The principle components that affect the lending to agriculture sector in Kenya include: de-risking agricultural finance value chains, building long term capacity and institutionalising incentives for agricultural value chains. This result directly supports the model by Swinnen, Vandeplas & Maertens (2010) that IBRM is an approach that integrates a set of factors that are essential for expanding agricultural lending so that the risks and capacity bottlenecks along the agricultural and financial value chains are simultaneously addressed. It is demand driven and uses customized risk-sharing instruments to allow banks and other financial actors to select the parts of the value chains they are most interested in for lending.

The three expressed explanatory variables (IBRM, bank's market and bank's size) were discovered to have significant influence on the lending behaviour of banks to agricultural sector in Kenya. All the variables are positively correlated with bank lending. This implies that the explanatory variables tend to move in the same direction with bank's lending to agriculture sector in Kenya.

To establish the relationship between the IBRM and lending to agricultural sector, a descriptive analysis was done. De-risking agricultural finance value chain had a average score of 4.3077, building Long term capacity 4.2564 and bank incentive for agricultural value chain 4.2821 while the standard deviation was 0.65510, 0.63734, 0.55954 respectively. All the three principle of IBRM has the lowest risk which has positive effect on expansion of lending to agriculture sector in Kenya. ."

The relationship between the bank's market and lending to agricultural sector is positive Market value of agricultural sales had a mean score of 4.2051, bank branch locations 4.2564 and bank deposits 4.2564, while the standard deviation was 0.73196, 0.67738, and 0.71517 respectively. While the relationship between the banks' size and lending to agricultural sector is positive. Bank's size had a mean score of 4.2564 and a standard deviation was 0.71517.

To examine the validity and reliability of the model used, the researcher used F-test to test the hypotheses. This is because the study involves many coefficients. Under F-test, the researcher estimates two regressions referred to as restricted and unrestricted regressions. In the unrestricted regression, the coefficients are freely determined by the data. In the unrestricted regression, the values of some of the coefficients are restricted. The test-statistic follows the F-distribution. Under the Null hypothesis, the F-distribution has two degrees of freedom parameters: M in the numerator and T-K in the denominator. In performing the hypothesis test, the researcher, compared the test-statistic with the critical value from the F-distribution Table. The Null hypothesis is rejected if the test-statistic exceeds the critical value, otherwise it is not rejected. The F-statistics was 5.5588 and the critical value was 4.51 at 1% significance level. Since F-statistics is greater than F-tabulated value, the null hypothesis is rejected, which shows that the parameter estimates are significant at all the levels.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENTATIONS

5.1 Summary

The study was intended to investigate the effect of IBRM on lending to agriculture sector in Kenya. In order to achieve this objective, the study was designed to collect and analyse the relevant data of the 43 commercial banks in Kenya. The study sought to determine the effect of IBRM on lending to agricultural sector in Kenya. According to the findings, majority of the respondents reported that the IBRM expands lending to agriculture sector in Kenya to a very great extent. The IBRM approaches include: de-risking agricultural finance value chain, building long term capacity and institutionalizing incentives for agricultural value chains.

The study further revealed that bank's market influenced lending decisions to agriculture sector to a great extent, followed by bank's size.

5.2 Conclusion

The study observed a relationship between lending to agriculture sector in Kenya and Incentive-based risk management. IBRm is found to support much higher volumes of bank lending behavior to agriculture sector in Kenya. It restores confidence and determines the elasticity of the system to shocks as well as enhancing the credibility of the financial institutions in Kenya.

Financial services providers, including commercial banks in Kenya, generally view financing smallholder farmers as a high risk investment. Few banks accept farmers' assets as collateral, and those that are willing to provide smallholder with loans charge very high interest rates, making it both difficult and appealing for farmers to invest in upgrading their operations. The study findings reveals that IBRM, when efficiently established, addresses the challenges of availing affordable credit to smallholder farmers and small-to-medium-sized agribusinesses across Kenya.

The study further concludes that, both the government and banks should be mindful of the fact that the environments in which they operate are important factors in the bank performance and behavior. It is also clear that, where the environment is conducive and supportive, performance is enhanced and good lending behavior guaranteed. But where the environment is unstable and harsh, the bank's performance suffers.

5.3 Recommendations for Policy

From the results obtained it is clear that incentive-based risk management approaches plays a significant role in the credit provision in Kenya. Based on the findings on this study, the following recommendations are made:

Develop relevant policies and establish enabling environments conducive for productive investments by both commercial banks and the agricultural sector to boost the productivity and performance of agriculture sector players, especially small-scale farmers.

Develop pro-poor, smallholder-centered investment models for agriculture financing that provide incentives for all players along the value chain, including financiers, smallholder farmers, and agroprocessors.

The government should play a vital role by establishing a conducive environment characterized by favorable macroeconomic policies, adequate infrastructure, a strong human capital base, competent government administration, and political stability. This will mobilize effectively the creativity, drive, and resources of the private sector.

5.4 Limitation of the Study

The study was not without limitations. Secondary data was collected from the central bank of Kenya. The study was also limited to the degree of precision of the data obtained from the secondary sources, while the data was verifiable, it nonetheless could still be prone to these shortcoming.

