CHAPTER ONE

INTRODUCTION

1.1   Statement of the Problem

The Nigerian banks have experienced rapid growth in size and capacity over the past five decades. The industry grew from 8 banks with a total of 160 branches on October 1, 1960, to 24 banks with 5639 branches across the country as at the end of 2013 (see table A-8 in the appendix). In terms of deposit mobilizations and credit creation, the industry has also witnessed remarkable growth. The aggregate deposit liabilities of the commercial banks rose from ₦978.6 million at the end of December 1960 to ₦1324.5 million and ₦2716.5 in 1965 and 1970 respectively. The figures represent 35.4 and 105.1 percent growths respectively for the two 5-year intervals in the decade (see table A-3 in the appendix). In terms of loans and advances, the banks' total loan and advances rose in real terms from N813.6 million in 1960 to N1350 million and N1528.3 million over the same period. The increases represented 65.9 and 13.2 per cent growth for the two periods. The growths in the first post independence decade was triggered by rapid expansion in loans and economic activities which went into the financing of increased consumption expenditure arising from the new political independence achieved in 1960 (Oyejide and Soyode, 1986).

The rapid growths continued in the subsequent decades. The banking sector deposit grew averagely by 48.96, 458.51, -1.55, -22.97 and 285.9 percents between 1960-70, 1970-80, 1980-90, 1990-2000 and 2000-10 respectively. The growth in the average loans and advances over time also increased enormously. The average aggregate real loans and advances rose by 38.46, 284.81, 61.9, -30.7 and 353.4 in the intervals between 1960-70, 1970-80, 1980-90, 1990-2000 and 2000-10 respectively. For the five decades 1960-70, 1970-80, 1980-90, 1990-2000 and 2000-10, the deposit liabilities increased averagely in real terms by N1457.7 million, N8141.3 million, N8015.4 million, N6173.9 million, and

N23828 for the periods respectively. This compares with the average increase in the size of loans and advances over the same periods which were by N1126.5 million, N4334.5 million, N7018.4 million, N4861.8 million, and N22043.1 for the periods respectively.

In terms of sectoral composition of credits, the banking system loans and advances to the various sectors of the economy have deepened substantially. The aggregate loans and advances in the first decade which were mainly concentrated in the financing of domestic trade, miscellaneous economic activities and discounting of bill of exchange in the 1960s deepened to involve other sectors of the economy, such that by the end of 2010, all sectors of the economy shared in the distribution of the commercial banks' loan and advances. But despite the impressive growths in loans and advances, the banking system was still being faced by the poor performances in their loan activities. In the wake of the recent global economic meltdown, the size of loan defaults, bad debts and provisions for non-performing[1] loan climbed to very disturbing levels. The size of non-performing loan as percentage of total credit rose from 22 percent in 2003 to 32.9 percent and 29.6 per cent in 2009 and 2010 respectively (see table 2.4). Despite the stringent interventions of Lamido Sanusi as the governor of the central bank which lowered the ratio from 2011, there is concerned that rising NPLs could reverse the gains made in the asset quality of the banking industry and needs to be watched. For instance, between 2012 and 2013, the volume of Non-Performing Loans (NPLs) in the Nigerian banking sector increased by N38.05 billion (approximately 13.30 percent) to N324.14 billion in 2013 from N286.09 billion as at December 2012. Most loan defaults can be traced to wrong lending decisions which were made out of asymmetric information. The occurrences of loan defaults have underlined Nigeria's bank crises over the past five decades.

Because of its dominance in the financial market, the banks serve as the major source of loan facility. As a consequence, the demand for its loans facility remains very high and costly. Loan experiences among the commercial banks have been characterised by high incidence of defaults (Andrianova, Baltagi, Demetriades and Fielding 2011, Demetriades and Fielding 2010). These occurrences of defaults amidst competing borrowers suggest

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[1] Including bad and doubtful loans

that the financial institutions are either faced with imperfect information about the characteristics of their borrowers during lending transactions, or that the commercial banks screening criteria are inefficient in foreclosing default incentives. Banks face information asymmetry when considering the loan applications of their borrowers because they tend to have more and better information about their characteristics and the suitability of projects presented for funding. Information asymmetry inhibits banks from accurately predicting the quality of borrowers and the suitability of projects during funding considerations. The asymmetry arises because borrowers tend to have private information about their competence and the prospects of investments they present to the banks for funding. For most of the occurrence of information asymmetry, it is usually the case that such information is virtually unavailable to one of the economic agent, and where available, it may be uneconomic to obtain or difficult to interpret to the informationally deprived person. In most of the bank lending situations, information advantage usually reside with the borrowers and exposes the banks to adverse selection and/or moral hazard risks (Deakins, 1999). The adverse selection risk arises because lending to borrowers may subsequently fail, and banks may not be able to monitor the borrowers once loans have been made to ensure that they act in their own best interest. This study examines the existence of information asymmetry in the banking sector with respect to how it affects the efficiency of loans made by the banks. In view of the fact that the occurrence of information asymmetry leads to market failure, attempt was made to characterize the nature of equilibrium that will persist in the market.

1.2   Objectives of the Study

The general objective of this study is to examine the existence of information asymmetry and its consequences in the lending relationship of banks and their borrowers in Nigeria. In specific terms, the study strives to:

 i.   test for the presence of adverse selection and/or moral hazard;

 ii.   examine how information asymmetry affects loan default; and

iii.   determine the nature of equilibrium in the loan market

1.3 Justification for the Study

Information asymmetry is known to generate inefficiency in financial markets (Stiglitz and Weiss, 1981). As evidenced by high occurrence of loan defaults, distress, credit risks and financial market disequilibrium (Andrianova, Baltagi, Demetriades, 2011), Nigeria ranks high among countries with leading occurrences of information asymmetry in Africa. Compared to other regions of the world, the Sub-Sahara region has been largely financially under-developed (Honohan and Beck, 2007). The established evidence from recent studies shows that commercial banks in the region are deterred from increasing their lending because of the high rate of loan defaults and the presence of imperfect information (Demetriades and Fielding, 2010; Andrianova, Baltagi, Demetriades and Fielding, 2011). The problem of information asymmetry causes banks to emphasize on the availability of collaterals and other screening criteria rather than on evaluating the viability of the proposed investments put forward for lending consideration as a means of ensuring that their loans are safe. On the side of the borrowers, the success of loans is dependent on the ability to commit adequate effort to realize their investment rather than the banks' reliance on collateral requirement as a means of foreclosing default. Reliance on collateralization suggests that where collaterals are not available, funds mobilized by the banks will not be intermediated or borrowers would be credit rationed (Stiglitz and Weiss, 1981).

The impact of information asymmetry in bank lending relationship is to weaken the chances of repayment on loans despite the reliance by banks on collateral requirement. Information asymmetry problem causes the size of loans demanded by borrowers to correlate with their default risk characteristics. In view of this, those who take up larger loans will then be the high risk borrowers and smaller loan by the low risks. Given the prevalence of this phenomenon in Nigerian bank lending relationship, existing studies have been focused on the impacts of information asymmetry in stock price predictions and capital market performance (Osamwonyi, 2003; Okpara, 2010; Abosede and Oseni, 2011, and Nosa et al, 2012), such that the gaps between the predictions and actual stoch porices are used to reflect the size (and extent) of the asymmetry. In the studies, the existence of information asymmetry is used to reflect the gap between information available to the

managers and that actually accessible to the shareholders. Studies on the impact of information asymmetry on the efficiency of bank lending have remained lacking. This study looks at information asymmetry in the banking industry, by considering its skewed existence between banks and their borrowers both in terms of possession and disclosure in the course of lending. In view of the link between information lop-sidedness and the performance of loans in the banking system, this study, therefore, examines the existence of information asymmetry on the efficiency of bank loans in Nigeria. Based on the theoretical explanation of lending relationship by Boot (2000), a durable bank-borrower lending relationship provides avenue to resolve market failure problems. In particular, continuing relationship is associated with lower loan rates, less stringent collateral requirements, and lower likelihoods of credit rationing (Berlin and Mester, 1999). The study considered the role of collateral requirement and other screening measures in assuaging market failure problems arising from information asymmetry. The study supports the dominant perspective in the literature which viewed information asymmetry as originating mainly from the borrowers[2] (Bebczuk, 2003). Using a game theoretic framework, the study joins in the debate ignited by Sharpe (1990), Fischer (1990) and von-Thadden (2001) on the nature of the equilibrium occurring during bank-borrower lending relationship, and argues that bank-borrower lending relationship game has pure strategy equilibrium in the short-run.

1.4   The Scope of the Study

This study is centred on how unequal possession of information between borrowers and their lending banks affect the relationship that exists in the course of lending. Lending is one of the core functions of commercial banks, and is affected by the prevailing macroeconomic environment of the time. The primary data used was collected via a structured questionnaire across 210 sampled borrowers from 15 banks in 12 states of the Federation. The States were chosen based on banks' concentration and accessibility of the target group. The loans considered were mainly investment loans and the focus of the

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[2] Based on the theory, the borrowers are seen as being less sophisticated compared to the bank in terms of the capacity to detect asymmetry. Where they are able to detect that they are cheated, they respond to it by choosing to default.

study was on the demand side of the market. Loans considered spanned between 2000 and 2013.

In this study, banks are treated as the source of all loans, and as a result, lenders and bank are used interchangeably, while low risk, safe and good/high quality borrowers were used to mean the same thing. Information asymmetry is used to encompass imperfect, partial and/or incomplete information disclosure. The words were used interchangeably in many times to refer to the same thing. Since part of the precondition for bank loans is the operation of an account, being a customer were also used in some instances to imply having borrowed or being a borrower. The focus of the study is on the deposit money banks. This group of banks have remained dominant in the financial sector.

While factors such as poor corporate governance, borrowers' collusion, executive and insiders' criminality have become rising causes of loan defaults and systemic failures in recent time, the whole of all these factors are regarded as deriving from the existence of information asymmetry. The study focused mainly on information asymmetry that are related to contractual lending relationship but do not extend to other forms of information asymmetries as exists in the stock exchange market and markets for other financial assets. In furtherance, it precludes the type of asymmetry occurring between the bank holders and the shareholders, the bank managers and the regulators; and between the managers and the depositors. The presence of information asymmetry is assumed as the source of loan failures, and could result even when loans are collateralized. The use of game theory was for the sake of characterizing the nature of equilibrium between banks and their borrowers in the sharing of profits from the loans that actually succeeded. The usage does not supplant, but supplement the result from the use of Chiappori-Salanie test statistics (W) and probit models.

1.5   Organization of the Study

The thesis consists of seven chapters, arranged in sections as follows. Section one contains the introduction. Section two provides the background of the study. In the chapter, the evolution, structural changes, economic environments and changes in the risk

characteristics, inefficiencies in the financial system, link between causes of loan defaults and information asymmetry were discussed. The chapter provides a background to the study by reviewing the periodic changes in the structure of banks' loans and advances to the various sectors of the economy since the political independence in 1960.

In section three, the theoretical, methodological and empirical literature on information asymmetry was discussed. The crux of the discussion focused on the use of contract and game theory analogies to explain the impacts of information asymmetry in a bilateral lending situation.

Section four presents the theoretical framework of the study. Two frameworks are described in the section. The first framework is based on Chiappori and Salanie (2000) Statistics, and the second is a game theoretic approach. The Chiappori-Salanie Statistics gives the conditional situation with which information asymmetry can be said to exist. The statistics measures the magnitude of occurrence of information asymmetry. The game theory specifies the condition within which equilibrium exists in the market.

Section five contains the methodology. It used correlation methodology and statistics based on Chiappori and Salanie (2000) to validate the existence of information asymmetry. The chapter also employed the used of probit regressions to estimate the impact of the default variables in instigating asymmetric risks. Interpretations were given in terms of the coefficients, probabilities and the signs of the estimated parameters.

In Section six, the data, results and findings were presented. The results and findings were based on a survey of 210 borrowers obtained from 15 banks in 12 states of Nigeria. Section seven contains the summary and the conclusions.

CHAPTER TWO

BACKGROUND TO THE STUDY

2.1   Introduction

This chapter provides a background to the study by way of discussing the role of the commercial banks in the process of financial intermediation. It examined the evolution of the banks, the structural changes that have taken place in the industry in relation to the changes in the economic environment. In the discussions, developments in the banking industry were linked to changes in the consumers' risk characteristics and behaviours. The existence of information asymmetry was defined in relation to the occurrence of loan defaults, non-performing loans and frauds. The other sections of the chapter is organised as follows. Section 2.2 deals with the historical development of the commercial banks in Nigeria. The structural change and evolutions of reforms were discussed in sections 2.3 and 2.4 respectively. Sections 2.5 and 2.6 highlight the economic environment of banking relationships and behaviours and incidences of frauds. Discussions on the nature of asymmetries, loan defaults, loan screening and interest regimes form sections 2.7-10.

2.2   Historical Developments of Banks in Nigeria

The historical development of banks in Nigeria was motivated primarily by nationalist struggle against political colonialism and the quests for economic power through investment in financial market. Prior to the attainment of independence in 1960, the banking industry was dominated by the foreign expatriates, who used the opportunity to advance their colonial and capitalist interests. As a result, the Bank of British West Africa (later called Standard Bank, and now First Bank of Nigeria Plc) was established in 1892 by the European expatriate as the first bank in Nigeria. Indeed, as the West African Currency Board was formed in 1912, the Bank of British West Africa was then the sole importer of currency from the British Treasury. But with dissatisfaction in the operations of the bank, there was quest for establishment of indigenous commercial banks in Nigeria. The African merchants and elites took upon them the task of establishing indigenous banks to satisfy and expand their local financial needs as part of the colonial struggle. In effect, the first

indigenous bank was established in 1933, the National Bank of Nigeria Limited. It took however 14 years later before another Indigenous bank; the African Continental bank was established in 1947. Afterwards, the country witnessed the registration of many new banks. In effect, between February, 1951 and May 1952 (15 months), 18 banks were registered in Nigeria (Oyejide and Soyode, 1986). The rush for registration was due to the uncertainty of government intentions given that past government stances had barred such development. In addition, the opportunity for the registration was created because of the voting right by Africans which had just been allowed by the then 1951 constitution.

The supposedly banking boom of 1951-52 became aborted as a new banking Ordinance in 1952 was made, requiring the new banks to have paid up capital and reserves of £12500 and gave the previously existing banks 3 years within which to comply. Of the few indigenous banks which met the stipulated conditions, nearly all collapsed by the end of 1954. The 3 of the banks which survived, namely: the African Continental Bank, the Agbonmagbe Bank and the National Bank of Nigeria did primarily because the Eastern and Western Regional Governments in existence then injected public funds into the banks which enabled them to meet the capital requirement as contained in the 1952 banking ordinance. With the 1952 Banking Act, the capital requirement became raised to £300,000 and £750000 for indigenous banks and banks that were directly (or indirectly) controlled from abroad respectively (Nwankwo, 1986). Three leading banks, the First Bank of Nigeria Plc, Union Bank of Nigeria Plc (UBN) and United Bank for Africa Plc (UBA) had their origin from this period. While Barclays Bank (DCO) transformed to the Union Bank, The British and French bank was the precursor for UBA, while the Bank of British West Africa (later called Standard Bank) became the First Bank.

Despite the establishment of the indigenous banks, commercial banking in Nigeria was dominated by expatriate banks through the 1950s and into the 1960s. As at the time of the establishment of the Central Bank in 1959, despite the fact that 5 out of the existing 8 commercial banks were indigenous, the overbearing influence of the expatriate banks on the economy was still very impactful. By the end of 1971, the number of commercial banks increased to 14; the expatriates' banks rose to 6, while the indigenous banks became

8 with the branch networks increasing from 160 at the beginning of 1960 to over 300 branches. As at the time, the expatriate banks accounted for two-thirds of the total branch offices and controlled over 75 per cent of all loans and advances and 80 per cent of deposits. In view of this dominance, the expatriate banks were accused of maintaining low branch density relative to the population; maintaining very little contacts with Nigerians, who primarily provides the bulk of their deposits, and of being extremely conservative and discriminating against the indigenous population in their lending policy.

By the end of 1979, the number of commercial banks had increased to 20. The rapid growth in the number of the banks and their branches was driven mainly by an economy-wide boom resulting from increase in the revenues inflows from crude oil sales which necessitated increased economic activities and funding through the 1970s as the dominance of oil in the GDP became more pronounced. The upsurge in oil activities expanded the activities of the financial markets, and attracted new players into the industry. In response, 9 commercial and 6 merchant banks became established between 1980 and 1986. In effect, over 50 per cent of the banks that existed through the 1990s were established during this time. In the years immediately after 1986, there was the introduction of a deregulation policy. The policy attracted new players into the industry, as there became a drastic reduction in the density of banking from about 84,000 to about 2,000 persons per bank between 1983 and 1992. The number of banks[3] accordingly rose to 90 and 119 in 1990 and 1991 respectively and never fell below the numbers through the 1990s.

From the regulatory perspective, more banks began to contravene various sections of the Banking Decree and Monetary Policy guidelines as the economy deteriorated in the early 1990s. For instance, of the 74 banks appraised between 1990 and 1992, 55 were observed to be in contravention of the banking laws or regulations at one time or the other (CBN, 1993). This contrasted with the less than 50% of the banks which contravened such regulations in 1988. The directive of the monetary authority that specified that a portion of bank loans should be made to the preferred sectors, such as the agriculture and

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[3] This is used to refer to both commercial and merchant banks until the introduction of the universal banking in 2001.

manufacturing industries were also flagrantly disobeyed. In that light, the banks preferred to contravene the directive and pay penalties rather than being committed to lending to such sectors as their risk content increased. In addition, banks considered the returns from investment in the preferred sectors to be generally low and long termed. Such investments became unattractive to the banks as they could not be matched with the short term nature of the deposit funds. This made the penalties paid for contraventions and shortfalls on lending to Agriculture and Small-Scale industries rose drastically, such that by the end of 1990, the amount has increased to ₦642.4 million from less than ₦400 million in 1988. The continued persistence of the practice in the years prompted some new regulatory interventions that were introduced from 1990, including the establishment of the Nigeria Deposit Insurance Company (NDIC). The regulatory intervention was partly to reform the banking structure, strengthen banks' lending standards[4] and provide a common platform for the regulation of the banking activities. The introduction of the universal banking policy in 2001 was in continuation of the reform. The reform was aimed at harmonizing investment and commercial banking activities in the industry. With the need to correct the structural and operational weaknesses in the system arising from weak financial base, the bank recapitalization policy was introduced on January 1 2006.

Before then, the banking industry was fragmented and characterized by relatively small and weakly capitalised banks with most of them having paid up capital of $10 million or less. The best capitalised bank had capital of $240 million as compared to Malaysia where the least capitalised bank had capital of $526 million at the time (Soludo, 2005). Most of the smaller banks were family-owned and privately held. The asset of the industry was heavily concentrated in a few banks, with the 10 largest banks controlling over 50 per cent of the assets and deposits in the banking system. The recapitalization was intended to expand the capability of the banking sector to drive the economy into higher growth. The reform was part of the fulfilment of the Basel II Accord. Basel II is a comprehensive international set of regulations aimed at enhancing the risk management of the banks. Its three pillars focused on minimum capital requirement, supervisory

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[4] The majority of the loans made by the banks were either uncollateralized or lacked proper/stringent collection procedures

processes and market discipline, which have to do with information disclosure among others. While steps were taken to ensure the full implementation of the accord, having implemented the first with the establishment of the Nigerian Deposit Insurance Corporation (NDIC), the recapitalization policy was a key action towards the achievement of the accord.

Following the reform, only 25 banks were able to meet the ₦25 billion recapitalization requirements, and thereby reduced the number of participants in the industry from 89 to 25 in 2006, and subsequently to 24 in late 2007 following the merger of Stanbic Bank Plc and IBTC Bank to form Stanbic IBTC Bank Plc. (see Table A-1 in the appendix). During the era, a total of ₦406.4 billion was raised from the Nigerian capital market while foreign capital inflow, amounting to $652 million was invested in the sector. The consolidation was focused on further liberalisation of the banking business; ensuring competition, safety of the industry, and proactively positioning the banks to perform the role of intermediation and playing a catalytic role in economic development.

The era of universal banking, fuelled by bank consolidation, led to rapid expansion in the size of the average Nigerian bank. It was an era characterised by increase in financial innovations, number of financial products, and aggressive incursion of banks into insurance, mortgage and capital markets activities. The rapid expansion of the banks grew faster than the regulatory capacity could bear. The loopholes created by the development led to massive executive malpractices, frauds and losses in the system which attracted a number of risks to the economy. The rapid expansion of the banks led to a general complacency that the banks were too big to fail and made the attendant information asymmetry problems that arose to be ignored. In fact, it was as if after consolidating the banks, the regulatory authorities 'went to sleep' with regard to their oversight functions. The fact that the funds at the disposal of the banks rapidly increased had its own problem of adverse selection in management. With the weak regulatory superstructure, financial risks migrated across the different segments of the banking businesses and increased the susceptibility of the whole banking system to crisis emanating from the non-banking segment of the industry, such as insurance, stock-

broking and mortgage. The universal banking policy made the various financial segments to be regulated by same agency. Lack of good coordination and uniform standards among the regulatory agencies contributed to the failure in the proper regulation of the financial industry. The operation of the universal banking requires the banks themselves to uniformly have the human and infrastructural capacities to effectively coordinate all the activities in the various segments of their businesses. With a disaggregated supervision, any weakness in the discharge of a regulatory oversight by one of the agencies will not easily be able to transmit to the entire system. The implication of the above was witnessed in Nigeria in 2008 with the collapse of the equities market, and the migration of risks through the financial system to the banking sector, and endangering the entire banking system.

With the onslaught of the global financial crisis which hit the financial industry in 2008, there was an intervention by the central bank with an injection of N620 billion into the industry to rescue five distressed banks. Subsequently in early 2012, 4 out of the 5 rescued banks were acquired by the stronger banks, bringing the number of licensed commercial banks in Nigeria to 20. Specifically, Access Bank acquired Intercontinental Bank; Eco Bank acquired Oceanic Bank; First City Monument Bank acquired Finbank; and Sterling Bank acquired Equitorial Trust Bank. Savanna bank had been licensed to resume operation since 2012, while Heritage bank had began operation in Nigeria with the opening of the first set of branches in Marina, Lagos (in March 2013) and Dugbe, Ibadan (in April, 2013). This brings to total the number of licensed banks to 22 in Nigeria in 2013. Savanna bank is still waiting to begin operation, leaving the operational number as 21.

After ten years of the introduction of the universal banking model, and five years from the recapitalization of the banks, the banking industry is still heavily undercapitalised, weak and showed symptoms of excessive overtrading (Sanusi, 2011). The poor performance of the universal banking policy led to its suspension in 2011. Reasons proffered by the regulatory body for the abolition of the policy include the need to enhance the quality of the banks, and improve transparency in the banking system. The

abolition was aimed at pushing the banks to focus on their core banking designation as commercial or merchant bank. The smaller banks, based on the size of their operations were required to operate in the capacity convenient for what they were specialised in, while the larger banks had their capital base increased.

Given the overview of the banking industry, a number of things need be done to position the commercial banks for efficiency. First, there is need for movable asset/collateral registry. Such centre would document the history of borrowers as well as the authenticity of the assets which are pledged as collateral for loans. The establishment of credit bureaus have become important innovation in reduce borrowers' asymmetry. With the development, banks and creditors will be able to establish the willingness to pay by checking the credit history of borrowers. And they will also able to check the capacity to pay by looking at the exposure that the borrowers already have before they take on new loans or engagements, to the extent that the creditors have information to determine the capacity and the willingness to pay. If someone has high risk based on the credit report, that person will have to go with high interest rate because if another borrower is known to be a low risk borrower because he services the loan as and when due, then that can make the price to relatively reduce.

2.3   Evolution of Reforms in the Banking Industry

The use of economic reforms to tackle market inefficiencies has been a long tradition in many countries. In Nigeria, the banking industry has pulled through a number of crises over the years which had informed the introduction of several numbers of reforms. The crises were inflicted mainly by failure on the part of the banks and the regulatory authority to build a strong and efficient financial sector. The Central Bank of Nigeria is the apex regulatory authority for the commercial banks. As a result, a change in its policy stance transmits to a change in the operations of the banking industry. The use of reforms has become an important vehicle for executing the policy direction.

The first major action towards initiating a banking reform after independence in Nigeria came with the constitution of the financial review committee in April, 1976 (Nnanna, 2001). The committee were among other things to restructure the financial system to meet

the needs of the country for rapid development and with reference to the activities of the financial institutions generally and make appropriate recommendations. A number of key recommendations from the committee underline the financial reforms of the year. They include: the establishment of a Securities and Exchange Commission; the establishment of the Nigerian Stock Exchange to replace the Lagos Stock Exchange with branches in Lagos, Kaduna and Port Harcourt; all financial institutions were required to henceforth make returns of their financial statistics to the CBN to improve monetary management; setting up of more bank branches in the rural areas of the country; strengthening the banking regulation to reflect the distinction in practice between commercial and merchant banks; and increase in banking supervision and regulation to encourage specialisation of financial institutions. The implementation of the reforms between 1977 and 1989 caused the growth of the rural bank branches to increase from 13 to 756[5]. As part of the implementation of the recommendation, there was the introduction of deputy governors (DGs) in the office of the CBN as part of measures to increase attention to banking supervision. The Nigerin Deposit Insurance Company (NDIC) was also established to strengthen supervision and protect bank depositors.

Banking reforms are made to reflect the changes in the economic situation and introduce new approaches to tacking of challenges in the financial sector. From the beginning of banking in Nigeria till 1952, there was no regulation of banks, and was therefore regarded as a free banking era. Specifically, the collapse of one bank after the other during the period of depression in the 1930s resulted in significant loss of depositors' funds. The loss raised considerable concern within the government circles, and the introduction of regulatory measure into the financial system was a key government response intervention. The regulatory era started from 1952. There were two discernible periods in the era of the banking regulation between 1952 and 1991. The first was the era of limited regulation from 1952-58, and the era of intensive regulation from 1958-1986. The enactment of the banking Ordinance of 1952 marked the beginning of banking regulation in Nigeria. The Ordinance stipulated the provisions for the licensing of banks. A valid banking license was

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[5] Indicating a yearly growth rate of about 47%

required before a banking business can be inaugurated. It stipulated the procedures for banking business by prescribing the mandatory minimum capital requirement for banks. It also did put in place regulations for checking bank failures. The period of intensive regulation of the banking industry began with the CBN ordinances of 1958. The CBN Act of 1958 gave legal backing to the establishment of the Central Bank of Nigeria. With the establishment, the CBN was armed with the power to stipulate measures to curb bank failures, especially of the type that occurred in 1950-51 and 1990s. The CBN was essentially armed to promote and integrate the Nigerian financial system.

In all, seven distinct phases of reform had occurred in the industry since in independence. However, five occurred within the last three decades (see table 2.1).

The first major overriding reform in the financial sector was introduced in 1986, as part of an economic wide structural Adjustment Programme which was based on deregulation and market oriented economy. The introduction of the policy led to the licensing of more banks and increased participation of the private sector in the ownership of banks. The policy was in sharp contrast to the extant regulatory stance of the government which was derived from the pursuit of indigenization policy of the 1970s in the wake of a boom in oil wealth. The federal and state governments had staked majority holdings in most of the financial institutions. The reform was anchored on the need to enhance competition, reduce distortion in investment decisions and evolve an efficient financial system. It concentrated on structural changes, monetary policy, and interest rate administration and foreign exchange management. The broad framework of the reform encompasses both financial market liberalisation and institutional development of the financial sector.

Table 2.1: Major Reforms and their Span in the Banking Industry

S/N	Reform Type	Period	Time Span (yrs)
1	Free banking era	1892-1951	59
2	Regulated era	1952-1991	39
3	Liberalized regulation era with specialist roles	1991-2000	9
4	Liberalized regulation era with universal roles	2001-2005	5
5	Regimented regulation/consolidation	2005-2009	5
6	Regimented regulation/ownership dilution	2009-2011	2
7	Regimented regulation with specialist role	2011-date	15 months

Source: Adapted from Udendeh (2009), and updated by the author

The broad objectives of the reform include: the removal of controls on interest rates to increase the level of savings and improve allocative efficiency; elimination of non-price rationing of credit to reduce mis-directed credit and increase competition; adoption of indirect monetary management in place of the imposition of credit ceiling on individuals; enhance the institutional structure of banking and supervision; strengthen the money and capital markets through policy changes and distress resolution measures; and improve the linkages between formal and informal financial sectors of the economy. Aside from the negative impact of a series of economic crises which started in the early 1980s, Jeanneau (2005) attributed the low depth of bank intermediation in the economy to structural factors, such as a lack of information on potential borrowers, which is itself the result of absence of credit information bureaus, and poor enforceability of creditors' rights in the event of delayed payment or default.

Prior to the introduction of the financial liberalization in 1986, Nigeria had only 40 banks and the financial system was highly regulated and characterised by a regime of ceilings on interest rates, credit contractions, high reserve requirements, and restriction on entry into the banking industry. Though the situation inhibited proper development of the financial system, there was not much threat to the banking industry in terms of deterioration in asset quality through growing accumulation of risky assets. The domineering control of the monetary authority prior to the deregulation shielded the banking system from exposure to the effects of the deteriorating economy through the early 1980s. However, the policy and structural changes which occurred in the banking sector from late 1986 introduced a set of new challenges into the financial system. Interest rate regime became highly volatile, introducing interest rate risk in the context of medium and long term lending (Ogun, 1986). In addition to this, there was a rapid growth in the bank size which over-stretched the number of 'professional' bankers in the system. With the situation, the quality of banking operation deteriorated as conservative but safe professional banking practices which enhanced lending efficiency was abandoned. In effect, the early years of the 1990s witnessed an unprecedented rise in banking risks, bank failures, frauds, liquidity (insolvency) problems and significant distress which were directly traceable to poor loan

qualities[6]. In the main, for every N1000 loan made in 1989, 1990 and 1991, about N410, N440 and N390 were unlikely to be collectable in the three years respectively (see table 2.2). The dismal performances in the banks' lending led to a review of the deregulation reform, specifically in 1991.

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[6] For instance, in terms of loan quality, the total classified loans for the whole banking industry increased from N9.4 billion in 1989 to N11.9 and N12.8 billion respectively. These values represent 40.8, 44.1 and 39 per cent of the total loans and advances made in the three years. In addition, the number of bank staffs involved in frauds increased from 313 in 1989 to 417 and 514 respectively for 1990 and 1991.

Table 2.2: Asset Quality of the Nigerian Banking Industry

Years	Total Loans and Advances (N'Billion)	Classified Loans and Advances (N'Billion)	Proportion of classified Assets to Total Assets (%) (N'Billion)
1989	23.13 (18.52)	9.43(8.77)	40.8(47.35)
1990	26.95(21.2)	11.91(10.79)	44.1(50.9)
1991	32.88(25.1)	12.82(10.67)	39.0(42.5)
1995	175.9(145.3)	57.8(42.9)	32.9(29.6)
1996	213.6(173.8)	72.4(56.1)	33.9(32.29)
1999	370(324.8)	94.79(85.9)	25.61(26.44)
2000	519(468.8)	111.6(104.6)	21.5(22.31)
2001*	803.05	135.74	16.90
2004	1519.76	350.82	23.08
2010	7166.76	1077.66	15.04
2011	7312.72	425.96	5.82

Source: Nigeria Deposit Insurance Corporation (various years)

(1) The figures on the total loans and advances do not agree with table 2.12 because of data sources

*The values in brackets are used to represent the specific amount for the commercial banks in the years until universal banking began in 2001.

Table 2.2 showed that even while the ratios of the classified assets to the total assets remained low within the industry as a whole, actual situation with the commercial banks showed worsening deterioration of assets. The classified assets of the banks in effect represent the non-performing loans in the industry. The table showed a steady improvement in the asset quality of the banks over the successive reforms. For instance, the ratio of the classified assets to total assets which stood at 44.1 and 50.9 per cent for the industry and the commercial banks respectively in 1990 fell to 39.0 and 42.5 per cent as a result of the mild reform introduced in 1991. In 1991, the monetary stance of the CBN shifted from direct control of credit to the use of market-oriented approaches. This was abruptly in response to the profound financial distress that became prevalent towards the end of the 1990. The change was intended to eliminate distortions and inefficiency associated with the use of credit ceilings. While the ratio of the non-performing loan were sustainably high through the decade (compared to the prudent standard of <5%), the reform introduced over the period did not make much impact in the financial industry. In fact, the improvement recorded in 2000, towards the end of the reform regimes was essentially as a result of the revocation of the licenses of three terminally distressed banks during the year.

In the wake of 2001, the banking sector witnessed the return of liberalization and the adoption of the universal banking model. The banking era before the introduction of universal banking in early 2001 was generally characterised by "arm chair banking" as the banks face least competition for deposits and customers. Specifically, a large number of the banks were mainly engaged in arbitrage; seeking government funds to stay afloat rather than engage in core banking services. The financial liberalization brought about the removal of a number of administrative controls by the monetary authority in the financial system, and led to a progressive move towards a market-oriented system with free entry and exit in the industry which spurred a growth in the number of banks in Nigeria. The strategy of the monetary authority was to introduce measures that would increase competition, strengthen the supervisory and regulatory capacity of the CBN (Nnanna 2001), improve the financial structure and redress the financial repression already

identified (Oke, 1995). These were the motives for the introduction of a regime of indirect monetary control, and subsequently the universal banking in 2001.

In 2001, 19 banks, formerly-known as merchant banks, changed their old names, upon the introduction of universal banking and began operation as commercial banks, leading to the beginning of a phenomenon that later became known as the "New Generation Banks". The entrance of these players into the industry exacerbated the fragile health of the banks as further signs of distress began to emanate. In effect, the period between 2002 and 2004 was characterised by poor banking services, poor capitalization, weak loan synergy and inability of banks to finance real sector investment. These effects in addition to others brought to 35 the number of banks that became liquidated within the single decade, 1994 and 2004.

The third banking major reform began with a bank recapitalization exercise which was part of a 13-point reform agenda of the CBN introduced in January 2006. Partly, the exercise was driven by the need to achieve a consolidated, competitive and convergent financial substructure in Nigeria. All banks were required to recapitalize to 25 billion naira on or before 31st December, 2005. The action attracted massive inflow of funds and foreign capital investments into the banking sector (Soludo, 2009a). At the end of the exercise, 25 banks emerged from 75 banks, mostly under merger and acquisition arrangement, while the remaining 14 banks who could not meet the deadline had their licences revoked. The number of subsisting banks was further reduced to 24 banks at the end of December 2007 as Stanbic Bank Plc and IBTC Bank merged to form Stanbic IBTC Bank Plc (see table 2.1). In its efforts to drastically reduce lending rates, the Central Bank of Nigeria in December 2006 replaced the Minimum Rediscount Rate (MRR), the rate it discounts debt instruments, with the Monetary Policy Rate (MPR) to stimulate trading in the inter-bank money and to influence the level and direction of all other interest rates in the money market. Prior to this time, commercial banks seeking liquidity had to rediscount their held treasury instruments purchased.

The aftermath of the reform witnessed a sharp rise in stock prices but without the necessary residual positive effect on the real sector of the economy. While the reform

policy effectively raised entry barriers for those wishing to start banking business, poor credit management by the banks' chiefs became more prominent than ever experienced before[7]. In fact, credit management crisis became the major challenge in the banking industry in the immediate post consolidation years. The short-term favourable economic conditions generated by the reform in the industry, and its rapid growth became mistaken for a permanent one. As equity market prices rose, the expectation that stock prices would continue to rise became cemented in the consciousness of the investing public. Proper regulatory and risk management framework were therefore not put in place. For instance, regulatory capital charges, which should have included credit and market risk charges rather than just only credit risk charge was adopted, even when margin loans were exposed to both market and credit risks. The capital adequacy of many banks hovered between 1.1 and 5.0 per cent instead of the required 10 per cent by the CBN.

The gains of banking reforms in 2005 were however not sustained as the crisis from the global economic meltdown began to bite into the Nigerian economy in late 2007. One of the subsequent effects was the crash in the price of oil at the international market in 2008, which trapped many banks that had heavy investments in downstream oil sector. In part, the effect was also felt in the stock market. As the value of shares and stocks held in the involved banks crashed, huge sum of money and investments became trapped and lost. The effect of this was the experienced in the industry as the balance sheet position of the banks deteriorated rapidly. The deterioration in the balance sheets of the banks engendered a reputational crisis in the industry which dealt a heavy blow to the deposit mobilization of the banks. The effects of the crisis were made worse for the banks as many borrowers who had also invested in shares and oil businesses became unable to repay their bank debts. Following the decrease in economic activity, banks consequently contracted lending to the real sector. Thus, precipitating a spiral web of reduction in domestic capital inflows, pressure on exchange rates, limited foreign trade finances for banks with credit lines drying up for some banks and massive job losses in most sectors of the economy. The result of the crisis led to increased information asymmetry problems

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[7] Such as granting of loans that are not adequately collateralized, margin lending, etc.

in the banking industry. In fact, as at August 2008, 10 out of the 24 banks that had survived the recapitalization exercise in 2006 were noticed to have become "unsecure", while 12 were unsatisfactory (see table 2.3). The crisis in the banking sector was observed to derive from the poor loan decisions and screening criteria which had become ineffective at curtailing defaults in view of the increased credit risks in the industry.

Table 2.3: Ratings of the Nigerian commercial Banks Using "CAMEL" Parameters

Category	Number									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sound	10	13	11	10	5	10	4	3	1	1
Satisfactory	63	54	53	51	47	12	7	18	11	7
Marginal	8	13	14	16	16	3	2	2	3	8
Unsound	9	10	9	10	18	-	1	1	9	8

Source: (i). CBN Annual Report and Statement of Account (various Issues)
   (ii) NDIC Annual Report (2007)

With the crises, the major challenge to the banks became how to restore a public confidence in the face of a deteriorating economy and ensure high quality lending[8]. This was reflected by falls in the value of the quality of the banks using CAMEL rating parameter (see table 2.3).

The deadline for the consolidation of the banks began from January 2006. While the exercise was able to improve the capital adequacy and the quality of the banks in the short run, mismanagement of the new funds posed a new problem for the industry as the gains from the recapitalization was short-lived. A look at table 2.3 revealed that the number of sound banks fell from 10 in the first post-consolidation year to 4, 3 and 1 in the immediately following three years of 2007, 2008 and 2009. The inability of the reform improve the general health of the banks gave birth to the new reform of 2009, at the assumption into office by Mallam Sanusi Lamido Sanusi as the Central Bank Governor. Upon assumption to office, the high credit risks and not performing loans were the principal targets of the reform policy that evolved. This was even as the highest number of non-performing loan was recorded in 2009. A look at table 2.3 shows the outcomes of the past lending decisions on the asset quality of the banks during the period. While being considered for loans, banks subject its borrowers to different types of screening measures in order to mitigate the incidence of default. This action it perform bearing in mind the challenge of having to safe-keep the funds entrusted to it by depositors and channelling same into productive activities (through borrowers) that would ensure timely recovery and adequate returns (Ariyo, 1984). The ability of any bank at fulfilling this responsibility depends to a large extent on the accuracy of its appraisal of the borrowers' application. Information asymmetry, by favouring the borrower than the lender as in our present context, leads to a situation where inefficient allocations to projects are made. The outcome of this outcome is loan default and non-performing loans. Increase in defaults (and also non performing loans) causes bank to increase their provisions for bad and doubtful debts, while the asset quality also deteriorates. In view of the role of lending as a cardinal goal of the banks, the size of

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[8] It should be noted that periods of economic crises are mostly noted for high information asymmetry and loan defaults.

credit extended and non-performing loans in Nigeria therefore become positively correlated. Efficiency in lending requires that loan default (proxied by the size of non-performing loans) reduces while the size of credit mobilization made increases. From the evidences, the rise in the size of loan liabilities has not been matched by fall in non-performing loan sizes as shown in the tables A-2 (in the appendix) and 2.4. Table 2.4 showed the declining level of the commercial banks' risk assets as revealed by larger sizes of non-performing loans to the total industry credits. The ratio showed a high incidence of NPLs which became noticeable after the economic downturn which occurred in the economy in the early 1980. With the span of the decade 1980-1990, there was a heavy deterioration in the size of the commercial banking system nonperforming loans. This also continued for the years 2000 through 2005, and peaked in the year 2009. The decline in the post consolidation years was short-lived as poor corporate governance resurfaced after the recapitalization exercise, worsening the deterioration in the bank's assets especially as the effect of the global recession became transmitted into the domestic economy. This was more noticeable from 2009. The asset quality of the bank deteriorated as the ratio rose from 6.26 per cent in 2008 to its peak in 2009. The highest figure recorded in 2009 was because many banks had channelled huge portions of their loans to the stock markets, and oil and gas sector, which were the most hit sectors by the global economic meltdown.

Table 2.4: Trends of Banks' Non-performing Loans (NPLs) in Nigeria

Years	Non-performing Loans of Commercial Banks as % of Total Credits	Growth of Non-performing Loans to Total Credits
1980	2.7	-
1985	8.9	229.6
1990	11.2	25.8
1995	14.8	32.1
2000	22.6	52.7
2001	19.7	-12.8
2002	21.4	8.63
2003	22	2.8
2004	21.6	-1.8
2005	18.1	-16.2
2006	8.8	-51.4
2007	8.4	-4.5
2008	28*	233.3
2009	32.9	17.5
2010	29.6	10.03

* From 2008, actual figure included amount occurring from margin loans

Sources: (i) CBN Statistical Bulletin (various years)

(ii) International Monetary Fund, Global Financial Stability Report

The decline from 2010 was partly as a result of strict actions taken by the monetary authority to salvage the heavily toxic banks. The introduction of reforms from in 2009 was majorly aimed at reducing the distress in the banking industry. Accumulation of NPLs have been attributed to a number of factors such as economic down turns and macroeconomic volatility, terms of trade deterioration, high interest rates, excessive reliance on overly high-priced inter-bank borrowings, insider lending and moral hazard (Goldstoin and Turner, 1996). Since the last global economic meltdown, precipitated by the huge defaults by the sub-prime debtors of the US mortgage industry, increased attention have become focused on lending defaults and NPLs in financial markets. Mainly, the two have become contemporary issues in credit management and presents a new frontier in financial economics. Within the African continent, evidence showed that the trend varied across the countries.

Table 2.5 show the size of the banking system non-performing loans to the total gross loans across a sample of African countries which were faced with chronic information asymmetry problems between 2001 and 2010. Based on the table, Nigeria and Ghana ranked among the West African countries with highest incidence of NPLs at the end of year 2010. The countries of Egypt, Tunisia and Mozambique were able to significantly reduce the incidence of their NPLs from their high levels (of 16.9, 19.2 and 23.4 respectively) to low levels (11.0, 12.1, and 1.8). In the main, Mozambique recorded the most noteworthy in terms of the reduction. Within the year under consideration, Nigeria was able to marginally reduce her incidence of NPLs from 19.7 at the beginning of 2001 to 17.2.

Table 2.5: The Size of Bank non-performing loans to total gross loans[9] (%) in selected African Countries

Year/Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Nigeria	19.7	21.4	20.5	21.6	18.1	8.8	8.4	6.3	29.1	17.2
South Africa	3.1	2.8	2.4	1.8	1.5	1.1	1.4	3.9	5.9	5.9
Ghana	19.6	22.7	18.3	16.3	13	7.9	6.4	7.7	16.2	18.9
Mozambique	23.4	20.8	14.4	6.4	3.5	3.1	2.6	1.9	1.8	1.8
Swaziland	Na	Na	2	3	7	7.7	7.5	7.6	8.1	8.0
Egypt	16.9	20.2	24.2	23.6	26.5	18.2	19.3	14.8	13.4	11.0
Tunisia	19.2	21.4	24.2	23.6	20.9	19.3	17.6	15.5	13.2	12.1

Source: Computed from World Development Indicator (Various Issues)

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[9] The bank non-performing loan to total gross loans was measured as the value of non-performing loans divided by the total value of the loan portfolio (including non-performing loans before the deduction of specific loan-loss provisions). The loan amount recorded as non-performing is the gross value of the loan as recorded on the balance sheet, not the amount that is overdue.

2.4   The Financial System of Nigeria

The Nigerian financial system comprises of the banks and non-bank financial institutions which are regulated by the Federal Ministry of Finance (FMF), Central Bank of Nigeria (CBN), Nigeria Deposit Insurance Corporation (NDIC), Securities and Exchange Commission (SEC), National Insurance Commission (NAICOM), Federal Mortgage Bank of Nigeria (FMBN), and the National Board for Community Banks. Of all the categories, the deposit money banks, otherwise known as the commercial banks is the most active in the financial industry, and as a result, discussions have been concentrated on it. The economic environment plays a critical role in defining the structure, proliferation and profitability of banking in Nigeria.

The Nigerian banking industry is very much affected by its economic environment. As in most developing economies, the banks are still fragmented, small and vulnerable to changes in the macro economy. With such situation, banks experience a boom when the economic prospects of sectors where most of their loans have been concentrated are improved. This phenomenon has characterised the lending to the oil and gas and foreign trade sectors. These sectors are also the channel through which shocks and exposure to foreign economies are transmitted to the domestic economy. For instance, as the Nigerian economy suffered from the crises arising from the global financial crisis, which was reflected by fall in the international price of crude oil, domestic exchange rate and stock prices crashed. The situation made many banks to suffer huge losses due to their exposure to margin loans and lending to the downstream oil sector. The stock market on its part shrank by about 70 per cent in 2009 and caused an unprecedented growth in banks' non-performing loans (NPLs).

The economic environment of the banks has changed drastically since 1960 to date. In the wake of the country's political independence, the numbers of banks in Nigeria (commercial and merchants inclusive) were very few and mainly foreign dominated. In terms of dominance, the Standard Bank (now First Bank) and the Barclays Bank D.C.C. (now Union Bank) were the most prominent, with the banks primarily financing foreign trade with a little of their lending to indigenous Nigerians, who had little to offer as

collateral for loans. The funding and operating pattern of the banks were foreign trade oriented in view of the primary-product orientation in the economy. The economy then derived most of her revenue from export of agricultural products. Based on the volume of economic activities as at the time, the existing number of banks adequately supported the activities in the economy. There was rarely much pressure on the banks to growth either in terms of the number or branch networks. The rapid growth in number, size and operations of the banks started in 1970 as a result of a number of factors.

First, massive exploration of oil in Nigeria started in early 1970s. As a result, there was the need to increase the number of banks to match the increased economic activities generated by the large scale oil production. Second, there was the need by the government to increase the local control of the retail-banking sector after the civil war ended. In part, the indigenization Decree of 1972 was enacted as a strategy to transfer partially or wholly the ownership, control and management of foreign businesses in Nigeria to Nigerians, of which the banking sector was one of important target. The promulgation led to the acquisition of 40 percent equity by government in the three largest foreign banks: the First Bank, Union Bank and United Bank for Africa. Subsequently in 1976, government ownership became upgraded to 60 percent as the Indigenization decree became amended. This reason gave birth to the phenomena that later became known as the second generation banks, which were created from the 1970s. The banks were mainly government owned, while the period also opened the door to the emergence of the merchant banks.

The dominant position of the government participation in the banking industry in the 1970s among other things worsened the existence of information asymmetry in the banking industry. In part, the appointment of directors to the government-owned banks became dictated by political considerations rather than merit and capability. As a result, the board members became occupied with the interest of their political parties rather than the bank they are meant to serve. In allocation of loans, political consideration was given higher thought than the observed quality of the borrower and the suitability of their project. In view of this, the politicians used to see the loan and advances disbursed to them as liabilities but their own 'share' from the national wealth. This factor, among others

contributed to the chronic distress and liquidations that prevailed in the banking sector in the 1990s.

The foregoing mainly suggests that an efficient and reliable banking system thrive only in a conducive macroeconomic environment. Conducive macroeconomic environment reduces the stress on the banks for survival. As a result, bank-related asymmetries will not be expected to rise in such situation, while easy access to funds by the borrowers will cause them to reduce the incentive to hide information or declare incomplete (partial) information when seeking for loan. Information asymmetry has two main implications in the credit market. It raises the prevailing default risk, as well as leads to reduction in lending to the public. Information asymmetry creates a wedge to adequate pricing of loan by preventing banks from knowing the true characteristics of their borrower. The asymmetry thereby introduces disequilibrium into the market as deposits mobilised (supply) will not entirely transmit to investment (demand). The extent of the disequilibrium increases as information asymmetry rises. For the individual borrowing firms, information asymmetry creates a friction between their internal[10] and externally generated funds in financing. It makes external financing to become more expensive than internal financing - creating a premium which will exist so long that the external financing is not fully collateralized. The premium reflects the deadweight costs that are associated with principal-agent problems that typically exist between lenders and borrowers (Oyaromade, 2006).

Three varied dimensions of information asymmetry can be identified in the Nigerian banking industry: insider-advantaged (Edelberg, 2004), bank-advantaged (Sharpe, 1990) and the borrower-advantaged information asymmetry (Bebczuk, 2003). The insider-advantaged asymmetry is the most typical type of the agency problem in the banking industry. It refers to an imbalance in possession and disclosure of information between bank managers and their shareholders; the managers and the regulators; and between the managers and the depositors. Essentially, the managers (insiders) possess greater quality of information about issues that are of interest to the other parties. The information power

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[10] Generated such as through the issuance of imperfectly collateralized debts

constitutes the main cause of criminal collusion and abuse of corporate governance practice that have become reoccurring in the banking industry[11]. Increased services offered in modern day banking have made the dimension of information flow between banks and their customers pervasive and complicated such that adverse selection can rarely be detected.

The bank-advantaged information asymmetry results when banks act opportunistically to exploit their informational advantage over other suppliers of capital (Sharpe, 1990; Rajan, 1992; Boot, Greenbaum, and Thakor, 1993). The bank uses the information advantage against other banks to extract rent from the captive borrowers (since their quality is hidden to the outside banks). The possession of superior information by a bank about its prime borrowers puts other banks at disadvantage at the ex-post competition for customers. In some ways, the possession of such information asymmetry keeps the borrower attached to his bank even when it is possible to secure cheaper price with another bank. On the bank side, the information power gives opportunity to exploit the borrower since the outside bank will not want to lend to such borrower as it had no information about the quality. Viewed from another perspective, bank advantaged asymmetry arise when banks offers loans outside an explicit contract, such as offering a customer loan without an offer letter establishing the transaction. The absence of such explicit contract on its own signifies that the banks had greater power over the terms of the loan than the borrower. Mainly, the main indicator of bank-advantaged asymmetry is the presence of hidden charges (debits), which are neither contained in the offer letter (where it is issued), or specified a priori. In some situation, there could be collusive action by the management (or the loan officers) of banks to exploit (and defraud) unsuspecting innocent borrowers via illegal debit charges. The collusive action usually come in form of the bank's agent introducing private charges to the borrower which goes to increase repayment burden and precipitate default situation. Bank-advantaged asymmetries underscore the reason why borrowing from an outsider bank is more risky than in the banks that one had established an extant relationship.

[11] Corporate abuse was the cause of a protracted protest in US and some other nations in early 2011. In Nigeria, a number of bank executives were convicted to have grossly abused their corporate privilege, and were sacked in the wave of the bank reform that started in 2009. For a detail of the prevalence in Nigeria, see Sanusi, 2010.

The third and the most pervasive of the classifications is the borrower-advantaged asymmetry. Borrower-advantage information asymmetry occurs in a situation where borrowers possess vital private information about the default likelihoods of a loan (Ogun and Ofonyelu, 2012). It essentially results from a situation in which the borrower has more information about his capability to pay, but which is unknown to the bank. The asymmetry manifests because the determination to repay any loan is a matter of character, and there is hardly any banker who can predict the mind of the borrower as at the time of loan consideration. The general perspective in the literature suggests this mode of asymmetry as causative to most of the lending crises in the past[12]. Thus, information asymmetry is essentially a borrower-dominated phenomenon. The subsection below explores the incidences of bank-dominated information asymmetry in Nigeria.

2.5   Incidence of Frauds and Asymmetry in the Banking Industry

Fraud can rarely occur in any enterprise were there to be perfect (full) availability of information between the defrauded and the fraudster. In the case of the Nigerian banking industry, incidences of frauds serve as a good indicator of information asymmetry (Ogun and Ofonyelu, 2013). In the main, the perpetrators of frauds will rarely reveal that intents to the party to be defrauded until it is executed. Bank's fraud is used to refer to criminal activities that are carried out against the bank by its agents outside (and/or within) the banks. In most of the situation, the occurrence of the frauds could rarely happen without the collusion of the inside agents. A fraud therefore includes all those activities that are perpetrated against the corporate goal of the banking enterprise. By this, an insider-driven fraud manifests the extent by which the supply side of the loan market is asymmetric. In most of the situations, both the perpetrator and the bank management are differently informed (or uninformed) until the action is executed. The occurrences of the various kinds of frauds in the banks result from the asymmetry of the intents by the perpetrating agents with the bank management. Full information to all parties about the intent or occurrence of such fraud beforehand would have led to the foreclosure of the event. Full information disclosure is essentially required for the optimal realisation of a lending

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[12] In Nigerian situation, evidence suggests that this kind of asymmetry dominates the Nigerian banking industry. For further evidence, see Sanusi (2009)

transaction. This suggests that banks are guided by strict observance of their corporate goal[13]. Viewed from the outside, fraud prevalence, such as armed robbery, internet frauds and theft reveals that information within the banks is not being effectively managed. This implies that some inside members are either being careless with information they give to the outsiders, or provides such information wilfully for the eventual perpetration of frauds. Since the losses arising from the related negligence affect the size of the funds available for lending purpose, this kind of situation is classified as part of bank-related asymmetry. For most occurrences of frauds, attempts are usually unlikely to be successful without an insider aiding the action. The key reference of information asymmetry in the banking industry include all such frauds occurring in the form of fraudulent transfers on customers' account, unauthorised debit charges, suppression of deposits made, and other fraud activities. The occurrence of any of these events matters with respect to the extent to which they affect the borrowers' interest rate payable on the loan, willingness to repay and default incidence. The major concern of the study is on how actions which are considered hidden from the bank affect the default probability of loans they make.