The study faced the challenges in terms of financing the research and also the available time frame to fully conclude the data collection and make the best conclusion.

5.5 Suggestion for Further Research

The study investigated the effect of incentive-based risk management on lending to agriculture sector in Kenya. The study recommends that further research should be done on the very same topic but this time round concentrates on loans financing permanent assets of agricultural sector in Kenya.

Further studies should be done on the effect of agricultural market on the influencing lending to the agriculture sector in Kenya to account for the 39.7% not contributed by the study.

A further research should be done on the impact of gender on commercialization of agriculture in Kenya.

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APPENDICES

Appendix I: List of Commercial Banks in Kenyas at 31st December 2013

1. African Banking Corporation Ltd.
2. Bank of Africa Kenya Ltd.
3. Bank of Baroda (K) Ltd.
4. Bank of India
5. Barclays Bank of Kenya Ltd.
6. CFC Stanbic Bank Ltd.
7. Charterhouse Bank Ltd
8. Chase Bank (K) Ltd.
9. Citibank N.A Kenya
10. Commercial Bank of Africa Ltd.
11. Consolidated Bank of Kenya Ltd
12. Co-operative Bank of Kenya Ltd.
13. Credit Bank Ltd.
14. Development Bank of Kenya Ltd.
15. Diamond Trust Bank Kenya Ltd.
16. Dubai Bank Kenya Ltd.
17. Ecobank Kenya Ltd
18. Equatorial Commercial Bank Ltd.
19. Equity Bank Ltd.
20. Family Bank Limited
21. Fidelity Commercial Bank Ltd
22. GT Bank Ltd
23. First community Bank Limited
24. Giro Commercial Bank Ltd.
25. Guardian Bank Ltd

26. Gulf African Bank Limited
27. Habib Bank A.G Zurich
28. Habib Bank Ltd.
29. Imperial Bank Ltd
30. I & M Bank Ltd
31. Jamii Bora Bank Limited.
32. Kenya Commercial Bank Ltd
33. K-Rep Bank Ltd
34. Middle East Bank (K) Ltd
35. National Bank of Kenya Ltd
36. NIC Bank Ltd
37. Oriental Commercial Bank Ltd
38. Paramount Universal Bank Ltd
39. Prime Bank Ltd
40. Standard Chartered Bank Kenya Ltd
41. Trans-National Bank Ltd
42. UBA Kenya Bank Limited
43. Victoria Commercial Bank Lt

Source: CBK (2013).

Appendix II: Questionnaire

A) Expansion of Lending to Agricultural Sector

1. Please indicate to what extent you agree that incentive-based risk management approach (IBRM), [IBRM is an integrated package of de-risking solutions comprising risk sharing instruments, insurance facility, technical assistance, and a bank incentive that aims at transforming public capital into productive capital-capital that is used to realign incentives for private sector investments to the agriculture sector.], expand lending to agriculture sector in Kenya, using a scale of 1-5 below, (mark with an x), in which:

   5 = Very Great Extent [   ]   4 = Great Extent [   ]   3 = Moderate [   ]

   2= Small Extent [   ]   1 = very Small extent [   ]

2. To what extent have the following incentive-based risk management principles influenced expansion of lending by your bank to agricultural sector, using a scale of 1-5, (mark with an x), in which:

   5 = Very Great Extent [   ]   4 = Great Extent [   ]   3 = Moderate [   ]

   2= Small Extent [   ]   1 = very Small extent [   ]

Incentive-Based Risk Management Principles	Extent				
	5= Very Great Extent	4= Great Extent	3= Moderate	2 = Small Extent	1 = Very Small Extent
De-risking agricultural finance value chain sharing. [Involves establishing risk sharing and insurance facilities]					
Building long term capacity [Providing technical assistance facilities e.g. expand financial inclusion, building capacity of agricultural value chains, and building capacity of bank]					
Institutionalize incentives for agricultural lending [Involves establishing agricultural bank rating scheme and bank incentive mechanism]					

B) Bank's Market

3. Please indicate to what extent does the bank's market influenced lending decisions to agricultural sector in Kenya in your bank, using a scale of 1-5, (mark with an x), in which:

5 = Very Great Extent [   ]   4 = Great Extent [   ]   3 = Moderate [   ]

2= Small Extent [   ]   1 = very Small extent [   ]

4. To what extent have the bank's market determinants   influenced lending decisions to agricultural sector in your bank, using a scale of 1-5, (mark with an x), in which:

5 = Very Great Extent [   ]   4 = Great Extent [   ]   3 = Moderate [   ]

2= Small Extent [   ]   1 = very Small extent [   ]

Bank's Market Determinants	Extent				
	5= Very Great Extent	4= Great Extent	3= Moderate	2 = Small Extent	1 = Very Small Extent
Market value of agricultural sales					
Locations of branches of banks					
Deposits at each branch of the bank					

C) Bank's Size

5. To what extent have the bank's size influenced lending decisions to agricultural sector in your bank, using a scale of 1-5, (mark with an x), in which:

5 = Very Great Extent [   ]   4 = Great Extent [   ]   3 = Moderate [   ]

2= Small Extent [   ]   1 = very Small extent [   ]

THANK YOU

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