Page 40 contains the detail of the cases of frauds and forgeries in the commercial banks over the past two decades. Frauds relate to information asymmetry in the sense that the mere discovery by a borrower observe that a bank (or its loan officer) is fraudulent could make such borrower to be risky. Borrowers tend to react to their being cheated by their bank by choosing to default in payment of their debts. The general evidence suggests that the cases of frauds and forgeries in the banks have generally increased over the last two decades with over 50 trillion naira lost in the industry (see table 2.6). From the bank's perspective, insiders related activities may relate positively with loan defaults as ulterior intent could cause a risky loan officer to activate loans which are known beforehand to be risky. There seem to be a general consensus that information asymmetry encourages

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[13] Ex-bankers and insiders who are well informed about the loop-holes in the lending policy could exploit the opportunity to perpetuate moral hazard. For instance, a situation was reported whereby documents of loans application that had been initially turned-down become revived to activate huge loan. Such kind of loan from the on-set become adverse and is bound to fail. This reason also explains most marginal loans are successful, since they enjoy executive approval. Incorporating this implication of such scenario to our model is left for another study. This study has focused only on information-induced adverse and/or moral hazard that arise only from investment oriented loans.

frauds and wilful defaults, and that the frauds constitute a source of leakage from the banking system.

A look at the pattern of defaults reveals that most part of the frauds happen through one of these activities: fraudulent transfer and withdrawal of deposits from customers' account, unauthorised (excess) charges, and granting of unauthorised loan and overdrafts. The pattern and source of the frauds suggest the involvement and collaboration of key bank agents in the acts (see table 2.8). In terms of categories of staffs involved in the frauds, the supervisors, managers, cahiers and clerks were the most asymmetric of the banks staffs. These categories of staff accounted for 63.3, 51.68, 54.6 and 57.99 per cent of the bank frauds that occurred in 1990, 1995, 2000 and 2010 in Nigeria respectively (see table 2.8). The rate of increase in the fraud activities can be noted to have been at the peaks in 1995 and 1996. These periods doubled as the periods with the worst incidence of macroeconomic instability and the climax of bank crisis in Nigeria (see table 2.6 and 2.10). The occurrences of the loan resultant loan defaults in such situations have underlined the entire bank crisis experienced in Nigeria over the past five decades.

Table 2.6 Cases of Frauds and Forgeries in Commercial Banks

Years	No. of Cases reported	Percentage increase in reported cases (%)	Amount involved (₦'million)	Actual/Expected Total Loss (₦'million)
1989	62	---	98.22	0.015
1990	91	46.8	788.8	0.022
1991	20	-78.0	360.2	0.026
1995	127	535.0	1006.3	226.4
1996	587	362.2	1542	0.371
1997	471	-19.8	3590	224.54
1998	564	19.7	3129	673.5
1999	182	-67.7	6367	2713.4
2000	723	297.3	2185	1073.4
2001	908	25.6	2530	931.4
2002	981	8.0	5000	1400
2003	773	-21.2	9383.7	857.5
2004	1175	52	9600	2600
2005	1229	4.6	10400	5500
2006	1193	-2.9	4600	2600
2007	1553	30.2	8800	2700
2008	1974	27.1	24500	8800
2009	3852	95.1	33315	4100
2010	1532	-60.2	21291	11679
2011	2352	53.5	28401	4071
2012	4527	92.5	15056	4334

Note: The figures in the tables are strictly for commercial banks up to 2000 before universal banking was introduced. The figures were actually very staggering when both the commercial and merchant banks are considered jointly.

Source: NDIC Annual report and Statement of Accounts (Various Issues)

A cursory look at the categories of bank staffs that were involved in banks fraud and forgeries showed a shift in the cadres of occurrence (see table 2.7). During the 1990s, the banking industry was rudimentary and essentially cash-based. As a result, unskilled bank staffs, such as the drivers, security guards and cleaners were important agents of asymmetric risk during the time. Their contribution to the incidence rose from 16.3 per cent in 1990 to 19.68 per cent in 1995, but fell to 16.4 per cent in 2000 as the introduction of universal banking in the decade created the incentive for the banking system to switch to online and other system based banking platforms. By 2009, the contribution of the group had eased off to 1.68 per cent. The role of the drivers and security agents has began rising again in relation to bank frauds. The category of staffs that had maintained the lead in terms of involvement in cases of fraud and forgeries had been the clerks and cashiers, followed by accountants and the executive assistants and the supervisors and managers.

Apart from the incidences of frauds in the banking sector, the size of the system's aggregate bad debts also measures the size of information asymmetry. It is because of the non publicity of the data on bad debts[14] of the banks that the trend of the non-performing loan is often used. Table 2.8 showed the extent and amount of money involved and lost in the yearly fraud cases among the banks. Irrespective of the regulatory actions at assuaging the phenomena, the incidence increased sustainably over the years. for instance, within a two-decade interval, fraud and forgeries cases which were recorded as 91 cases, and involving ₦789 thousand in 1990 increased to 1532 cases and involved over ₦21 billion naira as at the end of 2010. The increase within the last decade was observed to be more phenomenal. For instance, 723 cases of frauds and forgeries were recorded, which amounted to ₦2,185 million in 2000. The cases by 2010 had risen to more than double (at 1532) and the amount involved increased by over 874 per cent (see table 2.8). The worsening incidences of the fraud cases points to the fact that the banking industry is still precariously asymmetric.

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[14] The Nigerian Central Bank rarely makes the information available. The subsisting policy of the bank specifies the data to be for internal consumption only.

Table 2.7: Categories of Banks' Staff Involvement in Frauds and Forgeries

Status	1990		1995		2000		2009		2010		2011	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Supervisors and Managers	57	13.7	151	24.16	132	26.8	94	14.32	92	25.77	89	17.87
Officers, Accountants &Executive Assistant	45	10.8	142	22.72	101	20.5	137	20.88	79	22.13	126	25.30
Clerks and Cashiers	207	49.6	172	27.52	137	27.8	200	30.49	115	32.22	163	32.73
Typists, Technicians and Stenographers	8	1.9	18	2.88	20	4.1	64	9.76	23	6.44	7	1.41
Messengers, Drivers, Cleaners, Security Guards &Stewards	68	16.3	123	19.68	81	16.4	11	1.68	15	4.20	35	7.03
Temporary Staff	2	0.5	16	2.56	8	1.6	150	22.87	33	9.24	7	15.66
Uncategorised Staff*	30	7.2	3	0.48	14	2.8	n. a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total	**417**	**100**	**625**	**100**	**493**	**100**	**656**	**100**	**357**	**100**	**498**	**100**

*Staff whose ranks were not disclosed
Source: NDIC Annual Report and Statement of Accounts (various Issues)

Except for the immediately following year of the banking consolidation (2006), which recorded a steep decline (mainly in terms of the amount involved), the increased financial losses in the post consolidation years appeared to have been fuelled by asymmetry. For instance, compared to the 1229 reported cases involving ₦10.4 billion in 2005, the reported cases in 2006 fell to 1193, involving ₦4.6 billion (CBN, 2006). The figure of the reported cases and losses from 2007 through 2009 rose continuously. In 2010, a total of 1532 cases of frauds involving the sum of ₦21.29 billion and amounting to losses of about ₦11.679 billion were reported. The number of the reported cases rose further by 53.5 per cent in 2011, and involving over ₦28 billion. One common trend in the cases is that even where the numbers of reported cases fell, the amount involved continually increased. For instance, in 1999, the number of reported cases of frauds and forgeries fell from 564 in the preceding year to 182 but the amount involved more than doubled for the period. The actual/expected losses stood at a higher level of ₦2713.4 million relative to ₦623.5 million in 1998. The implication arising from the incidences of the frauds showed that the penalties for discouraging asymmetry were probably not high enough. For instance, none of the top ten banks which peaked in perpetuating these crimes was severely sanctioned during the year. For those who were convict by the law court, severe punishment was not meted on them as to serve as deterrent. The attempt at recovering such funds had not been very successful. In view of this, the average loss through the years continued to increase. The advent of the internet and computer technology had its fair share in the occurrence of frauds. The drive for a cashless economy widened the use of internet banking and suppressed customer deposits. On the general outlook, the top ten (10) banks accounted for 87.1% of the total number of reported cases in 2011. This may not be unconnected with the close watch on the other fourteen, which are either nationalised or on the marginal list. The deep prevalence of frauds in the banking industry is a red signal of the extent of erosion of the public deposits and asymmetry between the bank operators and their regulators. In addition, the sustained loss of such huge sums of money is an indicator that the banking sector is not after all efficient. What is more worrisome is the fact that these depths of crimes are taking place in a financial industry that has rarely grown in terms of its ability to capture the large pool of the

unbanked public. ATMs fraud and fraudulent transfers/withdrawals topped the list of recent perpetrations (see NDIC, 2011, p. 154). Of the 1532 and 2352 fraud cases reported in 2010 and 2011 respectively, 357 and 498 were attributable to bank staff participation. Despite the increase, the losses resulting there from declined by 62.3% from ₦6.43 billion in 2010 to ₦2.42 billion in 2011. The reduction was as a result of better and improved security and internal control measures put in place by the banks for transactions involving large sum of money. In the main, new approaches to reducing asymmetries in the banking sector were introduced in 2010. Incidence of insider abuse by bank owners, directors and management staff are other factors which makes high default incidence rampant among the banks. The insiders are those employees of banks who obtain loan and advances without appropriate collaterals. These actions exist as a contravention of banking regulations. Poor lending and borrowing culture plays a significant role in the entire default incidences in Nigerian banking industry.

Table 2.8: Types of Frauds and Forgeries with their Frequencies in the Commercial Banks

S/N	Nature of Fraud	Frequency 2000 (₦'M)	Frequency 2003 (₦'M)	Frequency 2004 (₦'M)	Frequency 2011(₦'M)
1	ATM Fraud	n.a.	n.a.	n.a.	738
2	Fraudulent transfer/withdrawal of Deposit/ debit charges	141(778.69)	283(4370.2)	309(2382.5)	331
3	Presentation of Forged cheques	173(604.82)	249(2269.9)	368(1759.9)	280
4	Outright Theft	27(333.34)	48(179.81)	49(188.45)	240
5	Suppression of customer deposit	23(52.84)	113(644.51)	201(532.6)	219
6	Fraudulent conversion of cheques	n.a.	n.a.	n.a.	123
7	Non dispensing of Money but registered by electronic journal	n.a.	n.a.	n.a.	112
8	Loss of money to armed robbers	44(234.04)	40(597.2)	55(333.87)	n.a.
9	Granting of unauthorised Loan/overdrafts	29(260.89)	24(222.67)	25(702.97)	n.a.
10	Internet fraud	n.a.	n.a.	n.a.	108
11	Posting of Fictitious Cheques	89(252.40)	16(93.6)	58(311.10)	n.a.

Note: (i) Values in the brackets are in ₦'millons, and represent amount involved

(ii) Unbracket frequency values are given as average for the year

Source: NDIC Annual Report and Statement of Accounts (various Issues)

2.6 Common Types of Asymmetries in Bank Lending

Two types of information asymmetries are common in the banking industry. The occurrence of information asymmetry in bank can be either bank-advantaged or borrower-advantaged. Bank-advantaged asymmetry typify a situation where the seller (hereby referred as the bank) of a policy (lending fund) gains superior information over the borrower in a lending relationship by using predatory lending practices against the uniformed prospective buyer (hereby referred as the borrower), or the buyer possesses fuller information than the lending bank about the factors which affect the default risks. Banks gain information advantage over the borrowers because they could use predatory lending practices against their uniformed borrowers. In the case of the borrower-advantage asymmetry, the borrower is in information advantage because they know more about the "true" expected return on the investment being financed by the loan. Since the lending banks rely on the information provided by their prospective borrowers to process and determine the outcome of their lending decisions, this presupposes that information supplied must be accurate and adequate. The commonest situation is that the agents do have incentive to alter the information to maximize information gain. The borrowers do this by supplying partial information to the bank. For such borrower, declaring all information about him and the project could foreclose the chance of accessing the credit facility. From the bank side, had it made known all the cost implication of the loan to the borrower, such loan may not have been taken up and bank as a result would make no profit. The focus of this study is on the demand side of the market, of which the borrowers are the main actors. By this approach, the borrowers are treated as being the sole source of asymmetry[15]. The presence of information asymmetry essentially creates an opportunity for adverse selection and/or moral hazards. These phenomena whenever they occur are disequilibrium factors, and are undesirable.

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[15] Studies rarely focus on the supply side of the market because of the difficulty in obtaining data from the banks. It was very difficult to obtain data from the banks on their involvement in information asymmetry. This limitation thereby restrained this study to the demand side only. The reference and discussion made with respect to the supply side were based on the information obtained from the credit guidelines of two banks studied.

In a typical loan market, the cost to the bank of issuing loans is increased whenever any of the phenomena occurs. The occurrences of the factors are found to be positively related to the default incidence. Banks know that offering a loan based on high interest rate will affect the average quality of those that will be funded. As a result, allocation of loans based on price mechanism becomes ineffective as such contract will attract more of the high-risks in the borrowing pool and crowd out the low-risks. Since the low risks unavoidably desire to be funded, basing the allocation of loans on market mechanism implies that the safe borrowers would pay higher interest rates to compensate for the higher default likelihood of the high risks. In view of the borrowers' heteoregenity, lending becomes denominated by adverse selection and/or moral hazard. Adverse selection arises as a consequence of borrowers having different probabilities on repayment which is unknown to the bank. Differing repayment probabilities arise as borrowers become heterogeneous and possess private information about the personal quality and the riskiness of the project to be finance. The moral hazard emerges ex-ante as the behaviours of borrowers become influenced by the higher interest rate they are faced to pay. A payment of higher interest rates induces borrowers to select investment projects that are potentially very profitable but with higher probability of failure. This scenario becomes more compounded by the fact that volatile macroeconomic environments (such as inflation) makes loan appraisal more difficult as viability of potential borrowers become dependent on unpredictable economic and financial variables.

The transaction in the credit markets differ from transactions that exist in other types of markets such as the products market because of the presence of information asymmetry. In the product markets, transactions come to an end once payment is made for the goods or services traded. The seller is not concerned about what happens to the good traded as far as payment has been made. The situation in a loan transaction is however different, and gets more complicated as consequent actions after the transaction matters until the last repayment is made. For a successful loan transaction, a great deal of information is required about the quality of the borrower as well as the intended project for which the loan is required for. Lending default results from any of these cases: a bad quality borrower

with a good project; a good borrower with a bad quality project, or a bad borrower with a non viable project. Since each of the three scenarios will potentially lead to a default situation, lending banks seek to avoid any of the occurrences by ensuring that borrowers are adequately screened before being loaned. It is crucial for the bank to know the viability of the project, the loan purpose, the credit worthiness of the borrower as well as his strategic behaviour (Llanto, 1990). The bank worries about how its loan is utilised as well as compliance to the terms and conditions setting up the loan contract. The efficiency of the market is measured with respect to how possible it is to make economic profits by trading on the basis loans even with the presence of disclosed information.

2.7   Borrowing Situation, Default Culture and Lending Relationship in Nigeria

Bank-lending relationship arises when banks decide to supply financial services to borrowers based on the proprietary information it obtained over multiple interactions (Bharath, 2007). The loans made are based on the notion that repayments are payable from the proceeds generated from the investment for which the loan is used to finance[16]. This precludes the role of the collateral as a source of loan recovery. One common phenomenon with the Nigerian banking industry is the general high demand for loans. In the main, the demands have remained invariant with the vagary of the macroeconomic environment. As should be expected, the demand for loan reflects the productivity of the economy. But the demand had remained strictly positive and interest rate inelastic across the business cycles despite the fluctuations in the productivity of the economy. This development contrasts with the prevailing hypothesis in the literature which suggests that expansionary period of the economy will lower NPLs, as firms would be exposed to sufficient streams of income and revenues to service their debts (Louzis et al, 2011). Because of the growth in the size of the loans disbursement during economic boom, a number of the credits fall into the hands of poor quality debtors such that when recession sets in, default occurrence also rises. The Nigerian situation is made worse because of a general prevalence of poor attitude towards loan repayment and the crowding out impact

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[16] This characteristic is peculiar with investment loans. Unlike the consumer loans in which payments are made from a stream of income deriving from outside the loan, e.g. car and housing loans are usually financed from salaries or other fixed-income sources.

of government recourse to the industry for facility. Over the years, the government has increasingly sustained deficit budgets which are being financed by the banking industry. A number of defaults are observed to occur despite the fact that the borrowers are sufficiently not bankrupt but choose to default because of poor values placed on personal reputation. The ability of the bank to recover its loan in default is worsened by the prevalence of weak legal framework and cumbersome loan recovery process. The barriers essentially make it difficult for the lending banks to foreclose collaterals as a recovery measure (Alashi, 2002). In situation where litigation is pursued, delivery of judgement could be so protracted and frustrating. These factors work together to make bank ration credit to their borrowers and thereby increase the cost of doing banking business in Nigeria.

The factors in part contribute to the high rate of loan defaults recorded for some priority sectors, such as agriculture and small and medium industries. Many of the borrowers who were offered credit based on the sector of the business they belong had more incentive to succumbing to wilful default. Some of the borrowers had the notion that bank loans are part of their share in the national wealth. This group has become 'professional' borrowers who connive with bank staff to take loans with no intention of repaying. This is more common when such loans were guaranteed by the government. While the reforms in the banking industry starting from 2010 have drawn down the incidences of defaults, the increasing economic hardships arising in the period also raise the risks for new borrowers to default. The problem with information asymmetry is that it hinders the attainment of banking equilibrium and efficiency. The asymmetry causes the banks either to accumulate large volume of idle funds or ration credits. With rise in moral hazard and/or adverse selection problems, the average credit worthiness of firms declines and hinders their access to loans. The borrowers' preferences and wealth are such that in equilibrium, the demand for loan is not only constrained by the amount available in the banks, but also limited by information asymmetry. The credit view of the monetary transmission channel posits that monetary policy affects the economy through its impact on borrowers' access to credit (via bank loans). The defaults on the loans tend to result from the presence of

moral hazard than adverse selection. For this reason, banks do require that all its loans are collateralised. While using land (and landed property as collateral for loans, bank requires that such property be properly titled. However, over 80% of landed properties in Nigeria are not titled. In situation where they are titled, a lot of them cannot be used for loan as they are either encumbered by family disputes or fraudulent. Even in the used of fixed deposit or cash as a collateral, experiences abound where such collateral measures also fail. Apart from the fact that borrowers are in most instances adversely selected, an honest borrower may yield to adverse incentive after receiving the loan and lead a strategic default[17]. The requirement for collateral helps to reduce the incentive for strategic default as increasing interest rate in such situation would worsen the default incidence. The extent to which collateral requirement and interest rate affect borrower's action depends on the actual investment returns of the project being funded. Collateral requirement has been the main source of disincentive employed by banks to foreclose default. To achieve lending equilibrium, the loan contract must be able to commit borrowers to appropriate efforts via collateral requirement. The lending theory had suggested that fuller information between the bank and the borrower enhances trust which is important in lending consideration. In view of this, more loans will be made and fewer defaults are recorded.

The Nigerian loan market is dominated by the deposit money banks (otherwise known as the commercial banks), microfinance banks and a number of other financial outlets which are largely informal[18]. The dominance among the different groups has been skewed, with the commercial banks being the dominant in the market. Commercial banks, by the basis of their establishment are expected to advantage in the processing of information and the diversification of risk, which are central elements in financial intermediation (Singh et al, 2005). The activity of the informal units exists largely underground, and as a result, it is difficult to assess the size of their activities. In addition, saving and lending in the sector

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[17] Strategic default occurs when a borrower has financial ability to pay back a loan, but chooses to default.
[18] A number of various informal outlets are observed to operate financial services. Studies have suggested a large (Chipeta and Mkandawire, 1991), growing (Chipeta and Mkandawire, 1991; Aryeetey, 1994; Bagachwa, 1995; Soyibo, 1997; and Chipeta, 1998) and wide varieties of informal savings and lending outlets across Africa (Aryeetey, 1995).

are closely interlinked such that both actions are mutually inclusive[19]. Beneficiaries of the loans are usually restricted to only members who must have contributed to the loanable pool. At the basic level, the banks serve the general role for raising investment fund for those in need of large capital, and serve mostly the medium and large scale business enterprises. The microfinance banks whose operations are relatively small and localized serve the small business owners.

2.8   Conditions Considered in Bank Screening Criteria

There are a number of conditions that are considered by banks before borrowers are offered with loans. Borrowers are screened based on their individual characteristics and that of the project they want to be funded. The evaluation is aimed at ensuring that the potential likelihood for the borrower to be asymmetric is reduced. Based on the banks' principle, a borrower is expected to be of good character (integrity), capable (inherently have sufficient cash flow to service the obligation), possess good capital stake (in terms of the net worth), have good collateral (asset to secure the debt) and meet other conditions (that may arise from the borrower and the overall economy). The discussion on each of the considerations is made in turns.

2.8.1   Assessment of the Borrower's Character

The essential ingredients for ascertaining borrowers' character includes integrity, honesty, reliability and the financial dexterity of the individual(s) involved (Nwude, 2007). Further consideration is also given to the ability, experience and reputation in the line of business for which the borrower is considered for. Maturity of age, mental and physiological fitness are given the first order consideration in all cases. Banks measure this information by considering the quality of the borrowers' previous relationships with it. In view of this, it considers information from the borrowers past relationship with it or other banks in a situation where the borrower in question had had relationship with other

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[19] The most popular which includes the Rotating Saving and Credit Associations (ROSCAs), the local lenders (*alajos),* the cooperative and credit unions. There is common trend for traders in similar lines of business to organise themselves around what they sell and form associations from it accordingly. Many of these associations end up becoming a source of savings mobilisations, controlling a sizeable portion of the currency in circulation and provide financial support to its members.

banks[20]. In addition to this, the bank considers the quality and number of referees attached to the loan application, and the quality of guarantor on the loan. Banks are interested on borrowers that are trustworthy and willing to liquidate any loan approved to them with minimum trouble. No bank would want to advance loan to a borrower who had been known to be a wilful defaulter, except such bank (or its insider) want to be asymmetric. Past credit history of borrowers provides veritable source of information for banks about their prospective borrowers. In effect, banks can infer the probability that a potential borrower will (or will not) default on a new loan by examining the frequency with which that borrower has defaulted in the past. Borrowers who had defaulted in past loans are more likely to default in new loans when it is availed to them. If credit reports are sufficiently accurate, lending relationship between banks and their borrowers would become symmetric as both could determine the default likelihood on the loan. As a result, the bank can set appropriate interest rate that is consistent with the borrower's default likelihood, and charge individuals with poor credit report higher interest rate.

However on the importance of the credit reports, the usage posses some sort of problems. First, most credit reports are always incomplete or inaccurate, which leaves some room for the adverse selection problem to be present. Secondly, since new borrowers do not have credit histories, there arise problems in determining the default risk to apply to any of such loans. There arise the needs for alternative strategies to deal with the problem. In the absence of any credit history, many banks attempt to build a reputation for being tough on borrowers who default. The toughness may include foreclosing the assets purchased with the loan money or seeking legal action to receive payment for the funds in default. In some instances, the action may include sending the defaulter to prison. While it is not professional on the part of the banks to be tough on their debtors[21], the extreme actions are usually taken when banks perceive their defaulter as the cause to information asymmetry. The focus of the study hereby rules out the bank as being

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[20] For this, it is required that a borrower present at least three months statement of account of his dealings with past bank(s). This on its own would reveal if the borrower in question is having a loan liability with another bank.

[21] Since a debtor today is a potential customer tomorrow

causative to information asymmetry. In essence, information asymmetry is seen as arising from only the demand side (borrowers).

2.8.2 Assessment of the Borrower's Capacity

Capacity borders on the possibilities that the borrower will be able to raise enough funds from the financed investment to liquidate the loan debt (Nwude, 2007). Banks basically considers a borrower as capable when he has the moral, technical and managerial ability, including specialized advantage to sail the business to success such that the cash inflows will be able to repay the loan. The expectation from every loan financed investment is that the repayment should come from the proceeds of the initiated investment. Thus, capability includes such factors as guaranteed market for the sale of products or services on a continuous basis. Data on the capability of borrowers can be obtained from the records of sales, as in the statement of account, customer's ledgers showing average purchases per month, or per annum, etc. The essence of assessing the customer's capability is to be sure that the borrower is competent to manage the loan when availed.

With the knowledge that banks relies on the volume of turnover in determining the amount of credit facility to be extended, it is possible for fraudulent borrowers to manipulate the entries in the cash flow. Hence, the assessing credit officer needs to exercise great caution in validating the authenticity of the transactions in the financial records. For instance, a borrower may use an exogenous business account to boost the turnover figure. Or he may divert lodgements of sales into another account in order to reduce the amount of COT payable on withdrawals. The key item of interest in the assessment of the capability is the size of the profit with respect to the cost of the loan. Profit here is used to refer to the positive net of sale from expenses. The analyst is expected to be able to capture the entire costs attached to the operations of the business, including accruals and depreciations. Generally, the information from the financial records should be able to give a clear view of the sales figure, and growth potential. The impact of inflation on the present and future sales performance of the venture can only be determined from the knowledge of the economy and the industry.

2.8.3   Assessment of the Borrower's Capital Stake and Commitment

The essence of this requirement is to reduce the tendency for moral hazard. Granting loans without the borrower's personal funds being involved increases the risk that the loan may be abused. The borrower's stake in the investment is required to be as substantial as possible as a way of hedging any potential adverse incentive from the borrower. The size is expected to fall within the desirable range of the capital adequacy ratios (see table 2.8). The borrower's stake in business helps the bank to determine the level of the borrower's commitment and the amount of risk they may be willing to take. The common practice is that at least 60-70% of the capital should be supported by equity. Borrowers' fund for any viable loan is expected not to be below 25 per cent of the amount sought from the bank in the case of high quality borrower. However, higher percentage may be tolerable when other indicators suggest that default is unlikely to occur.

2.8.4   Assessment on Collateral Security

Requiring collateral security before loans are disbursed is one of the veritable practices that are being adopted in banking to foreclose default incidence. In fact, it is the single most important factor that bank uses to commit borrowers to higher effort and repayment. The collateral security intends to cover the loan, and insure it. For an item to be used as a collateral, it is usually required that it should be marketable. Collateral requirement promotes market efficiency by increasing the opportunity cost of default and enhancing loan recovery. Requirement for collateral security is based on the idea that low risk borrowers value their collateral than the high risks. Offering a high value of collateral with respect to the value of the loan sought is seen as an indication that such borrower will commit higher effort to ensure repayment of any loan availed to him.

Even as collateral requirement is an important consideration in loan making, the usefulness lies in the genuineness of the title submitted as collateral. The main problem in the use of collateral during lending is the moral hazard problem associated with it. Most borrowers are used to putting forward the same collateral for several loans, or submitted such item but with fake titles. The consequence of such situations is that the involved

banks will find it difficult to lay claim to such asset in the event of default. This is made more difficult by the cumbersome nature of recovery litigations in the country.

Outside the use of collateral requirement, a number of factors determine the accuracy of bank's lending decision when information available is asymmetric. For smaller loan decisions that could be decided at the branch levels of the bank, the preference of the loan officer about how the loan applicants adequately satisfy the ability and willingness to pay is of greatest essence. But for large loan sizes, the quality of decision controls and the bank's objective forms the basis of the decisions. Usually, the lending policies of banks are guided by some underlying set objectives which are specified by the bank's credit policy. The credit policy defines the goal for the loan officer in approval of loans. Take for instance, a bank's lending policy which attempts to maximize market share (in highly asymmetric environment) disposes the loan officer into recording high bad debts if he goes ahead to pursue the goal. On the other hand, if the goal had set out to minimize the incidence of bad debt, lesser bad debts would have been made. The pursuit of the latter goal implies that the long-run survival and profit of the bank would be threatened, since a number of projects which are potentially viable may be rejected. Had the bank's goal set out to maximize both the market share and minimize the incidence of bad debts, the lending decision would become discretionary, depending on the interpretation the loan officer made to the default risks on the loan applications.

One importance of the use of discretion in lending is that it makes public the general perception of the banks about heterogeneity of risks in the market. As a result, individual banks can make different interpretations to risks from the same loan application. Thus, loan proposal turned down by a bank could be consequently accepted by another bank. Perfect information availability (and disclosure) is expected to lead to homogenous interpretations of the loan default risks. Heterogeneity in loan interpretations arises because of the differences in information possession by the banks. The heterogeneity may have resulted from individual perceptions about uncertainties in macroeconomic variables. Table 1 summarizes the trends of interest rate prices and growth of the commercial bank loans over the years. The trends suggest that a number of exogenous

factors are more important in the consideration of the commercial bank loans. Fluctuations in the inflation rate and interest prices were at variance with the trends of loans approved. This in part suggests why the size of the non-performing loans had been on the increase (see table 2.5). Thus the percentage of non-performing loans to total loans ranged from 8.4 per cent to 32.9 per cent. Since information asymmetry relates positively with loan defaults, the renewed rise in the size of non-performing loan from 2008 can be attributed to rise in information asymmetries in the loan markets. Inflation and interest rates were observed to have sustainably risen from 2008. This suggests that loans default is related to uncertainties and information asymmetry.

Table 2.9: Financial Ratios Useful in Bank Lending Appraisal

Category of Ratio	Names of Ratios	Mode of Computation	Comments
(A) Capital Adequacy	a. Equity to total assets	$\frac{Borrower's\ networth}{net\ total\ assets} \times 100$	Measures what is due to the business owners net of liabilities from the assets. It gives the indication of the extent to which the borrower is committed to the outsiders. It shows the amount contributed by outsiders with that of the owners of the business. 25-50% is desirable
	b. Equity to total debt	$\frac{Borrower's\ networth}{current + long\ term\ liabilities} \times 100$	Measures the extent of current borrowings in financing the business. At least 50% is ideal.
	c. Fixed asset to equity	$\frac{net\ total\ fixed\ assets}{Borrower's\ networth} \times 100$	Measures the monetary value and the fixed assets in terms of the physical and technical conditions, modernity and state of repair and utilization should also be ascertained. 25-50% is ideal.
	d. Equity to cost of envisaged investment	$\frac{Borrower's\ stake}{cost\ of\ investment} \times 100$	Measures the customer's proposed borrowing to the net worth. It should be of interest to know over time as a measure of the owners' confidence in the future of the business. 25-50% is ideal
(B) Capacity to Pay	Retrun on Capital Employed (ROCE)	$\frac{PBIT}{Capital\ Employed} \times 100$	Measure the ability of the management to earn return from the total resources of the business. the higher the employed rate, the better the performance and vice versa.
	Gross profit margin	$\frac{Gross\ profit}{Sales(N)} \times 100$	Measures the amount of gross profit earned on each naira of sales value. The higher the rate, the better. 25 -50% is ideal.
	Net profit margin	$\frac{Net\ profit}{Sales\ (N)} \times 100$	Measures the amount of net profit earned on each naira sales value. The higher the rate, the better. 10 – 30% is ideal
	Return on equity	$\frac{Net\ profit}{Shareholder's\ Fund} \times 100$	Measures the ability of the management to give reward to owners of the business. the higher the rate, the better.
	Operating Ratio	$\frac{Operating\ expenses}{Sales}$ or $\frac{Cost\ of\ goods\ sold}{Sales}$	Measures the proportion of sales value that is consumed by the cost of sales. It shows which area of the business is producing the chunk of the income. How stable is the streams of the flow.
	Current ratio	$\frac{Current\ asset}{Current\ Liabilities}$	Measures the ability to meet debts when due. The ratio of 2:1 is the most recommended.
	Quick Ratio	$\frac{Current\ asset - stocks}{Current\ Liabilities}$	Measures the ability to meet debts when due without selling stocks. Ratio 1:1 is ideal
	Liquid Ratio	$\frac{Cash\ items}{Current\ Liabilities}$	measures the ability of meet debts when due based on cash items only. the ration of 1:1 is desired. A company would be solvent if it has the capacity to repay its debts as at when due. there may be situations when company can be making profit without being in position to meet the immediate obligations to suppliers, bankers, etc.

Source: Adapted from Nwude (2007)

2.9   Pricing of Interest Rates by Banks

Interest rates on loans reflect the price paid by the consumers. The rate charged depends on the demand and supply of funds, as well as other factors in the money market. Banks earn their profit from the net between the lending and deposit rates. The monetary authority sets a limit to the margin that should exist between the two interest rates. The bank' lending rate takes into account the cost of fund[22], maturity profile of the loan, estimated or perceived risks, sector of the economy, central bank regulations, bank's margin and the bank's policy regarding interest rate on credit. The interest rate spread refers to the margin between bank cost of fund and what the banks charged on loans. The spread is needed to achieve the bank's profit goal (Rousseas, 1985). A rough measure of the spread can be made by comparing the prime lending rate - an administered price set by banks for their best customers and the monetary policy rate[23], which can be taken as a proxy for the cost of funds (see table 2.10). The interest rate the banks charge its best rated customers represents the minimum (prime) lending rate. Usually, banks quote their lending rate on a credit based on their minimum lending or prime rate. For instance, a bank rate is usually given as the prime rate plus other charges which may go with the name maintenance charges, processing charges, management charges, etc. which are all related to the default risk. Since all prices tend to move in the same direction in the economy, changes in the monetary policy rate usually determine the direction of change in interest prices across the markets.

Viewed from another perspective, the sources of funds to a bank may determine the price to charge on loans. Essentially, there are two main sources of funds for lending action: deposit and non-deposit sources of funds. The non deposit sources include: Service fees, Cash handling charges, penalties and interests. The deposit sources accrue from the current, savings and term deposits accounts. All banks fundamentally depend on the deposit source for their long-run profit sustainability. The volume of loans granted depends on the size, availability of deposits, credit policy and other internal factors.

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[22] Including deposit rate as well as cost of maintaining such deposits.
[23] Represented as the monetary policy rate.

Table 2.10: Interest rate spreads and the size of banking industry loans

Years	Sav. Dep Rate (%)	Minimum red. rate	Prime lend. rate	Max.lending Rate	Int.rate spread (%)	Inflation Rate (%)	Total Com. Bank loans
1970	3	4.5	7	8	4	1.75	1528.3
1971	3	4.5	7	10	4	1.65	2182.6
1972	3	4.5	7	10	4	9.41	2478
1973	3	4.5	7	10	4	4.61	2898.1
1974	3	4.5	7	10	4	13.53	3127
1975	4	4	6	9	2	33.93	3593.8
1976	4	3.5	6	10	2	21.1	4422.9
1977	4	4	6	6	2	21.48	7311
1978	5	5	7	11	2	13.3	6141.6
1979	5	5	7.5	11	2.5	11.65	6257.3
1980	6	6	7.5	9.5	1.5	10	7742.8
1981	6	6	7.75	10	1.75	21.42	8669.6
1982	7.5	8	10.25	11.75	2.75	7.16	9693.7
1983	7.5	8	10	11.5	2.5	23.22	8468.6
1984	9.5	10	12.5	13	3	40.71	6252
1985	9.5	10	9.25	11.75	-0.25	4.67	6439.3
1986	9.5	10	10.5	12	1	5.39	7734.8
1987	14	12.75	17.5	19.2	3.5	10.18	7826.7
1988	14.5	12.75	16.5	17.6	2	56.04	5588.9
1989	16.4	18.5	26.8	24.6	10.4	50.47	4184
1990	18.8	18.5	25.5	27.7	6.7	7.5	4601.8
1991	14.29	14.5	20.01	20.8	5.72	12.7	4914.6
1992	16.1	17.5	29.8	31.2	13.7	44.81	4630.2
1993	16.66	26	18.32	36.09	1.66	57.17	4528.6
1994	13.5	13.5	21	21	7.5	57.03	4136.3
1995	12.61	13.5	20.18	20.79	7.57	72.81	3673.9
1996	11.69	13.5	19.74	20.86	8.05	29.29	3330.1
1997	4.8	13.5	13.54	23.32	8.74	10.67	6846.9
1998	5.49	14.31	18.29	21.34	12.8	7.86	4492.8
1999	5.33	18	21.32	27.19	15.99	6.62	4984
2000	5.29	13.5	17.98	21.55	12.69	6.94	7340.1
2001	5.49	14.31	18.29	21.34	12.8	18.87	9671.6
2002	4.15	19	24.85	30.19	20.7	12.89	10272.6
2003	4.11	15.75	20.71	22.88	16.6	14.03	11419.7
2004	4.19	15	19.18	20.82	14.99	15.01	12466.1
2005	3.83	13	17.95	19.49	14.12	17.85	13763.5
2006	3.14	12.25	17.26	18.7	14.12	8.24	16238.6
2007	3.54	9.25	16.94	18.36	13.4	5.38	29382.8
2008	3.21	9.75	15.94	18.79	12.73	11.6	37667.4
2009	3.01	7.44	18.62	22.8	15.61	12.6	44826.4
2010	2.2	6.06	17.59	22.51	15.39	13.8	49424.8

Source: computed from CBN Statistical Bulletin (various years)

The rate of interest which bank charges affects the default incidence of their loans. Mainly, the monetary authority specifies a limit of spread which must exist between the bank lending rate and the monetary policy rate. Banks borrow and lend money in the interbank lending market in order to manage liquidity and satisfy regulations such as reserve requirements. The interest rate charged depends on the availability of money in the market, on prevailing rates and on the specific terms of the contract, such as term length. Since asymmetries form part of the components that are being factored in by banks in the computation of their lending rate. Rise in the interest rate spread signify that information asymmetry in the banking industry is increasing. During periods of high asymmetries bank lending tend to be more risky. From table (2.10), we observe that interest rate spread increased from late 1980s and became sustained through the 1990s. However, this does not stop the size of the loan made by the banking system from increasing. For instance, between 1989 and 1999, the interest rate spread increased from 10.4% to 15.99%. Despite this increase, the total loan made increased by over 1300%; from N22 billion to N322.76 billion. The total commercial bank loans grew despite the drastic devaluation in exchange rate and rise in inflation rates through these periods. While the interest rate sustained a double digit rise between 2000 and 2010, the size of the commercial bank loan rose continuously and had more than tripled in 2010.

One main inference from table 2.12 is that the demand for loan was overly increasing as also the asymmetry. In addition, the lending rate kept rising but in contrast with the declining deposit rates. The high rates of interest rates forms the major cause of most defaults amidst a deteriorating economic environment. Table 2.11 shows the size of the non-performing loans as percentage of the total loans. The increase in the size of the non-performing loans reveals that there is high rate of default in the Nigerian banking industry. The main cause of the non-performing loans was as a result of high loan defaults, arising from borrowers' inability to pay their loans. The defaults arise mainly from information asymmetries and increasing economic hardships which work together to cause loan failures and increase economic risks.

Table 2.11: Some Selected Indicators of the Performance of the Banking Industry (1998-2010)

Years	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Non-performing loan as percentage of total loans	19.35	26.44	22.31	16.9	21.7	22.0	21.6	18.1	8.8	8.4	28.0	32.9	29.6	5.82

Source: (i) NDIC Annual Report and Statement of Accounts (1998-2002, 2011)
(ii) CBN Statistical Bulletin and Annual Reports and Accounts (various years)

Table 2.12: Growth of Some Selected Financial Variables

Year	Growth in MPR	Growth in Lending rate	Growth in inflation rate	Growth in Banks' Loans	Growth in deposits
1970	0	0	30.77	59.99	55.85
1975	-12.5	-16.67	78.1	53.24	67.61
1976	-14.29	0	-258.75	47.69	46.67
1977	12.5	0	61.24	103.18	-6.10
1978	20	14.29	-405.99	-4.6	35.61
1979	0	6.67	25.63	12.53	31.40
1980	16.67	0	48.42	37.12	43.65
1981	0	3.23	7.41	35.18	6.67
1982	25	24.39	-150.72	19.72	12.48
1983	0	-2.5	82.1	7.97	16.06
1984	20	20	-71.32	3.69	12.89
1985	0	-35.14	-2097.09	5.79	11.84
1986	0	11.9	92.47	29.02	3.07
1987	21.57	40	-41.07	11.66	27.29
1988	0	-6.06	84.17	11.57	25.90
1989	31.08	38.43	-37.03	12.51	-6.54
1990	0	-5.1	-1137.4	18.14	42.75
1991	-27.59	-27.44	84.28	20.41	35.15
1992	17.14	32.85	52.95	36.51	43.13
1993	32.69	-62.66	20.34	53.65	46.96
1994	-92.59	12.76	20.19	43.43	27.77
1995	0	-4.06	-48.79	53.5	21.19
1996	0	-2.23	-260.52	17.2	22.26
1997	0	-45.79	-40.16	127.55	26.67
1998	5.66	25.97	14.27	-29.22	15.34
1999	20.5	14.21	-5313.64	18.27	44.55
2000	-33.33	-18.58	98.49	57.48	50.67
2001	5.66	1.69	11.89	56.63	35.53
2002	24.68	26.4	-35.83	19.9	16.45
2003	-20.63	-19.99	49.08	26.75	15.90
2004	-5	-7.98	-138.16	25.55	22.53
2005	-15.38	-6.85	13.48	30.11	24.14
2006	-6.12	-4	-35.01	27.7	59.26
2007	-32.43	-1.89	-30.64	90.69	53.85
2008	5.13	-6.27	56.56	43.05	55.42
2009	-31.05	14.39	-8.63	27.68	19.04
2010	-22.77	-5.86	-17.8	18.24	20.48

Source: computed from CBN Statistical Bulletin (various years)

In effect, the worsened economic environment exacerbated the incidence of information asymmetry. The monetary authority's ability to influence the banks' lending weakened as inflation and the economic environment became more volatile and negatively correlated (see table 2.12). As the situation persisted, the borrowers became more asymmetric. Even with the interventionist actions of the regulatory authorities through by the introduction of liberalization reforms in the 1990s, the default incidence in the banking industry did not diminish. Insider abuse (or asymmetry) and inability on the part of the management to rejecting risky loans lead to the distress of further banks into year 2000.

The failure of the banks to manage the unfolding information asymmetries in the granting of loans exposed the banks to the vagaries of economic instability. The economic environment became characterised by high bout of inflationary pressures, falling exchange rate, lack of fiscal discipline, and weak production base and exports. These factors culminate forces which work together to perpetuate high lending rates among the banks, and in part put pressure on the borrowers who eventually default on their financial responsibility. The interventionist actions of the CBN led to the establishment of the Nigerian Deposit Insurance Corporation (NDIC) in 1988 by the government to provide partial insurance for the depositors' fund on the advice of the CBN. The functions of the NDIC complement the regulatory and supervisory role of the Central Bank of Nigeria (CBN). The tough economic conditions of the 1990s, coupled with the withdrawal of public sector deposits from the banking system, underlined the huge liquidity crises that bedevilled the sector in the 1990s. This warranted the need for further interventions to forestall a total collapse of the sector.

While inflation rate rose sustainably high through the decades[24], the lending policies initiated could not bring down the commercial bank's loan-to-deposit ratio which average at 63.71 through the decade. Essentially, loan disbursement throughout the decade grew sustainably, except for in 1998. Loan disbursement decline by 29.22 per cent in 1998 from the 127.55 per cent recorded in 1997 (see table A-9 in the

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[24] Which is an incentive for information asymmetry,

appendix). Lending interest rate was observed to follow the monetary policy rates through the decades; recording strong positive correlations in most of the decades, with the highest through 1980-89. Lending interest rate moved in generally similar direction with the rise in inflation, except for the decade, 1970-79. The strength of the correlation however differed and was weakest in the decade 1990-2000. This may not be unconnected with the wide volatility in the latter decade (see table A-2 in the appendix).

The introduction of the universal banking concept in early 2001 became as a veritable policy attempt by the authority to ease the dichotomy between the merchant and commercial banks, which in part was a regulatory challenge. The universal banking policy provided a level playing ground for all the banks in terms of operations and regulation wise. With a growing evidence of weak financial base, lack of depth and multiplicity of small banks which are not able to finance large investments, there was the need to revolutionise the banking sector. In part, banking overtrade was observed to pervade through the industry. The loan to deposit ratio which had fallen to 51 per cent in 2000 picked up to 65.6 in 2001 and became sustainable high against the prudential maximum of 47.5 per cent (see table A-10 in the appendix). The foregoing led to the recapitalisation and consolidation programme in 2005, which saw to the emergence of 25 out of 75 banks and the eventual liquidation of 14 others. The reform policy effectively raised entry barriers for those wishing to start banking business and stemmed the proliferation of mushroom banks. The immediate post consolidation period was marked by poor credit management[25] and high level principal agency problems (of which adverse selection and moral hazard were dominant). The 2008 loan and debt crises were created partly as a result of cheap and readily-available post-consolidation credit that fuelled a culture where compensation incentives overshadowed prudent credit underwriting strategies as well as robust risk management considerations. The majority of the loans made were observed to lack proper/stringent screening (Sanusi, 2011). By 2009, it was discovered that Nigerian banks could no longer conveniently fulfil their obligations

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[25] Such as granting of loans that are not adequately collateralized, margin lending, etc.

to depositors; prompting a situation which suggested that banking consolidation of 2005 was concluded on false declarations, fraud, and lack of transparency. The post consolidation era brought significant corporate indiscipline, fraud and discriminatory practices into banking operation and regulation in Nigeria.

With the onslaught of a global economic meltdown in 2008 on the domestic economy in 2008, the stocks and oil prices crashed, and trapped many banks that had engaged themselves in marginal lending and/or that had funded heavy oil investments. In effect, as the value of shares and stocks held by the involved banks crashed, huge sum of money became lost and this affected the balance sheet position of many banks. As a consequence, many borrowers who had also invested in shares became unable to repay and this perpetuated further distress in the lending market, such that at August 2008, 10 out of the 24 banks that had survived the recapitalization were noticed to have become unsecure, while 12 were unsatisfactory.

Although the Nigerian financial system has undergone substantial changes over the decades in terms of the structure, number and performance, these have not been able to reduce the occurrence of information asymmetry. While attempt has been made to ensure that licensed banks behave prudently, the purpose of such actions was rarely realized because the legal and institutional framework for recovering loans and enforcing repayment compliance had been weak and lacking. This mainly is the reason for the pervasiveness of information asymmetry in the industry. Since default is costly, and information asymmetry relates positively with default likelihoods, attempt at reducing the incidence of information asymmetry should forms the core of further reforms in the financial sector.

Table 2.13: Magnitudes of Banks Loans in Nigeria, 1980-2009

Year	Total Loans Volumes	GDP at current Basic Prices	GDP per capita	Growth rate of GDP per capita	per capita loan	Growth rate of per capita loan
1980	29243.03	49632.3	725.12	24.98	427.24	33.69
1981	46156.91	47619.7	676.53	-6.70	655.75	53.49
1982	34177.96	49069.3	678.52	0.29	472.61	-27.93
1983	48397.90	53107.4	715.04	5.38	651.63	37.88
1984	40483.35	59622.5	781.43	9.29	530.59	-18.58
1985	147640.89	67908.6	865.79	10.80	1882.33	254.76
1986	355975.73	69147	856.97	-1.02	4411.76	134.38
1987	1655789.87	105222.8	1267.09	47.86	19938.95	351.95
1988	2910476.72	139085.3	1626.96	28.40	34045.44	70.75
1989	4463187.76	216797.5	2463.66	51.43	50719.20	48.97
1990	3024172.06	267550	2954.49	19.92	33395.23	-34.16
1991	1807512.30	312139.7	3350.54	13.40	19402.03	-41.90
1992	1866802.35	532613.8	5564.00	66.06	19501.72	0.51
1993	1254241.74	683869.8	6952.72	24.96	12751.54	-34.61
1994	1709998.39	899863.2	8903.54	28.06	16919.29	32.68
1995	2967886.61	1933212	18615.42	109.08	28578.59	68.91
1996	4292665.59	2701719	25318.57	36.01	40227.77	40.76
1997	4317961.49	2801973	25554.48	0.93	39380.57	-2.11
1998	3157159.92	2708431	24039.68	-5.93	28022.54	-28.84
1999	3164374.87	3194015	27590.27	14.77	27334.23	-2.46
2000	5097173.54	4582127	38520.49	39.62	42850.32	56.76
2001	14788014.53	4725086	38657.97	0.36	120987.13	182.35
2002	24902698.05	6912382	55037.95	42.37	198280.94	63.89
2003	28299881.10	8487032	65765.45	19.49	219293.93	10.60
2004	73003995.56	11411067	86055.01	30.85	550549.73	151.06
2005	140875094.76	14572239	106949.86	24.28	1033922.88	87.80
2006	230341674.13	18564595	132600.46	23.98	1645250.67	59.13
2007	191343284.93	20657318	143599.19	8.29	1330121.41	-19.15
2008	354785362.85	24296329	164375.41	14.47	2400279.84	80.46
2009	447859328.32	24712670	162718.24	-1.01	2948887.42	22.86

*Measured at current basic prices
Sources: (i) CBN Statistical Bulletin (2009)
          (ii) 2011 World Economic Outlook (population estimate)

2.10   Nigerian Banking Industry and the Banking Environment

The Nigerian banking industry[26] is faced with the twin responsibility of resource mobilization and intermediation of funds between the surplus (saving) and deficit (borrowing) units of the economy. But the achievement of this task requires that information availability is symmetric between agents in the two sides of the market. The Nigerian bank-borrower lending relationship is characterized by asymmetries in information disclosure, possession and transmission. The information asymmetry constitutes a wedge to the process of transmitting deposits to loans. In addition, it undermines the building of trust and confidence which is necessary for successful banking operation. Incomplete disclosure and/or possession of information by either the bank or its customers during loan considerations is known to worsen lending inefficiency as some savings will not be intermediated. With information asymmetry, loans made become likely to turn bad or are lost.

Information asymmetry works to encumber accurate assessment of borrowers' quality during lending considerations and as a result increases the likelihood that borrowers who secure bank loans would be risky[27]. The main consequence of information asymmetry occurring is that it leads to market failure and lending disequilibrium. The impact of information asymmetry in financial market is transmitted through rise in the prices of the system's products and services. Banks are known raise their interest rate to compensate themselves during asymmetry. But the rise in interest rate excludes the safe borrowers from the lending pool in favour of the high risks. The occurrence of latter situation is the reason for adverse selection and higher default risk incidence in the banking industry.

There are a number of reasons why the Nigerian banking industry needs to be efficient. First, the commercial banks constitute the major player in the financial system of the economy. As a result, improvements in the industry's activity go a long way to enhance the growth of the economy. Second, the banks represent the

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[26] Used in specific term to refer to the operation of banks as they dominate the financial markets in Nigeria.

[27] This is the source of adverse selection problem in the industry

commonest formal financial outlet for members of the public in need of loans. As a result, improvements in the banks' supply of credit relates positively with the national output. The extent to which the banking system contributes to the development of the real economy is an important determinant of the financial system efficiency (Sanusi, 2010). Thirdly, inefficiency of formal financial institutions contributes to the proliferation of the informal outlets in Africa. Since the informal outlets are not subjected to reserve requirements and other regulations as affecting the banks, the informal financial institution thereby competitive with the formal institutions, leading to the perpetuation of financial dualism. While financial market inefficiency may partly contribute to the economic backwardness of most of the developing countries (Nnanna, Englama and Odoko, 2004), the quest to participate in global financial markets and guarantee a healthy domestic banking industry requires that the Nigerian financial system be positioned for efficiency. Competitiveness at international market can only be guaranteed if there is a sound and stable banking system internally

While a positive relationship between financial markets and economic growth are established in the literature[28], the relevant link for the existence of the relationship is related to the efficiency of intermediaries. Information asymmetry therefore acts as a binding constraint to the financial sector development (Nnanna *et al*, 2004). The inefficiencies are related to the rise in bad loans, poor market concentration and financial retardation. With the dominance of the financial markets by the banking industry, efficiency in bank lending forms the core of the financial market development. High information asymmetry transmits to high transaction costs and moral hazards (including adverse selection). As a consequence, the banking institutions do not only become faced with the challenge of intermediation, but also with the loss of loaned funds.

Information asymmetries in lending arise because banks and their borrowers are faced with a mutually conflicting interest on the proceeds of the loan-financed investment. Whereas banks are interested in the maximization of their returns on deposits, the

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[28] See, for instance, Goldsmith (1969); McKinnon (1973); Shaw (1973) and Levine (1997).

borrowers are attracted by the size of the rate of return on the financed investment. By implication, borrowers are more likely to be attracted to risky investments which are more profitable but with higher default content – which is unacceptable to the bank. Usually, borrowers with such risky proposal (including intent to default) in attempt at attracting favourable consideration hide revealing information from their banks while seeking for loans. The consequence of the above is the reason why bank's rate which had seemed satisfactory prior to the disbursement of the loan become unacceptable as the ex post realization from the investment will fall below the priori expectation and lead to default. As a start-up on all loan application, every loan is evaluated based on its risk content and how much action can be taken to prevent default. A loan is approved (and disbursed) when it is considered safe and profitable[29]. The safety of the loan implies that there is certainty of repayment from the intended investment or that the resources with which the loan is secured can adequately offset the value of the loan. Profitability, on the other hand implies that there is a positive premium between the loan returns and the cost of fund.

2.11   Structural Changes in Nigerian Banking

The ability of the banking system to impact on the domestic economy depends to a large extent on the size of its assets. In the case of the Nigerian banks, loans and advances constitute key asset of the banks. The structural changes in the various sectors of the economy form the basis of the structural change analysis in the banking industry over the past five decades. According to Lambo (1986), four main methods are commonly used in social sciences for estimating structural changes in an economy. The methods include: (i) the ratios or proportion method, (ii) the analysis of variance method, (iii) the regression (or Chow test) method, and (iv), the decomposition analysis method. This study adopts the decomposition analysis approach because of its simplicity and comprehensiveness. The use of the approach requires that the performances of each sector of the economy is compared (in ratio)

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[29] Based on the guidelines set by the board of directors to loan officers as to the types of loans they should make

with the aggregate total loans from the banking sector. The procedure for the approach is as follows:

Let t = periods, denoted as 1, 2…51, such that t_1 is 1960 and t_{51} is 2010.

n = number of sectors considered, which in this case, n=4

Y^t = total loans and advances made to all sectors in period t.

Y_i^t = total loans and advances made to sector i in period t (i= 1, 2, 3, 4)

P_i^t = proportion of year t's loans and advances made to sector i

D_t^{t+1} = loans and advances decomposition measure for the succeeding and t+1 where t=1,2,3,…50

Given that $Pit = \frac{Yit}{Yt}$ for all i and t, and that $Pit = 1$ for t=1,2,…50

The loans-advances decomposition measure is therefore defined as

$$D_t^{t+1} \; = \; P_i^{t+1} \, logP_i^{t+1} - logP_i^{t+1}; \; 1=1, 2, 3, 4 \tag{2.1}$$

$$= \frac{Yit+1}{Yt+1} \, log \, \frac{Yit+1}{Yt+1} \; - \; log\frac{Yit}{Yt} \tag{2.2}$$

$$= \frac{Yit+1}{Yt+1} \, log \, Y_i^{t+1} - log \, Y^{t+1} \; - \; log \, Y_i^t + log \, Y^t \text{, for all } i = 1,2 \; 3, 4$$

$$t= 1, 2, 3 \ldots 50 \tag{2.3}$$

Each of the equations (2.1) – (2.3) yields the loans-advances decomposition measure. In view of the fact that the time horizon covered is 51 years, the application of any of the formula gives information on the occurrence and the extent of the structural changes that had taken place over the time. In effect, the specification in equation (1) was estimated. The commercial banks' allocations of loans and advances to the different sectors are expected to be in response to the differences in the demand for loans in each of the sectors. Based on the broad classification of the sectors by the Central Bank of Nigeria (CBN), each of the individual sectors is identified under each of the following four broad categories as follows:

1. Production: this includes agriculture, forestry, fishing, manufacturing, mining and quarrying, real estate and construction

2. General commerce: this includes bills discounted, domestic trade, exports, imports

3. Services: includes public utilities, transport and communication, credit to financial institutions

4. Others: This includes government, personal and professional, and miscellaneous.

The four broad categorization form the basis of the four sectors for which results were presented. Tables A-1-5 (in the appendix) show the sectoral distribution of commercial banks' loans and advances to each of the four sectors between 1960 and 2010. By applying equation (1), the decomposition table was derived, and presented as table 2.1. The table showed that there have been serious structural changes in the loan-advances composition of the commercial banks over the period of study.

Important to the structural change in the activities of the banks in the first decade after independence is the fact that the Central Bank of Nigeria (CBN) was established at the commencement of the period. This in part led to the strengthening and localization of substantial activities of banking in Nigeria through the years and into the other decades after the 1960s. The establishment of the CBN supported the pursuance of an indigenization policy which led to growth in the number of local banks in response to the extant dominance of the banking industry by the foreign expatriates. In the light of this, the number of commercial banks rose from 12 with 158 branches in 1960 to 15 with the branches rising to 223 in 1965 (see table A-8 in the appendix). With the developments also, the aggregate deposits and loans from the banking sector deepened over the period, such that by the end of 1966, the total deposits with the Nigerian banks had increased from £21.8 million and £116.4 million with the indigenous and expatriate banks to £26.6 million and £121 million respectively[30]. On the assets side, the loan and advances also increased from about £100.5 million to £246.5 million within the same period. The rapid increase continued such that by the end of 1970, the size of the commercial bank branches had reached 270 nationwide. One important fact that is worthy of note in the structural change of the first decade is that despite the magnitude of growth in the

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[30] The period between 1967 and early 1970 marked the civil war period. Thus, discussions have been focused outside these periods.

banks, the sectoral composition of recipients of the banks' facility were few. As a result, the decade recorded the least structural change within the period under review.

In the second decade after independence, the rise in the number of banks saw the branch sizes more than doubling within the decade. The number of banks increased from 14 in 1970 to 20 at the end of 1980 and the branch sizes soaring from 270 to 733 in the periods. The growth in the size of the banks in the 1970s was driven an economy-wide boom resulting from increase in the revenues inflows from crude oil sales. The upsurge in oil activities expanded the activities of the financial markets, and attracted new players into the industry. This caused the loans and advances to the various sectors of the economy to rise.

Within the succeeding decade, 9 commercial and 6 merchant banks were established between 1980 and 1986. Essentially, over 50 per cent of the banks that existed through the 1990s were established during this time. In the years immediately after 1986, there was the introduction of a deregulation policy. The policy attracted new players into the industry, as there became a drastic reduction in the density of banking from about 84,000 to about 2,000 persons per bank between 1983 and 1992. The number of banks[31] accordingly rose to 90 and 119 in 1990 and 1991 respectively and never fell below 90 through the decade. As a result of the increased size, the volume of loans and advances in the decade rose significantly; rising from N48.96 million in 1970 to N458.51 million by the end of 1980. With the sectors of the economy, real estate and construction, trade and transport and communication joined as major recipient of the banking system loans and advances. These trends became sustained into the two following decades.

On the overall, the year 2005/06 witnessed the most significant structural changes. This development was partly attributed to the new recapitalization which took place in the year. The recapitalization among others reduced the number of banks from 89 to 25, but lead to an increase in the aggregate loans and advances for the year. As at

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[31] Used to refer to both commercial and merchant banks until the introduction of the universal banking in 2001.

the first year after the recapitalization exercise, the massive fund pooled into the banking sector became a major source of information asymmetry problems as there was the need by the bank executives to properly channel the funds into viable investment to attract returns to the owners of the capital. Within the period of the recapitalization boom, there was already a proliferation of unprofessional bankers across the banks which increased the moral hazard risk for the industry. The structural transformation occurring through the time was however short-lived as distress crisis emanating from poor management credit management, weak corporate governance and lending practices and the global economic depression occurring in the immediate years after the consolidation hit the economy from late 2007. Despite the strong interventionist action by the monetary authority in the wake of the economic meltdown, the pace of the structural transformation in the banking industry slowed down compared to the years preceding the recapitalization (see table A-7). In the five decades considered, the structural changes were strongest in the decade 2000-2010. The structural change in the decade was because of the emergence of more sectors as recipient of the commercial banks' loans and advances. Specifically, the agriculture, manufacturing, export and the mining (oil) sectors were the dominant recipient of the loans and advances. The years 1960, 1961, 1963 and 1969 were the years with the least structural change.

2.12   Summary of Discussion and Implication

Chapter two provides a background on the operation of the banking industry in Nigeria over the past five decades. The evolution of banking in Nigeria pre-dates the nation's independence. However, actual development of the banking industry began after the establishment of the Central Bank of Nigeria in 1959. For most of the banks which in Nigeria prior to the independence, the challenges of poor capital base, incompetent management and stiff competition from foreign competitors crippled their development. In part, lack of proper regulatory framework (free banking regime) within the industry during the time led to massive bank failures. With the establishment of the central bank, the platform for the coordination and regulation of

banking activities was laid. In maintenance to this, the Nigerian Deposit Insurance Corporation was also established in 1988 to complement the CBN's role in the financial system. Despite these interventions, the banking industry experienced another crisis in the 1990s. The crisis was due to poor corporate governance, insider abuses and ripping of customers. In attempt at taming the crises, the universal banking model was introduced in 2000 and subsequently the bank consolidations exercise in the year 2005. At the dawn of the global economic meltdown in 2009, it had become glaring that the banks needed deep intervention to salvage the system from distress and collapse. Thus, the central banks injected N620 billion into the sector with the attendant collapsing of the bank size from 24 to 20.

A look at the tale of the Nigerian banking industry shows that decisions bordering on the management of deposits (deposits) and making of loans have been the root causes of all of the crises experienced in the industry. Implicit in the mismanagements are adverse selection and moral hazard risks. The crux of the discussion in this study is centred on the how the two information asymmetry problems have impacted on the quality of loans that banks make.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

The review is organized into five sections. Following this introductory section, section 3.2 contains the conceptual literature. It detailed on what constitutes information asymmetry and how the factors affect the efficiency of loans that banks make. Section 3.3 contains the theoretical literature on bank lending relationship, and the link between information asymmetry and the financial sector performance. Section 3.4 reviewed the methodologies used by past similar studies and the reason for the adoption of the method employed for the study. The chapter ends with section 3.5 which reviewed past findings in the literature on the subject matter.

3.2 Conceptual Issues

Information asymmetry describes a situation where parties involved in a contractual relationship do not have equal information on the characteristics of their transaction. In the case of bank lending, information asymmetry occurs when a bank (borrower) has different (or unequal) information as the borrower (bank) about the characteristics of the project sought to be funded. In most instances, it is the case that the information is either ignored or is inaccessible to one of the parties (Bebczuk, 2003). For most lending situations, borrowers do have more information than their banks about the capability to pay and quality of the project to be funded. This reason explains why reviews on information asymmetry have focused on the borrower as the source of asymmetry despite the fact that banks are known to be in the advantage when they use their predatory lending practice against their uninformed borrowers during lending relationships. The conception of a bank possessing information advantage is based on the presumption, made by Kane and Malkiel (1965), Fama (1985) and Boot (2000), which banks learn more about their borrower's characteristics than do other banks as they lend to them. The information banks

garner in the process of their lending offer them some advantage against ex-post banks in the consideration for future loan. The fundamental consequence of asymmetric evolution of information for banks is the creation of potential ex-post, or temporary monopoly power to the benefiting bank against other banks competing for the customer. The principle of bank lending is hinged on the fact that bank lends only when a close relationship had been established between it and their borrowers. The quality of such relationship has been shown to facilitate monitoring, screening and reduction of asymmetric information problems (Boot, 2000) in lending. The magnitude of occurrence of bad debts, loans defaults and lending frauds are evidences that banks either do not use evolving information in their lending considerations, or faced information asymmetry in the course of their use of such information. The role of relationships in bank lending forms the core of the review in the subsequent sections.

3.3   Theoretical Review

Economic theory emphasizes the role of information asymmetry and unequal possession of private information in explaining credit market failures (Vickrey (1961); Akerlof (1970); Mirrlees (1971); Stiglitz and Weiss (1981); Myers and Majluf (1984); Baltensperger and Devinney (1984); and Crawford (1984) and Dobbie and Skiba (2012)). For this, the financial market and institutions exist to resolve the asymmetry in the markets. Banks do this by economizing on collection and processing of information necessary to make investment and lending decisions (Pertersen, 1999). Asymmetric information hinders efficient operation of credit markets by distorting the pricing of capital with which lenders can make profit (Stiglitz and Weiss, 1981). Quality relationship between banks and their borrowers is core to resolving information asymmetry problems. A better relationship would generate useful information to the bank to constrain borrowers from being asymmetric. Efficiency in bank lending is related to the quality of durable[32] information it collects from the borrowers in the evolution of lending relationship.

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[32] Such information must be useful as an input to the lending decision over multiple periods (see Petersen, 1999, p. 1).

Fama (1985), Fischer (1990) and (1990) argued that banks generate inside information as banking relationships evolves. By managing customers' accounts, banks gain access into their private information which enhances efficient allocation of loans. Through the management of customers' account, an implicit relationship is established, and this provides a source of insider information necessary for lending consideration. Borrowers who have not established this kind of relationship stand at disadvantage at subsequent lending relationship.

Economic theory suggests that firm's closeness with bank and availability of information leads to lower cost of capital and greater availability of funds relative to firms without such ties (Diamond, 1984, Haubrich, 1989, and Diamond, 1991), and lower default likelihoods. Effectively, as long as banks know much about their borrower's type and investment opportunities, loans made tend to be effective. But if the bank does not know, market failure occurs, and loans made become likely to default. Efficiency in bank lending depends mainly on the quality of information available between banks and the borrowers. One market solution is the banks' use of information obtained in the loan origination process. The information produced may arise from multiple of sources. The credit reporting agencies are useful in the aggregation of information from multiple sources into easy to use indexes for the banks. Aside this important role by the agencies, the banks rely on the advantages of the relationship to collect information about borrowers which cannot be easily reproduced by any other financial institutions to gain competitive advantage. Banks can learn about a firm by observing it over time. The bank observes the firm's repayment history as well as other information about the borrower through the loan officer. History with the bank raises the expectation that the borrower in question is a good credit risk (Diamond, 1991).

Despite the information advantage enjoyed by the bank, the supposedly advantage position in the lending relationship changes after the loan is made. In effect, bank's position transfers from that of a fixed claim holder to that of an equity holder in the funded investment until the loan made is repaid. The impact of information asymmetry in the banking industry is transmitted via the credit channel of monetary

transmission. The credit view channel stresses that monetary policy affects the economy through its impact on the borrowers' access to credit, especially bank loans (Repullo and Suarez, 1999). The Bank lending channel hypothesis is hinged on the existence of perfect information disclosure between borrowers and lenders. In view of this, the occurrence of information asymmetry limits the validity of the bank lending channel hypothesis. For banks financing private borrowers, imperfect information disclosure to the banks creates a wedge between supply and demand for loanable funds, such that investment projects that are worth financing become unfunded. Information asymmetry makes it difficult for banks to make accurate evaluation of prospective borrower's application for loan. This in effect causes potential bad credit risk borrowers becoming the ones who will actively seek out for loans, even at higher interest rate. As a result, borrowers with risky projects will be funded while the safe borrowers fizzle out of the market[33]. Faced with this challenge, charging higher interest rate to cover inherent risks will increase the lemons in the market[34]. The other consequences of market failure includes banks' employment of non price screening methods, such as credit rationing (Stiglitz and Weiss, 1981) and collateral requirement (Bester, 1985, 1987).

Credit rationing refers to a situation where lenders limit the supply of additional credit to borrowers who demand funds, even while they are willing to pay higher interest rates. Implicit in the occurrence of credit rationing is a breakdown in the market mechanism and a disequilibrium which is occasioned by the occurrence of information asymmetry. It results from a situation where banks become either unwilling to advance additional funds to borrowers at the prevailing market interest rate even when they are willing to pay higher interest rates, or the borrowers are required to receive smaller loan than the amount applied for at the given interest rate. Based on Stiglitz-Weiss analysis, banks by raising their interest rate suffers from adverse selection as only the risky borrowers will want borrow at higher rates. Safe

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[33] The safe borrowers will not be willing to pay high interest rate in view of their low probability of default and investment profitability. The risky types will accept to pay higher rate because they have higher chance of defaulting (and typically a higher return if successful).

[34] Lemons refers to bad outcomes such that can give grief (see Akerlof, 1970)

borrowers will prefer some rationing if they can obtain small loans sizes at lower interest rates, while the riskier borrowers will prefer larger loan size even at higher rate. The debate in the credit rationing literature have been defined by the contributions of Jaffee and Modigliani (1969); Jaffee and Russell (1976); Rothschild and Stiglitz (1976); Stiglitz and Weiss (1981) and De Meza and Webb (1987). The suggestion that banks ration credit is a fact of experience which transcends modern economic discussions (Oyaromade, 2006). The contentious issue concerns the justification for the practice and rationality for the attainment of lending efficiency. Evidence of rationing of credit to worthy borrowers was noted to have been documented in the literature as far back as the early 20th century by Calomiris and Hubbard (1989). In the main, the intensity of the rationing followed the business cycles (Sprague, 1910; and Persons, 1920). The nature of macroeconomic policy pursued may be useful in assuaging or compounding information asymmetry problem in the financial market. Generally, expansionary macroeconomic regime tends to assuage the occurrence of credit rationing than during contraction. Banks adopt credit rationing as an optimal lending strategy to attain equilibrium when information is asymmetric (Rothschild and Stiglitz, 1976). The distributional impact of economic policy in asymmetric environment causes the costs of finance to respond differently to different types of borrowers (Hubbard, 1995). Information asymmetry essentially makes the net worth of assets of borrowing firms to become reduced. This in effect means that lenders will have less collateral for their loans, such that losses from adverse selection are more likely. With the rise in adverse selection problem, there will be decrease in lending to finance investment spending. Lower net worth of business firms also increases moral hazard problems because it means that owners have a lower equity stake in their firms, giving them more incentive to engage in risky investment projects (Oyaromade, 2006, pp. 227). Since taking on riskier investment projects makes it more likely that lenders may not be repaid, a decrease in business net worth leads to a decrease in lending (Mishkin, 1997).

In general, credit rationing model explains equilibrium risk-sharing arrangement between banks and its customers when information concerning them is asymmetric (Stiglitz and Weiss, 1981). Banks making loans are concerned about the interest rate they charge (returns) and the riskiness of the loan. This is because the interest rate that it charged affects the riskiness of the loan by altering the potential borrower's incentive (the adverse selection effect) and/or affects the actions of borrower after the loan is disbursed (the moral hazard effect). When banks find it difficult to observe individual characteristics in the pricing of its loan, borrowers who have adverse characteristics will have the incentive to exploit the information gap to perpetuate moral hazard. The presence of adverse selection suggests a situation where unused observable characteristic (of the borrowers) correlate with their risk types, even when there are no difference in risk status across the borrowers group.

Stiglitz and Weiss (1981) assumed that interest rate directly affects the quality of loans because of adverse selection and/or moral hazard effect. By implication, the interest rate that banks charge on the loan affects the riskiness of the loan. For any given loan rate, the bank will earn lower expected return if it make loan to borrowers with riskier projects than to the good quality borrowers. Interest rate affects the riskiness of the loans by sorting prospective borrowers (the adverse selection effect), or by affecting the actions of borrowers (the moral hazard effect). When price (interest rate) affects transaction in this way, the loan market will then fail to clear (market failure). The bank therefore seeks for optimal interest rate that will maximise the expected return to its funds and at the same time minimise default risks. Since adverse selection and moral hazards are undesirable[35], banks are essentially concerned about how to avoid default incidence or reduce its likelihood where avoidance is inevitable. In addition, self-financing arising from costly loan terms, or credit rationing are both undesirable.

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[35] Adverse selection increases the likelihood of loans being made to bad credit risks, while moral hazard lowers the probability that a loan will be repaid

The role of information asymmetry in bank lending can be explained from two main strands. Firstly, lending constitutes one of the key functions[36] of the commercial banks. In fact, it is the core means by which monetary actions are transmitted into the domestic economy as well as the basis of most banking revenue. Secondly, through lending actions, banks are able to transform risk characteristics of their customers into their own asset, and generate profit there from. The capacity of banks to overcome market failure and resolve information asymmetry problem thereby determine the extent to which banks fulfil their intermediation role. It is therefore not uncommon for banks to operate specialized financial services to reduce the cost of obtaining information about borrowing opportunities and default foreclosure of their customers (Mishkin, 1997). Banks, through their lending relations undertake to mitigate or resolving informational asymmetry problems.

Bank loans go bad for either of these two broad reasons: the borrowing firm run into difficulty, or the borrower engages in fraud (Koford and Tschoegl, 1997). The ability of any bank to avoid loan failures depends to a large extent on the accuracy of the appraisal of the borrower's application. Information asymmetry, by favouring the borrower than the lender; leads to inefficiency in the allocation of funds. The inefficiency causes some good quality projects to remain unfinanced, denied credit or become credit-rationed. The occurrence of credit rationing suggests that there is limitation to monetary policy effectiveness and the financial intermediation (Oyaromade, 2006). A general suggestion from economic theory suggests that reduction in information asymmetry is critical to boosting bank lending. Demirguc-Kunt and Detrigiache (1998) and Nnnana *et al,* (2004) linked banking inefficiency to micro-level variables, which includes information asymmetry. The efficiency of the financial market is reflected by how much it is able to reduce the cost of its products and services. Information asymmetry forms part of the cost component. As a result, fall in information asymmetry is a major attempt at reducing lending prices in the industry. The problem of information asymmetry is more pronounced when there is an absence of competitive credit sharing agencies and participants in the market.

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[36] The other core function of banks is to accept deposits.

Information asymmetry introduces two main problems into the market: adverse selection and moral hazard. In view of the subsisting relationship between economic environment and business returns, reductions in information asymmetry will increase the returns in the financial sector. Inadequate information availability and disclosure have been known to affect asset prices (Easley, Hvidkjaer and O'hara, 2000) and performances. Based on evidences that borrowers strongly depends on banks for their financing[37], increase in information asymmetry will have similar implication as unfavourable economic environment for lending.

The traditional theory of bank lending behaviour as spelt out by Hodgman (1961) explains that the quality of depositor's relationship is the primary consideration for the extension of credit to consumer. Kane and Malkiel (1965), and Wood (1965) had argued that not only do deposit quality matters, but also the impact on the general bank's customers on loan pricing. If the refusal of loan to a loyal customer is costly to the bank, the customer then stands at an advantage to be funded. Banks are mainly concerned about their current actions on future behaviour.

Rather than take the quality of existing relationship as given, we examine the position that bank take to protect themselves when information is asymmetric. The information asymmetry arises because banks are at different sides of the market than the borrower (one on the supply and the other on the demand side). With the presumption of a simple contractual lending relationship that is ameliorable to a typical problem of trust dilemma, incentives from the lending relationship becomes related to information disclosure and/or availability. In view of the fact that lending relationships are dynamic, and may be affected by economic and internal environment of the banks, we assume that banks would prefer their prices to be low enough and fund all customers if they would be committed to reducing risk (by committing high effort) and disclosing all relevant information. With borrowers' heterogeneity, banks will seek to maximize information available about their borrowers' type, and be willing to reduce price for safer borrowers. Information

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[37] See for instance, Gertler and Gilchrist, 1994; Kashyap and Stein, 1994; and Oliner and Rudebusch, 1995.

asymmetry in the lending relationship gives the advantaged party extra gain at the expense of the other party[38]. Hence, an initially profitable transaction between symmetrically informed agents could turn out to be asymmetric if the borrowers decide to divert some part of the fund outside the knowledge of the lender. Since borrowers and lenders rationally anticipate the likelihood of default, lending relationship are drawn to be self-enforcing and as an implicit contract. In this view, Sharpe (1990)[39] employed implicit contract models as theoretical explanation to long-term bank-borrower relationships. The explanation posits that long term relationship arises as a result of asymmetric evolution of information between the bank and its borrowers. As bank lends out, it learns more about its borrower's characteristics than other banks. This information advantage leads to the creation of ex-post monopoly power for the lending bank. The information advantage thereby enable bank to earn economic rent by charging competitive interest rate on its lending since they will not likely be loaned by the outside banks. Borrowers will therefore tend to stay with their banks not because they are competitively treated but because they have been informationally captured. Aside this occurrence, borrowers tends to settle with their banks after using the bank's facility. For such borrowers, settling with the particular bank implies forgoing the price reduction that would have been earned from other banks if one had banked with them. Characterising of lending relationship as an implicit contract between the bank and the borrower will imply a mutual insurance; hedging the borrower from credit constraint and/or interest rate fluctuations, and the bank from default tendencies. The basis of beneficial implicit lending contract relationship between bank and borrowers is built on credibility and reputation. A bank in loan contract is credible if it makes nonbinding promise and adheres to it. By fulfilling such promise, it could possible to attract other banks' high quality customers to themselves. The quality of banking relationship in Nigeria suggests that banking relationship cannot be characterised as an implicit contract. The lending relationship takes both legal and commercial

[38] A sort of zero-sum gain analogy
[39] This was also employed by Fischer (1990), Broecker (1990), Rajan (1992) and von Thadden (2001).

structure, such that reputation and credibility content are factored into the lending contract.

Economic literature has documented two types of information asymmetry in bank lending relationships: bank-advantaged (see Fischer (1990); Sharpe, 1990; and von Thadden, 2001) and borrower-advantaged information asymmetry (e.g., see Bebczuk, 2003). The distinction between the two is defined by the extent to which the advantaged party have more (or better) information than the other. The bank or borrower is advantaged to the extent to which he is informationally empowered than the other party. In borrower-advantaged asymmetry, the bank suffers adverse selection for its inability to distinguish between the borrower types, and projects with heterogeneous risks contents offered to it for funding. Given competitive projects with equal expected returns, bank will prefer the safest, contrary to the borrower's incentive for the riskier, because of the high return. With such situation, a borrower undertaking risky venture will find it suitable to hide the true nature of his project, and exploit the bank's lack of information. Moral hazard occurs from the inability of the bank to foreclose the borrower's incentive. The occurrence of information asymmetry could cause high quality borrowers to stay with their bank (even while being overcharged) not because the bank treats them particularly so well, but because they have been 'informationally captured (Sharpe, 1990, p. 1070). The occurrence of asymmetry against the borrowers occurs through hidden charges. Hidden charges are present when loans are executed without any official document[40] establishing it, or charges are made outside the ones specified in the document.

The occurrence of information asymmetry gives rise to adverse selection and/or moral hazard problems. Adverse selection occurs in a situation when potential borrowers who take up bank loans are high risks. It essentially has to do with the distribution of the borrowers and the characteristics before the loan is made. Moral hazard situation occurs when the borrowers take actions to increase private profit at

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[40] An offer letter is the principal and legal document specifying the terms and condition establishing of any loan from the commercial banks. Where a loan is made without the borrower offered one, the loan is seen as asymmetric.

the expense of the bank or embarks on action which makes the possibility of default more likely. With the nature of occurrence of the two, adverse selection is to known to occur a priori, while moral hazard is a posterior phenomenon. The presence of information asymmetry prevents mutually beneficial transactions from occurring. Adverse selection arises because of the heterogeneity[41] in the borrowers' (banks') characteristics which are not directly observable to the bank (borrower). The distinction between adverse selection and moral hazard is defined by the intensity of information asymmetry in the financial system. In most situations, the occurrence of moral hazard arises out of improper conditioning of the borrowers' repayment incentive through the lending agreement. Generally, the standard loan screening procedures adopted by the banks is expected to be able to fully foreclose the presence of adverse selection. Where this is not achieved, the occurrence of moral hazard is precipitated. Information asymmetry problems cause high risks in the lending pool to want to secure larger loan sizes than they can repay at the exclusion of the safe risks. In order to foreclose information asymmetry problems, collateral requirement is used as key instrument of ensuring high effort commitment. When high effort commitment is made, information asymmetry tends to decline. The degree of moral hazard relates to how difficult it is to induce an agent into high effort (Edelberg, 2004). But collateral requirement as a unique dominant strategy may not be efficient if the value of the collateral surrendered is not capitalized (Bolton and Dewatripont, 2005). Despite the usage of collateral requirement to assuage asymmetric problems, its efficiency has remained unknown in the literature. Collateral requirement is still used by banks as major screening criteria to foreclose loans defaults.

3.4   Methodological Review

A number of methodologies have been used in testing for information asymmetries in the credit market. To test for the prediction error in bank loan commitment and financing agreement, the cumulative prediction error technique as developed by

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[41] This heterogeneity is due to both observables (for example, default risk) and unobservables that generates asymmetric information (see Edelberg, 2004).

Dodd and Warner (1983) have been used (Brown and Warner, 1985, McDonald, 1994). The method requires that banks generate forecasted security returns for each day in the estimation period from which actual returns are subtracted to determine the prediction error (PE). The estimation is made on the returns in the shares (or stocks) of the firm concerned for the period when the bank agrees to sign a loan commitment with it and when it did not sign. The underlying assumption suggests that the firms in question must be registered in the stock market, and that there is a semi-strong form of market efficiency such that new information can be quickly fed into the common stock prices (McDonald, 1994). Since the borrowers considered in this study are not necessarily registered in the stock market, the prediction methodology cannot be used. For studies which attempted to evaluate the likelihood of borrowers being rationed loan in credit market, the logit (e.g. Okerenta and Orebiyi 2005; Rahji and Apata, 2008; and Rahji and Adeoti 2010) and/or probit (e.g. Edelberg, 2004) have been very well used. The logit and probit methods have remained a veritable means of analyzing binary and categorical variables. This methodology was employed to estimate the likelihoods that loans offered were likely to default in view of the presence of some identified default risk variables. The correlation methodology based on Chiappori and Salanie (2000) has been the dominant in the test of information asymmetry in bank lending. The methodology is based on the proposition that a positive relationship exists between the default risk characteristics and loan size demanded by borrowers (Cawley and Philipson, 1999; Chiappori and Salanie, 2000; and Edelberg, 2004). The popular usage of the correlation test methodology hinges on the fact that it does not rely on any specific functional forms, preferences or nature of equilibrium for its validity (Cawley and Philipson, 1999). It is for this reason that this method is chosen as appropriate for this study.

The main problem with the use of the correlation test approach is the extent to which a valid link exists between the variables representing loan size and default incidence. The adoption of the methodology is informed by a direct relationship that exists between the size of loan and default incidence. In theory, risky borrowers would tend

to apply for larger loans than the safe borrowers. The logit and the probit methodologies were used to obtain the likelihood of each of the determining variable for a loan default. Probit and logit models are two of the most widely used members of the family of generalized linear models of binary dependent variables (Hahn and Soyer, 2005). The use of the probit analysis arise from the need to analyze qualitative (dichotomous or polychotomous) dependent variables within a regression framework. By nature, most response variables are usually binary (yes/no), while others are measured ordinally rather than continuously (based on the degree of severity). The use of ordinary least square (OLS) approach is inadequate in this kind of situation as the dependent variable will be discrete (Agresti, 1990 and Collett, 1991). This is the basis for the consideration of alternative estimation techniques, in which the probit and/or logit analyses are found to be appropriate. The probit procedure computes maximum likelihood estimates of the parameters of the probit equation using a modified Newton-Raphson algorithm. For most problems, there is relatively little difference between the probit and logistic regression results from the model. Both distributions are usually symmetric to the value zero. The conventional wisdom on the two methods will be that the choice of a link function is a matter of taste (e.g. see Greene (1997, p. 875), and (Gill, 2001, p. 33))[42]. The beliefs were generally found to be true for the univariate binary response models. The empirical basis of the conclusions suggest that discrimination between the two models is not important when sample size are large enough and/or when certain extreme patterns are not observed in the data used for the analysis. The probit and binary links give differing results only in the case of multivariate binary response models (Hahn and Soyer, 2005).

3.5   Empirical Literature

Demirguc-Kunt and Detrigiache (1998) observed a linkage between information asymmetry and micro-level variables of economic interest from a study of 80

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[42] Similar consensus was held among a number of other authors (e.g. Maddala, 1983; Davidson and MacKinnon, 1993; Long, 1997; Powers and Xie, 2000; Fahrmeir and Tutz, 2001, and Hardin and Hilbe, 2001)

countries. The study found that bank specific characteristics, macroeconomic conditions, legal and institutional indicators, among other factors explain the differences in interest margin and market inefficiencies. The study linked inefficiencies in the financial markets to the micro-level variables, of which information asymmetry is included.

On a broad scale, information asymmetry impacts on financial market efficiency through the effect on loan relationships, interest rate price and availability of future loans. Sharpe (1990) argued that firms with existing relationships were likely to suffer higher loan rates because they may have been informationally captured. Kane and Malkiel (1965); Diamond (1989), and Boot and Thakor (1994) however suggested the contrary by suggesting that existing relationships lower loan rates for the older borrowers than for new applicants. Greenbaum, Kanatas, and Venezia (1989); Petersen and Rajan (1994) find a weak evidence that existing relationship would help reduce loan rates, while Berger and Udell (1995), and Blackwell and winters (1997) find evidence of an inverse relationship between bank-borrower relationships and the loan rate. Borrowing constraints and credit rationing arise observed as consequences of information is asymmetry (Clementi and Hopenhayn, 2006; Biais *at al*, 2010)).

The results of studies in vehicles and insurance markets have been mixed. For example, while Bond (1982) finds no evidence of asymmetric information in the used truck market[43]; suggesting that the information problem is probably solved by warranties and costly collection of vehicle history, Genesove (1993) finds weak evidence of adverse selection in the wholesale used car market. In loan markets, Edelberg (2004) found evidence of adverse selection, with borrowers self-selecting into contracts with varying interest rates and collateral requirements. This contrasted with Dobbie and Skiba (2012) who found no evidence of moral hazard in the payday loan market. The study suggested further that increase in loan sizes will lower the probability that borrowers will default. In insurance market, there seem to be mixed

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[43] In this case, the bad does not drive out the good.

consensus on the presence of information asymmetry. Cutler and Zeckhauser (1998); Finkelstein and Poterba (2004); Finkelstein and McGarry (2006), and Olivella and Vera-Hernandez (2013) found evidence of adverse selection in health insurance, long-term care insurance, annuity markets and private health insurance. However, Cawley and Philipson (1997); Chaippori and Salanie (2000), and Cardon and Hendel (2001) do not find evidence of information asymmetry in a sample of insurance contracts. Within the African financial markets, empirical validation of the presence of information asymmetry has been lacking. This is more important in view of the fact that most of the countries do not have well-developed credit infrastructure such as credit bureaus, credit rating agencies, or large number of highly skilled credit risk analysts.

In terms of the nature of equilibrium in the markets, results on the types and impacts of information asymmetry are also mixed. Blackwell and Santomero (1977), Peter (1980) and Stiglitz and Weiss (1981) showed that credit rationing characterises equilibrium in the loan markets. Bester (1987) observed that such equilibrium does occur only if the borrowers' collaterizable wealth is small enough to allow perfect sorting or to create sufficiently strong incentives for borrowers to charge the maximum amount of collateral in equilibrium. Such (1985); Chan, Greenbaum, and Thakor (1986); Boot, Thakor and, Udell (1988), including Boot and Thakor (1989) observed that in multi-period contracting, credit rationing can help to sort out bad and good borrower types. Their finding was suggestive of a separating equilibrium. Sharpe (1990) observed, solving an implicit contract game, that the resulting equilibrium has a pure strategy. But von Thadden (2001), using similar models as Sharpe obtained mixed strategy equilibrium. Rajan (1992), building on Fischer-Sharpe model also observed a mixed-strategy possibility in a situation which is similar to that of Sharpe (1990). These empirical evidences imply that the explanations of information asymmetry in the credit markets have not been settled. While Ogun and Ofonyelu (2012), and Ofonyelu and Alimi (2013) have provided some empirical insight to support the existence of information asymmetry in Nigerian banks, this study differs by investigating the size and impact of the

presence on lending efficiency. The study builds on the frameworks of Chiappori and Salanie (2000), and Edelberg (2004) which lay out the theory for a similar model in insurance and consumer loan market to explain the presence of information asymmetry in Nigeria's commercial banks loan market. The study characterizes the nature of the subsisting equilibrium in the market using a game theory approach.

CHAPTER FOUR

THEORETICAL FRAMEWORK

4.1   Introduction

This section presents the framework of the Study. The theory of relationship banking as proposed by Boot (2000) provided the framework for this study. The study discusses lending as a dynamic bilateral contract between a bank and its borrower(s) using two frameworks of analysis. The first framework is based on Chiappori and Salanie (2000) Statistics, and the second on a game theoretic approach. The Chiappori-Salanie Statistics gives the conditional situation with which information asymmetry can be said to exist. The game theory specifies the condition within which equilibrium exist in the market. The rest of the chapter is sectioned as follows. In section 4.2, we articulate an optimal contract with imperfect information. Section 4.3 characterizes the role of effort commitment in the effective repayment of a loan. The discussions draw out the testable propositions.

4.2   Optimal Contract with Imperfect Information

We characterize a lending contract drawn by a bank to borrowers who are asymmetric about their personal characteristics to the bank. For the sake of simplicity, we assumed the banks as the sole source of funding in the loan market. In addition, we assume the borrowers are the only source of asymmetry[44]. The loan contract considered is a two-period phenomenon; the customer obtains the loan in the first period and pays back the principal with interest in the second period. Adverse selection and/or moral hazard arise from either the characteristics of the project being financed or that of the borrower loaned. In the first period, the bank playing first advances to the borrower a fixed amount of money for a specific

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[44] This analogy is also valid if the bank is the source of asymmetry by attempting to introduce hidden charges to the borrower.

purpose[45]. The loan is to be repaid in the second period[46] as the principal with interest or the pledged collateral will be forfeited in the case of default. All loan considered are assumed to be fully collateralized, and that the value of the collateral is able to offset the value of the loan in the case of default. From the bank's perspective, default occurs from either of these two situations: the borrower does not make sufficient profits to repay the loan, or he is not committed to exerting commensurable effort level that will ensure repayment. The second likelihood precludes that the borrower is capable of repaying but chooses to default. While the first scenario is undesirable for either of the parties, the occurrences of the second scenario arise from moral hazard, and this the bank intends to foreclose by committing the borrower to high effort. The effort variable relates positively with the bank's utility function but indirectly with the borrowers'. Adequate securitization ensures that loans advanced are recoverable in the latter circumstance. The crux of the study is on the decision course made in period two. The optimal loan contract is specified to satisfy the two-period reservation utility[47] of the borrowers by assuming that all viable projects will be funded. Given such situation, the expected utility of consumer i in the period 2 when the loan is due for repayment can be represented as:

$$E(U_i) = B[(1 - Л(e_i))u(s_i) + Л(e_i)u(f_i) - d_i e_i] \qquad (4.1)$$

$$s_i = W + Y - R_i \text{ and } f_i = W - k_i$$

where u is increasing and strictly concave. W is the wealth which will be exempt in the case of default; k is the collateral pledged out of the exempt wealth. $Л_i$ is the probability of default for individual i, and is related to effort e. Equation (4.1) implies that the payoffs of each borrower is defined by the composition of the riskiness of the project and the wealth level. $e = \{0, 1\}$[48], such that mid-point values are excluded. With probability $(1 - Л)$, the borrower makes income Y and pay back B with the returns, R. d_i is the cost of effort, and is assumed to be variable, linear and

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[45] The loan refer to those that are used to increase existing capital stock, otherwise referred to as investment loans.

[46] The whole period of repayment inflows is summarily referred as the second period. This is irrespective of the duration of repayment.

[47] Including reservation utility as a constraint in period one do not change the implication of the model; it only reduces the set of possible contracts (see Edelberg, 2004, p. 7).

[48] We assume that effort is discontinuous such that $e'(\infty) = 0$

separable with respect to each investment. The loan contract is assumed to be complete[49] and characterised by total repayment (including interest and principal), such that $x_i = (k_i, R)$ offers financing with collateral k_i and return R_i. When effort is very high, that is $e_i=1$, default likelihood becomes unlikely, such that $Л_i=G_i$. But when effort commitment is low, such that $e_i=0$, default become more likely such that $Л_i=N_i$. Mainly, high effort implies a higher chance of repayment, while lower effort implies otherwise. Lenders are assumed to be risk neutral and maximize the expected payoff from the contract. As a result, non-zero profit condition[50] for contract x_i becomes

$$(1- Л_i(e_i)) R_i + Л_i(e_i)k_i – B > 0 \qquad\qquad (4.2)$$

Where B is the value of the loan (including all other costs to the bank). It is assumed that banks cover these costs, at least on the average, such that the costs of fund do not vary with the banks' portfolios. Equation (4.2) implies that there is a positive gain from the loan which is less than the value of the pledged collateral. When there is asymmetric information, both effort and default probability are related to the type of contract issued (denoted as $Л_i(x_i)$), such that inability of the bank to contract on appropriate effort level will lead to moral hazard. It now behoves on the bank to condition the borrower's effort level (via collateral requirement) to ensure payment. Effort-based contracts that depend on observable and verifiable characteristics, which if properly conditioned, create incentive for the borrower to act in the bank's interest as in when the contract is optimal. The extent to which inducing high effort will be profitable to the agents depends on G_i-N_i, which essentially measures the effectiveness of high effort (Edelberg, 2004). We assume that ex-post state of gain from effort can be observed by both the bank and the borrower and that there is a limit to which profit obtained from investment, Y can be misreported[51]. The bank suffers from information asymmetry by being unable to distinguish between

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[49] It specifies the legal consequences of all the possible states.

[50] Because most borrowers are subject to being informationally captured (Sharpe, 1990), lenders could make positive profit while borrowers' utility are still being maximized.

[51] The borrower does not have the power to deceive the bank when actual return from the investment is positive.

borrowers of types[52] as well as their projects. With such situation, issuing a menu of contracts that allow borrowers to sort themselves and reveal their types becomes profitable, while risks are endogenized to the model.

If we assume a two-state world, such that a loan could either succeed or fail totally (excluding the possibilities of partially successful loans), when $Y > R$, the loan is repaid in full. Otherwise, $Y=0$, and the lender will receive only the value of the collateral. Further, if claims on the exempt wealth are limited to the wealth and collateral pledged only, all the borrowers will have similar utility function, wealth and potential for the successful realization of the investment in an optimal contract.

4.2.1   Moral Hazard

Moral hazard occurs in optimal contracts if the bank cannot condition their borrowers to the rightful effort level that will ensure that their ex-post unobservable private characteristics are same ex-ante. The ex-ante private actions are those actions which are known by the bank and had been conditioned before the disbursement of loan. The ex-post actions are unpredictable and come to be known after the loan has been disbursed. Because of information asymmetry, the unobservable ex-post actions cannot be conditioned and as a result the bank is exposed to moral hazard. To overcome this problem, the banks set their contract to induce borrowers to commit high effort which reduces the likelihood of default. For the borrower, the degenerative of information asymmetry will be for him to ensure that all charges on the loan are well spelt out before the loan is initiated. For the bank, the incentive compatibility constraint (ICC) specifies that:

$$(1 - G_i)u(s_i) + G_iu(f_i) - d_i \geq (1 - N_i)u(s_i) + N_iu(f_i) \qquad (4.3)$$

Equation (4.3) implies that the reward to effort is strictly positive. Thus, should the borrower commit no effort (and defaults), the value of the wealth and collateral that will be foreclosed are higher than the expected value of the loan. By simplifying further, (4.3) implies that,

$$u(s_i) - u(f_i) \geq \frac{di}{Ni - Gi} = \epsilon_i \qquad (4.4)$$

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[52] We designate 1 and 2 to refer to the low and high risk borrowers respectively.

Equation (4.4) implies that the utility from making investment should be greater than the incentive to shirk from taking effort. Equation (4.4) specifies the non-shirking condition (for the borrower). By implication, ϵ_i must be positive, such that

$$u(W+Y-R_i) - u(W-k_i) = \epsilon_i \qquad (4.5)$$

Equation (4.5) measures the extent to which borrowers are interested in taking up new loans. Once ϵ_i is positive, then there is reward for making effort to succeed with the loan. The essence of the ICC is to link default incentive with the effort level. From it, the bank guarantees from the onset that its investment will be profitable. To preclude moral hazard, equation (4.1) is modified to penalize default incentive.

$$E(U_i) = B[(1- Л(e_i))u(v_i) + Л(e_i)u(f_i)-d_ie_i] \qquad (4.6)$$

$$\text{where } v_i=W+Y-(R_i+\gamma) \text{ and } f_i= W-k_i$$

γ refer to the penalty cost introduced by the bank to deter default, and serves to compensate the bank borrower if he increased effort in order not to default. Equation (4.6) increases the incentive to repay for the safe borrowers (since they will not be required to pay γ), but increases the risk for the risky borrowers. The penalty is expected to relate indirectly with e. One impact of the penalty charge is that in a situation where default is inevitable, huge accumulation of penalty costs over time could overrun the value of the loan as well as the collateral. In such situation, liquidating the collateral may become insufficient to recover the debt. If γ is positively correlated with Л, the introduction of the penalty cost becomes undesirable[53]. Otherwise, the bank may have to negotiate for a cut-off value to be paid in place of the full value of the loan in the event of default.

4.2.2 Adverse Selection

Adverse selection arises in a situation where lenders cannot distinguish between their borrower types. Type 1 and type 2 borrowers are used to refer to the safe and risky types of borrowers. The lending contract is specified to fulfill a revelation constraint such that each category of borrowers will sort themselves into contracts revealing their risk types.

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[53] Borrowers with high W may be able to influence collaterized debt obligation by securing court injunction to forestall seizure of asset by the bank.

$$u(s_1) + \pi(x_1)(u(f_1) - u(s_1)) \geq u(s_2) + \pi(x_2)(u(f_2) - u(s_2)) - d_1(e_1(x_2) - e_1(x_1)) \quad (4.7)$$

Where π and e are related to the contract choice offered. Equation (4.7) implies that borrowers optimally sort themselves into contracts to reveal their risk types. This will lead to the typical scenario of separating equilibrium with adverse selection and no moral hazard (in figure 1) as the revelation constraint will be more binding for the riskier (type 2) than for the safe borrowers (type 1)[54]. Moral hazard ceases because the tendency by the borrower to take undue risk after the loan is granted is already conditioned by the increased effort incentive arising from the separated contract types. The responsibility of ensuring that the loan succeeds becomes shared by both the bank and their borrowers as their payoffs become tied to the success of the loan. The borrower pays only R without γ while trying to maximize Y and W, while the bank maximizes equation (4.2). The incentive to maximize Y preclude that default will occur. We attribute adverse selection to the situation where the loan increase with loan size and default only, compared with moral situation where amount spent outside the project also rises.

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[54] For further clarification on this type of equilibrium, see Edelberg (2004; page 11).

Figure 4.1: Adverse Selection with No Moral Hazard
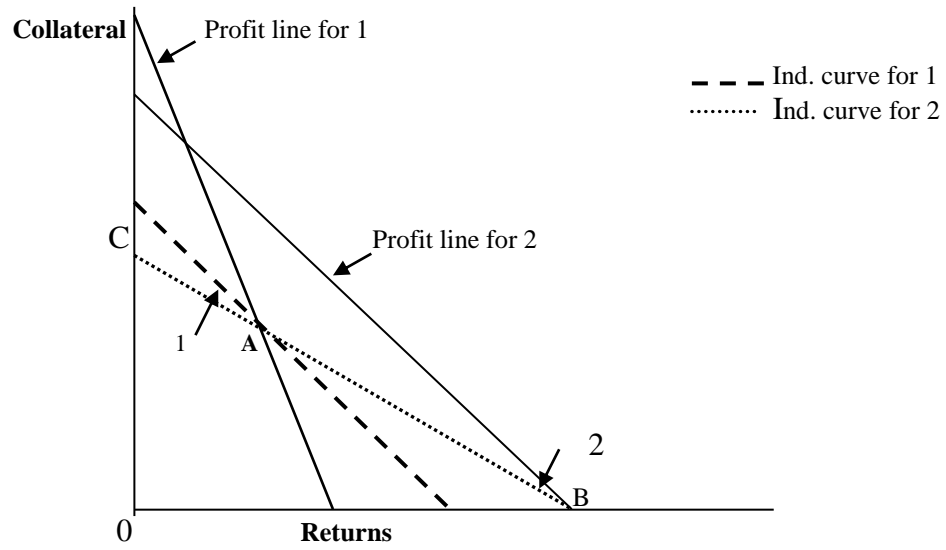
Source: Adapted from Edelberg (2004; p. 40)

Figure 4.1 shows the typical example of adverse selection occurring but without moral hazard. We notice that the higher risk borrower has a flatter indifference curve. The figure showed the revelation constraint being more binding for the riskier (type 2) than for the safe borrowers (type 1). The indifference curve of the type 2 borrowers tilted more towards the returns than the collateral axis. The implication of this is that risky borrowers value their collateral less than the safe borrowers and as a result may be adversely selected. But because of the optimal contract design, at equilibrium point A, type 2 borrowers have higher value of their collateral at stake with respect to the returns to be earned. The larger the value of collateral to the return accruable, the more moral hazard is foreclosed. The profit line for the safe borrower showed their curve tilting highly towards the collateral axis, and that of the risky borrowers tilting towards the return axis because of their preference for the two. Essentially, a risky investment will be compensated with higher return as in the case for the type 2 borrower than for a safe borrower.

Figure 4.2 shows the ICC and the zero-profit lines for two borrowers with different π's and θ's. It shows the case where $\theta_1 > \theta_2$. In essence, borrower 1 is more difficult to induce into high effort than borrower 2 because of the value they place on collateral requirement. We note that the zero-profit lines become flatter as they cross the ICC frontier, as effort goes from 1 to 0. The figure shows an adverse selection situation with moral hazard. Compared to figure 4.1, figure 4.2 also showed the revelation constraint being more binding for the riskier (type 2) than for the safe borrowers (type 1). With the presence of moral hazard, there was a sharp outward shift to the right, with the intensity being more for the risky than the safe borrowers. The moral hazard caused the zero profit lines to kink outward; signifying increased returns for both borrower types respectively. The main implication of the moral hazard is on the ϵ_i. ϵ_i becomes strictly positive and increasing in response to the returns incentive. The binding constraint is the disincentive to commit moral hazard. The flatter indifference curve of borrower 2 implies that riskier borrowers face lower marginal utility for more loans at the equilibrium.

Figure 4.2: Adverse Selection with Moral Hazard

Collateral

profit line 1 ε_1

C ε_2

profit line 2

0   B

Returns

Source: Adapted from Edelberg (2004; p. 40)

Ind. curve for 1

Ind. curve for 2
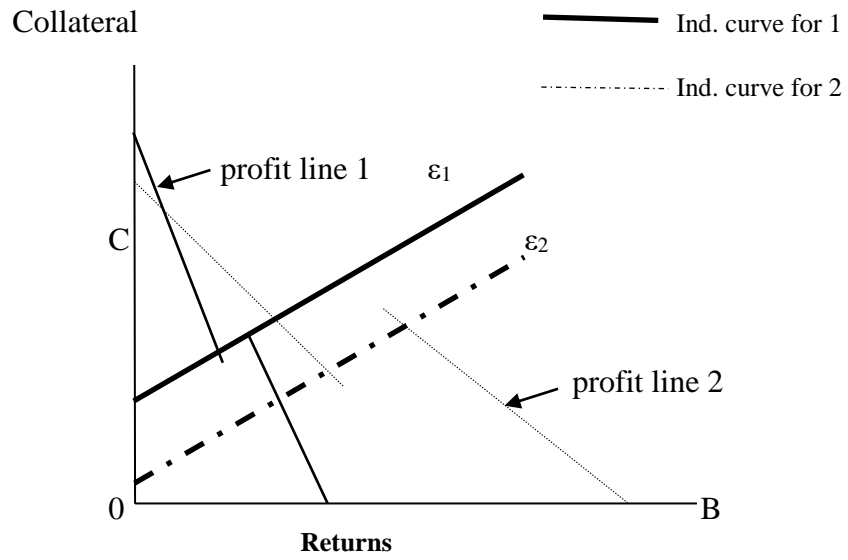
Figure 4.1 shows that the revelation constraint is more binding for the riskier borrower than for the safe borrowers. With adverse selection and moral hazard, the marginal utility for both borrowers will be positive, such that there will be a direct correlation between borrowers' loan demand and default risk. An increase in interest rate will raise the marginal utility for type 2 borrowers such that equation (4.6) becomes

$$u(s_1) + (\pi(x_1(R_1,k_1)(u(f_1)- u(s_1)) < u(s_2) + \pi(x_2(R_2,k_2))(u(f_2)- u(k_2)) \qquad (4.8)$$

With the increased concentration of high risks in the pool, it is no longer optimal for the bank to increase the lending rate to cover higher default risk, and thus leaving few type 1 borrowers in the pool. Thus, interest rate, default risk and information distribution becomes endogenous to the repayment likelihood. Compared to figure 4.1, adverse selection with moral hazard will cause the zero profit line to tilt further from each other, widening the profit gaps between the two set of borrowers for same project. Such scenario accounts for the single crossing equilibrium in most lending market.

4.3 Optimal Contract with Effort Commitment

This section explores the possibility and implications of using collateral requirement to commit borrowers to repayment. In designing a lending contract (e.g., an offer letter), banks set their loan contracts to satisfy the effort incentive constraints of the borrowers in order to reduce default probability. The effort function, e(.) relates positively with the value of the collateral (k) used to secure the loan, penalty chargeable in the case of default[55] (p), as well as other commitments(z) that may become binding upon the approval of the loan. Effort relates directly with k, and indirectly with p and z respectively.

$$e = e(k,p,z) \qquad (4.9)$$

The penalty charge applies when the borrower fails to make appropriate payment when it falls due. This is charged to only the effective debit balance that has fallen due. Since effort is strongly related to k, equation (4.9) reduces to (4.10) when

[55] The default referred to here is not the total default but the partial default which may arise as a result of untimely remittance of an instalment payment which had fallen due.

collateral requirement is the only variable that can be contracted upon by the bank. Subsequently, equation (4.7) can be modified to (4.8) as

$$e = e(k) \tag{4.10}$$

$$e = Л_i(e_i)k_i \tag{4.11}$$

By ensuring that borrowers commit high effort (e_h) on their investment, default probability is reduced. Since collateral surrendered[56] can be monitored (and/or conditioned) by the bank, information asymmetry would be reduced when borrowers are bonded by a revelation constraint that is based on high effort commitment. Typically, the expectation is that the low risk borrowers would be the one that would be willing to commit higher effort ($e_l > e_h$) as a certainty of their repayment probability. In most instances, the low risks may however be unwilling to pay higher interest rate. Banks' expected profit (utility) is dependent on default risk and the interest rate charged. While interest rate and returns are directly related to the bank's profit, default probability relate inversely with returns. We set out to examine if lending would be efficient when high effort is committed and there is the presence of moral hazard and/or including adverse selection. Essentially, we test the proposition that default risk is inversely related to the amount that is being pledged as collateral. This presupposes that those who surrendered large collateral security would repay their loans.

$$Л_i = b_0 - b_1 k \tag{4.12}$$

Equation (4.12) is the theoretical model showing the indirect relationship between default risk ($Л_i$) and collateral/effort commitment, k. Given the foregoing discussion, the testable propositions in the occurrence of adverse selection and/or moral hazard emerge as follows:

(a) default risks will increase with the loan size

(b) the loan size will relate inversely with effort commitment

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[56] Especially the collateral security, a borrower forfeits such an asset in the case of default. We assume that the value of collateral surrendered is large enough to offset defaults that could arise, and that its value is in all cases strictly greater than the accumulated debit balance. An institutional system that ensures perfect enforcement of contract is also assumed.

(c) All viable loans/projects may not be funded despite availability of idle funds (i.e. lending will be inefficient)

The first proposition is the general condition for the presence of information asymmetry. Borrowers with larger loans have more incentive to default than lower-sized borrowers. The second proposition suggests that borrower's effort commitment would increase with the loan sizes. For a borrower who secures large loan size, greater effort (in term of collateral security) is expected than that required from a low-sized borrower. Otherwise, the incentive compatibility constraint is violated. The third established the link between information asymmetry and lending efficiency. The main impact of information asymmetry in the process of financial intermediation is to cause a wedge between the deficit and surplus agents in the financial market. Information asymmetry is behind the occurrence of most banking disequilibrium.

CHAPTER FIVE

METHODOLOGY

5.1   Introduction

This section gives a description of the research design, method and instruments employed in the study. It covers the research, sampling design and how variables used were measured. In addition, it comprises measurement of variables, data collection methods, processing and analytical approach used in the study. Data obtained from the questionnaires constitute the primary data used. The secondary data used to characterise the presence of information asymmetry were obtained from the Annual Reports and statements of Accounts of CBN and NDIC. The study employed econometric and game theory models as test approaches.

5.2   Data Collection

The data used for the study was primarily sourced. The data was obtained from the use of questionnaire and interviews with the focus group and examination of some vital documents relating to the banks. The sample frame comprised borrowers who had used bank loan(s) or still hold loan(s) with banks. The loans considered were made between 2000 and 2012. Borrowers were required to provide responses to a set of 70 structured questions about their experiences on loan transaction(s) they had with their bank (see the questionnaire as in appendix E). The survey focused on the demand side of the credit market (the borrowers). This was because it is very difficult getting information from the banks as suppliers of funds. Banks are required to keep as confidential the details of their customers except where it is required by law for it to be reported. In the survey, 15 banks across 12 states of the federation were selected. Lagos, Kano and Anambra had the highest concentration of banks in Nigeria. In view of this, each of them was included in the selection under the respective geo-political regions. Kano State (from the north-west), Kogi State and Abuja (from the north-central), and Adamawa State (from the north-east) represented the three northern regions. For the other three regions in the south, Anambra, Enugu and Ebonyi represented the south-eastern States; Delta and Edo represented the

south-south; while Lagos, Ondo, Ogun and Oyo represented the south-western region. In each of the States representing the geo-political zones, at least one new and old generation banks was sampled. The largest responses came from Anambra, Lagos and Ondo states of Nigeria. Lagos and Anambra represent two of the commercial cities in Nigeria with very high concentration of commercial banks. Large response from Ondo State is as a result of the author's familiarity with the environment. Fundamentally, obtaining reliable information for this kind of study has to do with the level of familiarity of the researcher with the respondents. It was observed in the study that familiarity was a major factor that motivated many respondents to participate in the sample group. A number of respondents viewed some of the questions as too private to be divulged for external consumption. Thus, they could only respond to the questionnaire when they are in no doubt of the purpose of the questioner. The distribution of the respondents reflects the availability of those who were willing to give the required information. The information gathered was judged adequate to pursue the objectives of this study.

The north eastern region was majorly inaccessible because of the security challenge in the area in the period of the study. Each of the states selected to represent the respective regions were chosen based on banks' concentration and accessibility to the target group. The survey period spanned from August, 2011 to March 2012. The sample choice of the 15 banks was based on two grounds. First, based on the existing structure of banks in Nigeria, the choice of the banks captured presents a good representation of both the old and new generation banks. Second, the banks constitute those with which the customers made themselves available to be sampled. It was difficult stratifying the respondents to include equal members in all of the states and banks involved[57]. The banks were virtually unwilling in disclosing the details of their customers. Mostly, only responses from willing respondents across the states of the federation were used in the study. Information on the lending criteria of banks obtained was mainly from the ex-bankers. This was because of the

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[57] For instance, some information are classified as exclusively internal to the banks (e.g. the actual bad debts of the banks), since its revelation could precipitate bank crisis (runs).

difficulty in securing reliable information from on-the-job bankers who were bound to uphold the secrecy of their customers. These challenges in part raised the chances of selection bias in the study.

Table 5.1 showed that majority (71%) of the respondents were from the three States of Lagos, Anambra and Ondo. The microfinance banks considered were from the two States of Anambra and Ondo State. The Inclusion of the respondents of the financial outlet was because many of such borrowers also used the mainstream financial institution. The difference between the two is that lending requirement of the microfinance banks was more flexible. Of the loans considered, 39% were used to boost the working capital, 38% was used to expand existing business, 15.24% was used to initiate new business while 7.62 was used for some other purposes. Based on the general experience of lending in Nigeria, banks do not like to lend for new investments. 39% of the borrowers confessed to have hidden some vital information required of them from the bank. 40.95% of the loans disbursed were not repaid. Of the borrowers, 26% confessed to have taken private actions which culminated to the failure of the loan. Majority of the borrowers (56%) rated the bank interest rate as being too high. Were the borrowers to be given new loans again, 39% will not be willing to accept it the loan again. The descriptions of the responses from the questionnaires are summarised in the tables below. Table 6.1 present some vital details about the characteristics of the borrowers. Essentially, the table shows that both from the side of the borrower and the bank, there are evidences of hidden information and information asymmetry. Information asymmetry was observed to be generally prevalent in the banking industry as revealed by the responses presented in the table.

Table 5.1: Towns Covered by the Questionnaire in the Captured States

States	No of Respondents	No of Towns/ Areas Covered	Branch(es)
Abuja	2	1	Suleja (First Bank)
Anambra	52	12	Agulu (Microfinance), Ugbenu (microfinance), Amanuke (microfinance), Awba-Ofemili (Ndiolu microfinance), Ekuluobia(microfinance), Abagana (Firstbank), Awka(FCMB, Ecobank, Unionbank, Zenith bank, Enterprise bank), Urum (Firstbank, Union bank), Isuofia (Microfinance), Onitsha(Diamond bank, Firstbank), Nnewi (Access bank), Nkpor (Firstbank, microfinance)
Delta	6	2	Agbor (Firstbank), Warri (Stanbic IBTC),
Ebonyi	2	1	Firstbank (Afikpo)
Edo	8	3	Akpakpava (UBA, Wema), Mission Road (UBA), Sapele Road (GTbank)
Enugu	4	2	Enugu (microfinance, Zenith)
Kogi	2	2	Firstbank (Okene), UBA (Lokoja)
Kano	12	2	Firstbank (Sabon Gari), UBA (Kano)
Lagos	58	6	Lagos Island (Accessbank), Maryland (Accessbank), Victoria Island (Skyebank, GTbank,), Odogunyan(FCMB), Ikorodu (GTbank,Accessbank, Firstbank,Wema), Ojuelegba(Zenith)
Adamawa	4	1	Mubi (Firstbank)
Ondo	40	4	Ikare, Akure (Firstbank,Enterprise,Ecobank, Keystone), Ore(Firstbank), Akungba:Oroke Microfinance bank
Ogun	10	3	Otta (GTbank) , Ijebu-ode (First Bank), Abeokuta (Zenith)
Oyo	10	2	Bodija(Keystone bank), Iwo Road (UBA, Keystone bank)
Total	210	39	15 (commercial banks), 11(microfinance banks)

Source: Author's Field Survey

In effect, 210 questionnaires were used from a total of 223 filled and returned. Respondents included extended family members, church associates, friends and associates of friends, businessmen, market traders and others who belong to the target group. 41 undergraduate students[58] assisted in administering 64 of the questionnaires to their parents, relatives, and guardian after they certified that they fitted into the sample category in parts of Lagos, Ondo, Oyo, Abuja, Delta and Ogun states. A total of 65 returned questionnaires came from Awka, Onitsha and Nnewi parts of Anambra state. 45 were administered within Ikare, Akungba and other parts of Akoko in Ondo state where the author resides. In all, 15 commercial banks and 11 microfinance banks were captured. Since banks operate similar lending policies across their national branches, the size of the respondents sampled presents a good representation of the borrowers' lending performance in the banking system.

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[58] From Adekunle Ajasin University, Akungba Akoko

5.3   Survey Instrument and Sample Design

The main survey instrument used for the study is questionnaire. The questionnaires used contained 70 questions, bordering on the features that are used in the pricing of bank loans; loan-collateral ratio, duration, lending rate, collateral requirement, amount diverted, purpose and structure of the loan. It also contained questions on the perspectives of the borrowers concerning the effectiveness of the banks' loan screening criteria, collateral requirement and the general lending conditions. The questions were drawn based on the underlying theory explaining loan default and bank lending relationship. The microfinance participants were included to expand the sample size. The sampling frame supposes all bank borrowers who had used bank loans or currently using a bank loan. A multi-stage, but purposive sampling approach was adopted. Each banks identified in term of the geographical region they belong, and the concentration of banks in such state. Unlike random studies, which deliberately include a diverse cross section of ages, backgrounds and cultures, the idea behind purposive sampling is to concentrate on people with particular experience on bank loan that will better be able to assist with the relevant research. The main intent of the purposive sampling is getting workable data from the general population. Were a sample of all banking populace to be surveyed, there would include a large number of the sampled who would be unable to relate relevant information to the study as they had never used a bank loan. It is for this reason that the focus is strictly on those who had used bank loan. One of the key benefits of this sampling method is the ability to gather large amounts of information by using a range of different techniques. The variety in turn gives a better cross-section of information than were a simple random approach used. The sampling was carried out based on the concentration of banks across the federation and availability of willing respondents who must have been a bank customer and had used bank loan to finance an investment. The States were chosen to spread through the various geographical regions of the federation. The three States of Lagos, Anambra and Kano were chosen because of the high concentration of banks they posses. Lagos is from the south-west; Anambra is from the south-east and Kano is from the north-east respectively.

In all, 256 questionnaires were administered of which 223 were filled and returned but only 210 was used. The responses obtained gave a cross-sectional data; the characteristics of loans across 70 borrowers. The size of 210 was considered sufficient considering the fact that bank lending procedures across the banks differs only slightly. Given the fact that the actual population of all who had used (and/or currently holding bank facility) cannot be ascertain, the use of sampling formula[59] to decide a particular optimal size for this kind of research therefore cannot be applicable. Tables 5.2 (a) and (b) showed the margin of errors expected when different sample sizes are chosen. Based on the table 5.2 (a), there is 5% chance of the sample results differing from the true population average. However, when compared with table 5.2(b), the result suggests that the sample error will be between 4.5% and 7.1%. Representative sample essentially has more to do with including the right people in your population of interest into the sample space than with the right sample size. It is for this reason that the test for reliability and validity of the questionnaire is important.

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[59] Sample size (SS) using the formula can be calculated as $ss = \frac{Z^2(p)(1-p)}{c^2}$ where Z = Z value (e.g. 1.96 for 95% confidence level), p = percentage picking a choice, expressed as decimal, (0.5 used for sample size needed), c = confidence interval, expressed as decimal (e.g., .04 = ±4)

Table 5.2(a): Rating Scales for optimal sample size

Margin of Error (+/-)	Rating Scale Sample Size	Binary Sample Size
1%	6073	9600
3%	686	1064
5%	249	381
10%	64	93
15%	30	39
20%	18	21

Source: Suaro (2010)

Table 5.2(b): Rating Scales for optimal sample size

Sample Size (N)	Margin of Error (fraction)	Margin of Error (percentage)
10	0.316	31.6
20	0.224	22.4
50	0.141	14.1
100	0.1	10
200	0.071	7.1
500	0.045	4.5
1000	0.032	3.2
2000	0.022	2.2
5000	0.014	1.4
10000	0.01	1

Source: Nile (2006)

5.4   Reliability and Validity of Measurement

Validity and reliability test are two important tests in behavioural studies that are carried out to know the extent to which data collected is correct. The evaluation is important in order to ascertain measurement errors that may be associated with the way that a study is carried out. Reliability and validity tests are useful to indicate the extent to which errors may be present in the instrument of data collection, which in this study is the questionnaire. By reliability test, the precision power of the questionnaire is tested. That is, how far the questionnaire consistently measures what it set out to measure. What the questionnaire set out to measure in the study is the extent of asymmetry in bank-borrower lending relationship. For an instrument to be reliable, it must control for the occurrence of random error in the measure. Measurement errors occur when actual respondents' attributes differ from the survey outcome. Low reliability indicates that the score produced by the instrument, which represents the characteristic being measured (such as attitude, response or reactions), may fluctuate greatly if we use the questionnaire again with the same group of individuals. In order to test for the reliability of the instrument used, a copy of the questionnaire was administered to five respondents in the pilot stage of the study twice within a two-week interval. After this, the two sets of responses were compared for those questions for which the same responses have been provided with those for which the responses differ. The ratio for each of the respondents was taken and the average taken to arrive at a coefficient for the reliability. The result obtained showed on the average that 72.6% of the responses were same. The rule of the thumb is that higher association value (usually of above 70%) indicates that the instrument used was reliable.

The test for validity addresses the existence of systematic or built-in errors that may be present in the measurement (Norland, 1990). Conducting a content validity test on a questionnaire implies measuring the degree to which the content of a subject matter measured reflect the domain of interest. It essentially measures whether the instrument used for a study measures what we say the study is about (Miller, 2003). The Content Validity Index (CVI) measures the validity of a research instrument

using ranked scale[60] of measurement to arrive at a coefficient. Validity test essentially assures that we are measuring what we have planned to measure, and to know the extent to which the test item reflect the knowledge actually required for the given topic area. The method adopted for the study is a modification to that suggested by Lawshe (1975). Lawshe (1975) required that a panel of judges/experts on the subject matter respond to all questions in the said questionnaire (instrument) using a four-point rank scale of 'essential (E),' 'useful (U), not essential (NE),' or 'not necessary (NN)'. In view of this, five questionnaires were administered to five-member panel, hereby referred to as the panellist in the pilot stage of the study, and were required each to rank all the questions in the questionnaires based on the four-point rank scale of 'essential,' 'useful, not essential,' or 'not necessary' as suggested by Lawshe. Included in the panel are 4 senior lecturers, 1 ex-banker (left the industry as head of branch operations). According to Lawshe, if more than half of the panellists indicate that an item is essential, then the item has at least some content validity. Greater levels of content validity exist as larger numbers of panellists agree that a particular question is essential. The coefficient for the content validity ratio (CVR) is measured as $(n_e - N/2)/(N/2)$, where n_e = number of members of the panellist indicating that the questionnaire is essential, and N = total number of the panellist. The formula yields value which range from +1 to -1. A positive value indicates that at least half of the panellists rate the questionnaire as essential. The mean CVR across items may be used as an indicator of overall test content. For the study, the average mean response across the questions for the five member panel was 0.034 (see table B-1 in the appendix).

5.5   Testing of Adverse Selection and Moral Hazard

One common problem in testing contract-theoretic models of asymmetric information is that the models involve actions that are typically not easily observable (Cardon and Hendel (2001)). In view of this, the study examined the borrowers'

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[60] The ranking measures whether the knowledge measured by the instrument is 'relevant', 'quite relevant', 'somewhat relevant' and 'not relevant'. The four-scale ranking points have been the most popular.

behaviour over the lending relationship with banks as proposed by Boot (2000). The borrowers were sorted into different loan sizes based on the amount of loan sought from the bank. In the experiment that follows, borrowers were categorized into risk groups such that moral hazard can be separated from adverse selection depending on the extent to which ex-post characteristics of each individual differs from that of the others. Loan sizes, amount of money misspent, loan-collateral ratio, duration and lending rate were used as explanatory variables determining the default likelihood of borrowers on loans. This test approach suggests that borrowers are the source of information asymmetry with little recourse to the actions of the bank in instigating default. From the perspective of the borrowers, banks could also be the source of asymmetry. For instance, when unauthorised charges are debited to borrowers without their pre-information, information asymmetry is presumed to have occurred. In either of the perspectives, information asymmetry is defined to exist when there is inequality in information possession between banks and the borrowers. Following Edelberg (2004), Chiappori-Salanie positive test methodology was used to test for the presence of information asymmetry. The theoretical details of the test statistics is given in the succeeding subsection.

5.5.1   The Positive Correlation Test

The theoretical idea of the positive correlation test derives from Chiappori and Salanie (2000). The test implies in statistical terms that there will be a positive relationship between two (conditional) distributions when there is information asymmetry. For two conditional distributions to be considered as positively related, they must be defined by comparable variables. The positive correlation test is used to link the amount of loan a borrower obtains and the default risk characteristics regarding the use of the loan. Adverse selection is alleged to occur when loan sizes positively correlate with default risk characteristics of individual borrowers. What this suggests is that borrowers with high default risks would likely obtain large loan sizes because they already know they are bad risks. The adverse selection is expected to be lower for the smaller, compared to the large-size borrowers. The adverse selection occurs because borrowers in the loan market tend to have better knowledge

of their risk characteristics than their banks a priori. The test approach is essentially built on the assumption that large loan size with costly coverage will be chosen by agents with higher default probabilities than the safe borrowers. This is explained as the basis of adverse selection as high risk borrowers will tend to choose contracts with larger risk exposure and costs than the low risks. The correlation test approach is usually used within a competitive setting such that contracts are highly standardized and can be described by a set of variables. The essence of this is to make empirical test of performance outcome against variables of prediction possible.

In the succeeding illustration of the positive correlation test methodology, a survey of 210 respondents who had made use of bank loan and/or is currently holding bank loan was examined. The positive correlation test confirms the hypothesis that borrowers were likely to select larger loan contract as their default risk increases. In the test, we control for the effect of exogenous factors such as preferences and risk aversion, which in most cases could become positively correlated with loan size. Consumers were assumed to be essentially risk neutral such that the incentive to increase loan size for risky borrowers can be attributed to only adverse selection and/or moral hazard.

5.5.1.1 Testing for Adverse Selection

The occurrence of adverse selection is based on the notion that there is a link between loan demand/size and default characteristics of borrowers when the loan contractual information is asymmetric. The test suggests that information asymmetry makes risky borrowers want to take larger loan than necessary when they know that their default probability is high. The occurrence of adverse selection during information asymmetry is due to the fact that borrowers are usually heterogeneous and that their characteristics is usually unknown to the borrowers, and that the risk characteristics are always hidden from the bank. The banks, based on the standard screening criteria examine only the observable information about borrowers in their loan consideration. With adverse selection, the borrower knows more about his risk type ex-ante than the bank does. Since the marginal utility of a loan at a given point

in time increases with the riskiness of the borrower, those who know that they are high risk will select loans with larger charges than those that are low risks.

In considering borrowers for loans, banks are interested in minimizing variations between the spread on their anticipated yield on the loan and the risk characteristics of the borrowers. The existence of unobserved information makes appraisal of loans and preconditioning of the borrowers behaviour after the loan is availed difficult. The occurrence of information asymmetry causes loan choices, repayment likelihood and loan sizes to be positively correlated as the risky borrowers are the ones that will likely demand larger loan amounts than the low risks. With information asymmetry, the risky borrowers will like to take up loans larger than they repaid or they will expend loaned funds will investment outside the purpose for which the loan had been procured (loan diversion). The test for adverse selection implies the confirmation of one/both of these hypotheses:

i) There is a relationship between the size of loan disbursed to borrowers and the default risk characteristics, and

ii) Borrowers' risk characteristics changes after loans are disbursed to them

The consequence of these two propositions is hinged on the belief that there is a link between loan sizes, default probability and information disclosure level of the borrowers. The occurrence of the first circumstance is the first order condition for the existence of adverse selection problem. Otherwise, if only unobservable information account for the link, we rule out the importance of undisclosed information and conclude that there is no adverse selection. The linkage between loan size (including interest rate payable on the loan) and repayment default is the basis of the correlation test methodology.

5.5.1.2   Testing for Moral Hazard

The existence of moral hazard in lending contract occurs when agents (borrowers) experience a sudden change in their incentive structure which causes private profit maximization to override mutually beneficial social incentive. The mutual social incentive is for the project for which the loan is used to finance to succeed, and the

loan repaid. The private incentive arises because borrowers want to appropriate all the gains of the loan alone by choosing to default. Either of the party attempt to privately maximize profit against the other. In most loan situations, incentive structure become endogenous to the type of loan chosen, or the loan is structured in a way that permits incentives to switch once all information relevant for the conditioning of adverse incentives are not observed or are ignored. Since adverse selection precedes moral hazard, a striking difference can be made between the two: adverse selection occurs because of the presence of unobservable private information about the borrowers which makes the loan size chosen to be correlated with the default risk, while moral hazard occurs because there is positive gain from defaulting. In a moral hazard situation, the borrower makes a decision about how much risk to take[61], while the bank bears the rest of the risks in default. The commonest occurrence of moral hazard[62] is when borrowers take private taken action to affect the probability distribution of their loan success outside the knowledge of the bank. The converse also applies in the case of the bank-dominated asymmetry. With information asymmetry, borrowers will have less incentive to reduce loan default through effort commitment. This will cause large loans to default more than the small loans. Borrowers, as a result do not select a particular loan size because their default probability is low. Rather, their default probability becomes related with the size of the loan they have selected. Large borrowers' incentive to repay diminishes as they face a contract that is not able to foreclose adverse incentives. The likelihood of adverse selection and moral hazard jointly occurring in lending situation is the reason why many studies do not attempt to separate the two occurrences (Stiglitz and Weiss, 1981; Bester 1983). In both the adverse selection and moral hazard situation, loan sizes will relate positively with default risk (see the estimated models in chapter 6).

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[61] By the amount of interest rate he is going to pay and/or collateral submitted

[62] Moral hazard is defined here to include the two types: ex-ante and ex-post moral hazard. The borrower may choose to become overly risky after obtaining the loan (hereby referred to as ex-ante moral hazard), but a wilful default, such as wrongly claiming that the ventured failed when it was profitable is an example of ex-post moral hazard.

5.6   Chiappori-Salanie Test Statistics (W)

Chiappori and Salanie (2000) propose a simple test as a complement to the positive correlation test. The test advocated does not rely on any specific functional form, assumption, preference, or the nature of equilibrium but examined the relationship between the residuals of two related conditional distributions that are affected by similar variables – which in this case are the ex-post and ex-ante default risk distributions. In adverse selection case, a borrower's default risk (likelihood) is expressed as a function of the lending criteria (referring to character, capacity, capital, collateral and conditions) which is implicit in the characteristics that are used to judge if a loan would succeed or not. A borrower, who based on the proceeds from the initiated investment, views the bank's lending rate as being too high is said to have a low capacity. Similarly, a borrower with poor character would view himself as can easily get away defaulting. The model has loan sizes, diversion of the loan (loan diversion), loan-collateral ratio, duration and lending rate as factors determining default likelihood. The rate of collateral commitment, amount involved (in relation to borrower's equity), and ex-post history of the borrower's loan success are also considered as part of the determining variables. The test compares the ratio of two models estimated with those characteristics of the borrowers before the loan is availed and after the loan is availed. Using the residuals from the two models, we estimate the W. When W is positive (W>0), the information asymmetry is suggested. W is defined as the ratio of two distributions (see equation 5.1). The equation is modified based on Chiappori and Salanie (2000, p.66)[63] and specified as:

$$W = \frac{\left(\sum_{i=1}^{n} \hat{\varepsilon}_i \ \hat{\eta}_i \right)^2}{\sum_{i=1}^{n} \hat{\varepsilon}_i^2 \ \hat{\eta}_i^2}$$

(5.1)

Where $\hat{\varepsilon}$ is the generalised residual from the default risk probit models (before the loan is availed), and $\hat{\eta}$ is the residual from the default risk probit (after the loan is availed). W is distributed X(1) with the null hypothesis of no asymmetric

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[63] Chiappori and Salanie (2000) developed the test statistics based on Gourikroux, *et al (1987).*

information. Under the null of conditional independence cov $(\hat{\varepsilon}_i, \hat{\eta}_{I,}) = 0$, W is distributed asymptotically as $x^2(1)$. This provides us with a test for the symmetric information assumption. If W=0 is rejected, this will imply that there is significant evidence that those with ex-post higher risk have the incentive to default based on the structure of the loan contract. This provides further evidence that observationally equivalent borrowers will default more when the default incentive is not been fully conditioned. Even with large collateral requirement, those with ex-post high risk will pledged less collateral (or at least value their collateral less than the amount borrowed). If we rule out the possibility that some omitted variable will be correlated with the dependent variables (with the correlations working in the right direction in both cases), rejecting W=0 shows evidence of asymmetric information. In order to ascertain which type of the asymmetry is dominant, the coefficient and size of the variables will form the basis of the conclusion. To implement this, we recall that the first order condition for adverse is that default risk characteristics must be positively correlated with the loan sizes. The loan size and default probability will be correlated because borrowers with larger loans will have greater ex-post incentive to default, or borrowers with higher ex-ante risk of default will select larger loans. When both ex-ante and ex-post risk characteristics correlates with default likelihood, the impact of the banking screening measures on the borrower's likelihood to pay can therefore be ascertained.

5.7   The Use of Probit/Logit Regression Approach

In estimating the impact of categorical variables on dichotomous default likelihood on loans, probit and logit regressions approach are often used (e.g. Edelberg, 2004). The use of probit and/or logit models is generally very useful for estimating dichotomous response variables and data. The approach arise from its superiority to the linear probability models which assumes that $P_i = E(Y = 1/X)$ increases linearly with X, and that the marginal or incremental effect of X remains constant. This practically cannot be realistic in the case of the borrowers, where the dependent variable is dichotomous. In the probit and logit models, as X increases, $P_i = E(Y =$

1/X) increases but never steps outside the 0-1 interval. The relationship between X_i and P_i are therefore not absolutely linear as in the linear regression approach. Primarily, response data can be logistically or normally distributed. For normally distributed data set, the probit models are the more appropriate (Cameron and Trivedi, 2009). The probit model has generally been more popular for the estimation of ordinal (and binary) response model. Using a probit link function, the logit analysis is a uni/multivariate technique which allows for estimating the probability that an event occurs or not, by predicting a binary dependent outcome from a set of independent variables. In terms of outcome, the logit model produce results similar to that of the probit regression in a relative large sample size. The choice of using probit or logit depends on individual preferences. The model is used to predict the probabilities of the different possible outcomes of a categorically distributed dependent variable; given a set of independent variables. The use of the models is preferred to the ordinary least square (OLS) methodology, which violates the homoskedasticity and normality of errors assumptions. Mainly, using OLS may result in invalid standard errors and hypothesis tests[64]. Logistic regression is essentially used for predicting the outcome of categorical (variable that can take on a limited number of categories) dependent variable based on one or more predictor variables. The probabilities describing the possible outcome of a single trial was modelled as a function of explanatory variables, using a probit function. The use of probit model allows for easier conditioning on the loan size and other variables of interest. The results in sections 6.5 through 6.10 shows that default risk characteristics using probit methodology. With 210 data sets used, the probit approach is considered to be more suitable in view of its popular usage for this kind of study[65]. Had the dependent variable been strictly binary, the logit approach would have been more preferable. Hahn and Soyer (2005) suggested that the logit model provide a better fit in the presence of extreme independent variable and conversely that probit fit random effects model better when there is moderate data set.

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[64] For a thorough discussion of the problems with the use of OLS or linear probability model, see Long (1997, p. 38-40)
[65] Similar study by Edelberg (2004) employed the use of the probit methodology.

5.7.1 Loan Default Function

The probability that a borrower will default on a loan (designated as ρ, and represented by question 30 of the questionnaire) depends on the size of the loan (question 16/17, scaled into four categories), the extent of information disclosure (question 26), interest rate charged on the loan question 10), collateral pledged (effort commitment, question 39), the consumer perception about stringency of the loan (question 40) and judgment on the fairness of interest rate (question 35), and the possibility of getting scot-free with the loan (question 56). Risky borrowers would make attempt to circumvent high effort by putting forward fake or encumbered collateral for multiple loans. In view of the foregoing discussion, the theoretical model estimated is presented as (5.2):

$$\rho = \acute{y}_1 + \sum_{d=2}^{5} \gamma_d \, (I_i^d) + \acute{y}_6 x_6 + \acute{y}_7 x_7 + \acute{y}_8 x_6 + \acute{y}_9 x_9 + \acute{y}_{10} x_{10} + \acute{y}_{11} x_{11} + \varepsilon \qquad (5.2)$$

Where I_i^d is an indicator function that takes the value of 1 if the borrower mis-spent an amount falling within any of the four categorizations[66]. The parameters x_6, x_7, x_8, x_9, x_{10}, and x_{11} are used to represent the extent of information disclosure, hidden information, collateral pledged (effort commitment), the consumer perception about stringency of the loan and judgment on the fairness of interest rate, and the possibility of getting scot-free with the loan. As contained in the questionnaire (see appendix c), the parameters x_6, x_7, x_8, x_9, x_{10} and x_{11} were obtained from questions 28, 26, 39, 40, 35 and 56. A question constitutes a default variable when the response supports the likelihood of the loan defaulting from each of the six questions. Loans given by banks rarely exceed $\frac{2}{3}$ of the value of collateral pledged when the term is between 12-18 months. For loans spanning into two or more years, the collateral required will be double or multiple of the current value of the loan. A borrower who judges the rate charged by the bank as being too high might likely want to default in repayment. The loan sizes were categorized into four of less than N500,001; above N500,000 but less than N2,000,000; above N2,000,000 but less than N5,000,000, and above N5,000,000 respectively for the variable x_{2-5}. When borrowers are not

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[66] Four categories of borrowers were considered: those borrowing less than N500,000(1); N500,001 – N2m(2); between N2000001-N5m(3); and above N5m(4).

classified according to their loan sizes, the loan size becomes a nominal variable and equation (5.2) will become as stated in 5.3:

$$\rho = \alpha_1 + \alpha_2 X_{2\text{-}5} + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_6 + \alpha_9 X_9 + \alpha_{10} X_{10} + \alpha_{11} X_{11} + e \qquad (5.3)$$

Where x_2 represents the loan size (referring to each of the four categories), and parameters x_6, x_7, x_8, x_9, x_{10}, x_{11} are as earlier defined. ρ represents the probability that loan availed were likely to default. In effect, it represents the default likelihood on each of the loans availed. A loan is likely to default as the possibility of each of the default variables occurring increases. From the estimation, information asymmetry occurs if the amount spent outside the purpose of the loan increase with the loan sizes. The empirical result of the specifications in equation (5.3) is shown in table 6.5, while the various categories resulting from equation (5.2) are presented in tables 6.6 - 6.10. By using the probit model, the results were observed to performed better compared to the logit counterpart. For a comparison of the results, the logit version is shown in tables 6.5a through 6.10a in the appendix.

5.8   The Role of Individual Perspectives in Default Risks

The dominant perspective in the literature explains information asymmetry with the borrower-advantaged (Bebczuk, 2003). The perspective generally views asymmetric risks as arising from the borrowers being likely to default. A positive relationship is observed to exist between information asymmetry and asymmetric risks. In the main, the presence of information asymmetry tends to magnify the size of asymmetric risks as each agent exploit their information advantage against the competing interest. This section attempts to estimate default risks, using common variables to establish the impact of the borrower (or the lender) on default occurrence. The two perspectives are contained in succeeding section.

5.8.1   Measuring Asymmetric Risk from the Perspective of the Banks and Borrowers

From the perspective of the bank, borrowers are traditionally seen as the source of default risks. As a result, the bank designs its contract to ensure that it preclude

borrowers from defaulting. Since the ex-post riskiness of the borrowers cannot be known to the bank ex-ante, the strategy to reducing default risk arises from its ability to design the lending contract to foreclose default. For instance, borrowers who have history of diverting[67] loaned money will be riskier than the one who spent the entire fund on the loaned purpose. Similarly, a borrower with limited liability will have greater likelihood to be risky than a borrower whose liability is unlimited. It is also possible that if a firm is able to obtain larger amount of money than required, it will have more incentive to undertake risky projects. In all situations, the bank designs its contract to ensure that the borrower is committed to want to repay loans once availed.

Asymmetric risks from the perspective of the borrower arise from two sources: the cost of fund and the return from investment. Going by our assumption of the banks as the sole source of fund, the main concern of borrowers on loans is the margin between the cost of the loan and the true expected return on the investment for which the fund will be used. But to the bank, the bank is concerned with the margin between its actual cost of fund and the expected return. Both the bank and borrower's net returns are affected when information is asymmetric. For this reason, bank rarely charge fixed interest rate on their loans. This information is always been hidden by the bank, which had the borrower known, he may not have accepted the loan. The borrower will always want to be sure of the exact cost of his loan. Otherwise, an initially profitable investment based on the extant interest rate may turn out to be unprofitable ex-ante. But banks are always careful in handing down a definite interest rate on any loan. One reason why banks in Nigeria vary their interest rate is because the baseline rate is usually pegged by the monetary policy. It is upon the baseline interest rate that all other interest rates derive. In view of this, an upward review in monetary policy rate triggers spiral changes in the cost of the banking system loans (including all active ones). This implication of this is that borrowers will end up paying differential interest rate across the instalment period, or may experience upward review in their formerly agreed fixed periodic payments. This, to the borrower is undesirable and alters the incentive constraint on the already active loan. The net return on a loan made can be

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[67] Spent on things outside the purpose of the loan

determined by the amount of effort (effort) committed on the loan, duration, extent of information availability (information), amount charged as interest rate on the loan (interest), and size of loan granted (size). As earlier defined, effort commitment is represented by the size of the collateral. Information is used to represent the extent of disclosure from the perspective of the bank, but the borrower considers how much of it was actually hidden. The resulting equation to be estimated is expressed as:

$$\Phi = b_0 + b_1 information + b_2 interest + b_3\, duration + b_4\, effort + b_5\, size + e \quad (5.4)$$

Equation (5.4) suggests a positive relationship between asymmetric information and default risk. Φ, representing the default risk is measured as the likelihood of occurrence of a borrower defaulting. Equation 5.4 implies that default risk (Φ) depends on whether there is occurrence of information asymmetry, too high an interest rate charged, duration of the loan, poor effort commitment and size of the loan. The difference in the measurement of asymmetric risks from both perspectives is in terms of what connotes information asymmetry. There are situation when bank may view the borrower as not fully disclosing information whereas the borrower may have been honest. In the other way round, he may have been asymmetric whereas to the bank the information asymmetry is unknown. For the sake of comparison, we estimate different models to assess the extent of disparity between the two perspectives of the causes of information asymmetry. The estimated equation is contained in tables 6.12 and 6.13. Both affirm a positive relationship between information asymmetry and asymmetric risk. Since asymmetric risk is undesirable to both agents, they would be strictly inclined to reducing default risk. The main impact of asymmetric risk is that increases the default incidence on loans. Andrianova et al (2011) had confirmed the existence of high loan defaults and lower overall lending as a result of information imperfections in some African countries.

5.9   A Game Theoretic Approach to Equilibrium Characterization

Game theory, a branch of mathematics has become an invaluable tool for characterizing strategic relationships between agents. Economic agents are known to react differently to incentives under different situations. In this section, attempt was

made to use a game-theoretic framework to characterise the borrowers' incentive of the equilibrium of bank lending. We situate a lending contract involving a heterogeneous[68] group of borrowers with private information about their risk characteristics, trading with a bank having hidden information about the charges they make on their borrower. The characteristics of the game are as follows.

5.9.1 Characteristics of the Game

We set out to characterize a two-stage game, identified by two players (agents): the bank and the borrower. The lending relationship arises because there is a mutually beneficial gain to both agents in the course of the lending. In particular, continuing lending relationships leads to lower rates of interest on subsequent loans, less stringent collateral requirements, and a lower likelihood of credit rationing (Berlin and Mester, 1999), and greater economic growth. The economy is bettered from the productivity growth created from lending actions. The gain that the agents make in the course of the lending is related to the type of equilibrium that will exist in the market. The focus here is hereby on a representative of bank and borrower who attempts to share the gains from a successful loan traded. The two players are described by their strategy spaces and payoffs which stipulate the rule of the game. In the first stage, the players (the bank and the borrower) are faced with a screening dilemma. The borrower, playing first requests the bank to submit an application for consideration for a loan to be approved for him. The bank playing in return is faced with whether to trust or not to trust the borrower's ability to repay, in view of the fact that not all information required is fully available. On securing the loan, borrower chooses whether to repay or not repay, but this is unknown to the bank. The acceptance to trust the borrower by the bank and proceed to disburse the loan leads to the second stage of the game where the payoffs are decided. Otherwise, the game ends and no loan nor profit is made by either of the agents. The timing of the signalling game in the first stage is illustrated as follows:

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[68] This occurs when H and L refers to the high and the low risks respectively. Mainly, H could be h_1 or h_2, but h_2 turns to be riskier than h_1. Same for L= l_1 or l_2.

1. Nature draws type t_i borrower (B_R) to the bank (B_K) from a set of types $T = \{t_1,..., t_n\}$

2. The borrowers are heterogeneous, with probability distribution $\pi(t_i)$ and this is unknown to the bank

3. The bank observes t_i and then interprets the message, m_j from a set of feasible messages $M = \{m_1,...,m_j\}$, which is dependent on the lending requirement.

4. The borrower observes the reaction from the bank, m_j (but not t_i) and then chooses an action a_k from a set of feasible actions $A = \{a_1,..., a_k\}$.

5. Payoffs to each agents are given by $U_{BR}(t_i, m_j, a_k)$ and $U_{BK}(t_i, m_j, a_k)$.

The choice faced by the bank in the screening game is whether to trust the information given by the borrower and approve (A) the loan or not trust it and disapprove (D)[69]. The borrower's strategy is whether to default (F) or repay (R) the loan after he had been disbursed the loan (see appendix C). Playing the game flows from an initial move by nature in the middle of the tree to the terminal nodes at the left or right hand side. It does not flow from an initial mode at the top of the tree to the terminal node at the bottom. Risky and safe borrowers have the probability of repayments of л and 1-л respectively in the game. Once the bank refuses to trust the borrower, the game ends effectively and payoffs will be zero. But banking essentially entails taking safe risks, and as a result banks would want to take some risks by trusting the borrower and disbursing the loan. Otherwise, no lending and profits would be made on deposits. The bank forfeits its payoffs to the borrower when it trusts and the borrower defaults. This is the outcome which the banks also want to avoid, and are strictly interested in extending credits to the safe borrowers only. The dilemma essentially derives from the quality of information upon which the decisions are made. Banks want to make loans as much as the borrowers seek to be funded and repay. But it may not be able to control the distribution of its borrower types which could be risky, mixed or non risky (see figures C1-3 in the appendix). The closest approximation of this game is that the two players play simultaneously,

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[69] Trusting the information may also imply considering such as adequate to ensure that loans granted would be repaid.

and decides their moves independently and this occurs in stage 2 after the loan had been disbursed to the borrower. Our concern is on how the payoffs from the loan are shared by the players. In the main, we want to obtain actual payoffs that accrue to each player in stage 2. An underlying feature of this kind of game is that the payoff to each player is dependent on the level of information availability at the point of making the moves. We consider the bank to have superior information over the borrowers given two conditions: First, it is in position to accurately predict the actual yield of the prospective investment more than the borrowers. For this, it could use predatory lending practices against the uniformed borrowers. Secondly, in a situation where borrowers are informationally captured by their banks and as a result cannot seek competitive price for their loan with the outside banks. The bank in question has more information than other banks about the quality of its own customers, and this information advantage it could utilize to cheat borrowers (see Sharpe, 1990; von Thadden, 2001). The bank could bask on the advantage to extract a rent from the borrowers over and above what they would have been charged at the competitive market. Information asymmetry makes it difficult for one bank to draw off another bank's good customer without also adversely selecting (Sharpe, 1990). Traditionally, the borrowers would want to earn more profit in a funded project than the bank. But the bank would want to earn more profit from the investment than the borrower. This it can only do by cheating and undercutting on information disclosure. For the bank to maximize profit, it introduces hidden charges for the borrower as a way of undercutting his profit. We characterize the equilibrium of the game under two scenarios: when the borrower is the more informed, and when the bank has superior information. The extent to which the bank or the borrower's profit is affected depends on an interaction variable g. The g determines how much each of the players benefits from the information game.

5.9.2 Equilibrium with Information Asymmetry

A borrower is said to have superior information when he knows more about the true expected return on the investment being financed than the bank. For the sake of analysis, we denote the level of information disclosure (S) chosen by each player as

S_{BK} and S_{BR} for the bank and borrowers respectively. For the sake of simplicity, the information disclosure level of each players is limited to the intervals (0, 1), and we assume that each player chooses his or her strategic level independently in stage 2. By implication:

$$0 \le S_{BK} \le 1 \text{ and } 0 \le S_{BR} \le 1 \qquad (5.5)$$

Equation (5.5) implies that both players have a discretionary continuum of information disclosure level-strategies which ranged between 0 and 1. At one extreme, a player can choose to be wholly asymmetric ($S = 0$), and at the other extreme, each can choose to disclose all information required ($S = 1$). In effect, the choice of information disclosure level is the major strategy. The best choice for each player (choice that maximizes individual payoffs) is dependent on the disclosure level chosen by the other player. The rule of the lending game is simple and straightforward. The bank (playing first) decides independently how much to charge for investing in the proposal (investment) brought to it by the borrower, and the borrower decides to take up the loan subject to the fact that the expected return from the investment is higher than the cost of the loan. The profitability on the investment is probabilistically determined.

The commonest analogy in bank lending is that the bank is drawn to financing an investment of which the borrower is the more informed. Convinced of the borrower's proposal, the bank goes ahead to fund his investment. Within the borrowers, he has hoarded some unpleasant information about the loan from the bank, which had it known; the loan would have been turned down. Full disclosures of all relevant information by the borrower forestall opportunity to obtain the loan. The closest approximation to reality in sharing of the profit from the loan is that most borrowers would want to earn, at least two-third of the profits. Were this to be the case, the bank takes the one-third remaining, which is recouped via the interest rate it charged. The only way the bank can be asymmetric is for it to introduce hidden charges to increase the take off in the resulting profit of the investment. We can observe the implication of the individual information disclosure on their payoffs functions. We

concentrate on the situation where the borrower has superior information in our game analysis.

5.9.3   The Payoff Function and Best Response

The payoff (V) of each player is expressed as a function of their combined efforts and information disclosure levels (that is, S_{BK} plus S_{BR}), divided by the supposedly profit sharing ratio, minus the private cost of efforts made to ensure the success of the contract. The optimal realization from the loan requires that both players make full information disclosure. However, each agent is also driven by the incentive to maximize private profit, which is possible only by cheating on information disclosure. Expectedly, banks would want to earn as much (if not more than) the borrowers, since they are the source of the fund. But the risk taken on the part of the borrower is more strictly related to profitability. Borrowers, being the initiator of funded investment will want to take the larger gain from the profits made. In fact, for the borrower, the higher profit incentive is the reason for undertaking the investment, and by extension – seeking the loan. As a result, the borrowers would rarely want to share profits equally with the bank in the eventual realization of the loan. We begin the analysis with a situation where the bank has superior information. For both players, effort commitment to the successful realization of the loan is costly, and the payoffs to each of the players (V_{BK} and V_{BR}) can be expressed as equations (5.6) and (5.7) respectively:

$$V_{BK}(S_{BK,}\ S_{BR}) = (^1/_3)[\ S_{BK} +\ S_{BR} + (S_{BK})(S_{BR})(g)] - (S_{BK})^2 \qquad (5.6)$$

$$V_{BR}(S_{BK,}\ S_{BR}) = (^2/_3)[\ S_{BK} +\ S_{BR} + (S_{BK})(S_{BR})(g)] - (S_{BR})^2 \qquad (5.7)$$

The payoffs of each player is a function of both individual information disclosure levels and that of the other player plus the combined effect of the disclosure, multiplied by the constant g, which is the positive-interaction gain (such as opportunity for future financing, profits, etc)[70], minus the private costs to the player

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[70] Even as profit incentives underlie bank lending, future consequences of current behaviour act to leverage lending disequilibrium where they occur. In view of this, bank loans are usually made in view of any realizable future (or long-run) benefit that is derivable.

for contributing some effort to the successful realization of the loan. Following Guerra-Pujo (2009), we assume for the sake of simplicity that g = [0, 1], and that the cost corresponding to individual's effort level is taken to be the square of each player's effort information disclosure level. Essentially, agents try to minimize information disclosure, as the possession of information advantage confers some economic advantage. In addition, the cost of providing extra unit of effort to ensure repayment is increasing in the amount of effort already provided. This simplification allows us to preserve a linear payoff function. The multiplicative relationship between the combined efforts at information disclosure, $((S_{BK})(S_{BR}))$ and the interaction gain, g implies that there is a greater gain in cooperating to fully disclose information than otherwise. Fuller information disclosure enhances the bank's ability to apply appropriate interest rate on the loan and sustain the mutual trust between it and the borrowers which is necessary for the eventual repayment of the loan. In effect, fuller information disclosure leads to reduction in perception bias, which is can be a causative factor to default[71].

The best response (BR) of each player represents the payoff maximizing functions. Mainly, each player would be interested in the best possible response of the other within their strategy sets. By converting the analysis to a maximization problem, using variables of interest; we can find the first and second order conditions for the payoff functions of the players. From the general perspective, both players would want to maximize their financial rewards from the investment. Beginning with the bank, we can find the bank's best response - the point at which the bank maximizes its payoffs given the strategy set S_{BR} of the borrower, by taking the first derivative of the bank's payoff function (dV_{BK}) with respect to S_{BK}. The succeeding expression becomes:

$$dV_{BK}/dS_{BK} = (^1/_3)[\ 1 + 1(S_{BR})(g)] - 2S_{BK}$$

$$= (^1/_3)[\ 1 + (S_{BR})(g)] - 2S_{BK} \qquad (5.8)$$

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[71] The perception of the borrowers about the sincerity and fairness of the bank matters for repayment. Where borrowers are generally biased, and as a result see loans as personal share from the national bounty ('cake' as popularly referred to), default incidence tends to be high.

Since $d^2V_{BK}/d(S_{BK})^2 = -2 < 0$, we conclude that the first order condition of the payoff function is the maximum. Having maximized the payoff function, we obtain the bank's best response ($BR_{BK} = S'_{BK}$) to the borrower's strategy set S_{BK}. This implies that we set equation (23) equals to zero, and substituting S'_{BK} in the place of S_{BK}, and solve.

$$(1/3)[\ 1 + (S_{BR})(g)] - 2S'_{BK} = 0$$

$$(1/3)[\ 1 + (S_{BR})(g)] = 2S'_{BK}$$

$$BR_{BK}(S_{BR}) = (1/6)[\ 1 + (S_{BR})(g)] = S'_{BK} \qquad (5.9)$$

Equation (5.9) represents the bank's best response to each possible choice of information disclosure chosen by the borrower. The derivation of the borrower's best response (BR_{BR}) is hinged on the assumption that borrowers will want to earn two-third of the returns from the loan-financed investment, while the bank share 1/3. Following similar mathematical operations, the borrower's best response function, BR_{BR} to the bank's strategy can be specified as:

$$BR_{BR}(S_{BK}) = (1/3)[\ 1 + (S_{BK})(g)] = S'_{BR} \qquad (5.10)$$

The resulting equilibrium in information disclosure depends essentially on the value of the interaction gain, g. In essence, the greater the information disclosed, the greater is the gain to each of the players. Since the gains are partially individually excludable, there is incentive by each of the players to privately maximize own payoff function over the social function by not disclosing much information. For the agents, strategies are the level of information to disclose to each other, bearing in mind that full information disclosure reduces their information rent. Attempt is made in the next chapter to observe the implication of varying the information disclosure of each of the players, while holding the strategies of the other constant. We assume that when banks decide to be asymmetric, they lose the gain from g (g=0).

CHAPTER SIX

DATA AND RESULTS

6.1   Introduction

This section is dedicated to analysing and discussing the data and findings of the study. It covered the activities of the banks since the existence. The loans considered spanned between 2000 and 2012, with a good number of the borrowers still having up to 2013 to liquidate their loans. In addition, there were a number of borrowers who having liquidated their loan past loan, had applications for new loan to be activated for them. The loans considered comprised both consumers and investment loans. The analysis done were based on a cross sectional data; obtained from 15 banks in 12 states of Nigeria. Econometrics and game theory were used for the analysis. The test for information asymmetry was estimated by comparing default characteristics with the loan sizes using the Chiappori-Salanie test statistics (W). The characterization of the equilibrium was done using game theory approach.

Table 6.1: Some details of the respondents' characteristics

Descriptions	Frequency	Per cent
Nature of Business Funded: Small scale	74	35.2
Medium Scale	90	42.9
Large Scale	46	21.9
Total	**210**	**100**
Age (years)		
Less than 30	20	9.5
31-40	90	42.9
41-50	66	31.4
51-60	32	15.2
60 and above	2	1.0
Total	**210**	**100**
Place of residence		
Urban	154	73.3
Rural	56	26.7
Total	**210**	**100**
Years of Experience:		
1-3	32	15.2
4-5	66	31.4
6-10	78	37.1
Above 10	34	16.2
`Total	**210**	**100**
Educational Level:		
Primary	12	5.7
Secondary	50	23.8
Tertiary	132	62.9
Others	16	7.6
Total	**210**	**100**
How long have you used loan financing		
Less than 1 year	24	11.4
1-2 years	68	32.4
3-5 years	44	21.0
Above 5 years	74	35.2
Total	**210**	**100**
Duration of the loans		
Less 1 year	136	64.8
2-3 years	44	21.0
4-5 years	20	9.5
Above 5 years	10	4.8
Total	**210**	**100**
Loan Sizes		
Less than ₦500,000	146	69.5
₦500,000- ₦2million	48	22.9
₦2million – ₦5million	4	1.9
Above ₦5million	12	5.7
Total	**210**	**100**
When the loan was Availed		
Before year 2001	32	15.2
Between 2001-2003	48	22.9
Between 2004 and 2007	54	25.7
Between 2008 and 2011	68	32.4
After 2011	8	3.8

Do you actually succeeded on the loan		
No	86	41
Yes	124	59
Total	**210**	**100**
Involved in moral hazard?*		
No	156	74.3
Yes	54	25.7
Total	**210**	**100**
Borrowers' view of the bank rate		
Fair	92	43.8
High	118	56.2
Total	**210**	**100**
Amount of the loan disinvested		
None	14	6.7
5-10%	66	31.4
10-20%	62	29.5
20-3-%	32	15.2
Above 30%	36	17.1
Total	**210**	**100**
Collateral-loan value ratio: 2:1	92	43.8
3:2	90	42.9
3:1	28	13.3
Total	**210**	**100**
Offered letter before the loan was availed: Borrower?		
No	98	46.7
Yes	112	53.3
Total	**210**	**100**
Borrower: Do you think you can go scot-free with the bank's fund?	164	78.1
No	46	21.9
Yes		
Total	**210**	**100**
Borrowers: Bribed an officer/anyone before the loan was availed		
No	174	82.9
Yes	36	17.1
Total	**210**	**100**
Borrowers: How many time have use used bank loans?		
Once	110	52.4
Twice	62	29.5
Three times	12	5.7
More than three times	26	12.4
Total	**210**	**100**
Borrowers: Have any of such loan failed in the past?		
No	124	59
Yes	86	41
Total	**210**	**100**

*used to referred to dis-investment, misallocation or diversion of any of the loaned fund.
Source: Author's Field Survey

6.2   Empirical Results

This section contains 5 sets of results. Subsection 6.2(a) presents the results of default risk variables that were positively correlated with the loan sizes. Subsection 6.2(b) present the probit result, from which we establish the magnitude of the asymmetry in terms of the variables of concerned. Subsection 6.2(c) presents the Chiappori-Salanie test which is used to support the results presented in Subsection 6.2(a). The Subsection 6.2(d) presents the result in terms of the perspectives of the bank and the borrowers in terms of their individual perception of the sources of the asymmetry. Subsection 6.2(e) presents the result of the game theory analysis which characterized the equilibrium position of the agents in the market. Each of the results is presented in secessions below.

6.2. (a) Positive Correlation Results

Following the use of the correlation test as the dominant approach for testing information asymmetry, the result of the correlation test showed a mixed evidence for the presence of information asymmetry with respect to the various variables that were used to measure the incidence of default risks. The two correlations estimated in this study were the cross correlation between the borrowers default characteristics and the loan sizes. This we did under two scenarios: with respect to the loan sizes sought from the bank and the loan sizes that were actually released. The essence of the distinctions between the two scenarios is to allow distinguishing between the changes in the characteristics before the loans were availed and after it was availed to the borrower. In the estimation, we suppose that all loans are fully collateralized, such that default factors (variables) are the only cause for adverse selection and/or moral hazard. To implement the test, we compare the coefficients, in terms of the signs, magnitudes and change under the two conditions. In the general, all positively signed variables, as indicated with the asterisk * signified the positively correlated default variables across the loan sizes. The positive correlation shows in part, that there is the presence of information asymmetry. Whether it is adverse selection or moral hazard was therefore to be determined by further estimation.

Nine variables/responses were used to represent default risks, of which an increase in the coefficient implied that the loans were more likely to go default. They include: incomplete information disclosure (from the borrowers' perspective); hidden information (from the bank's perspective); the ex-post success state of the borrower; was there any moral hazard (from the bank's perspective); if the borrower(s) viewed the bank rate as too high and therefore seek to default or became unable to repay; if the bank's screening measures were stringent enough to foreclose default (from the borrower's perspective); how much of the loan was spent on exogenous activity, if the borrower thinks he could go scot free with the bank loan; and if the borrower had failed in past loans. Each of the questions represented in their affirmative state implies the presence of default risk for their occurrence. The characteristics of the default variables were examined under two situations: while the loan was being applied for and when it was actually been released. In effect, the loan sizes were categorised into four groups of less than ₦500,000; between ₦500,000 and 2million; between ₦2million and ₦5million; and above ₦5million. Adverse selection, which is defined by the ex-post changes in the default characteristics of the borrowers, was observed to be lower among borrowers who applied for smaller loan sizes (e.g. less than ₦500,000) than those who applied for larger loans sizes (especially for those between ₦500,000 and 2million, and between ₦2million and ₦5million). For the presence of adverse selection to become a major concern in the loan market, the default characteristics are expected to worsen after the loan has been disbursed than when the loan had just been applied for. From tables 6.3 and 6.4, we observe that the default characteristics do not significantly worsen. As a result, the existence of adverse selection can be claimed to be less dominant, and suggests the leading influence of moral hazard as accounting for the lending defaults. In each of the four columns representing the loan sizes in table 6.2, 5,10,7 and 5 default variables were found to be positively correlated. This is in comparison to 6, 11, 3 and 7 as observed in table 6.3. Borrowers seeking below ₦500,000 were as likely to default as those seeking above ₦5million in table 6.2. This implies that the very low and high borrowers were not significantly the source of the default. But in table 6.3, the larger

volume borrowers became more likely to default. Loans falling within these two categories were likely to be for individual businessmen and corporate enterprise. The long run profit goal of their firms might have been responsible for this. Most loans likely to default were those ranging between ₦500,000 and ₦2 million. In comparison with table 6.3, which shows the ex-post characteristics of the borrowers when the loans was actually being availed, the behaviour of the default risk variable across the category was not significantly different, though the concentration across the categories changed. More borrowers in the category of less than ₦500,000 and above ₦5million were more likely to default than when they were not yet availed the loan as in table 6.2. Borrowers seeking between ₦2million and ₦5million became eventually less risky. In terms of the magnitudes of the positive correlations, the variations between the two scenarios (of tables 6.3 and 6.4) were not significantly different.

In terms of the behaviours of the specific default variables, requirement of higher collateral ratio (3:1) was observed to be very effective in conditioning borrowers in category of loans less than ₦500,000 and above ₦5million to repaying their debt and a result reduced any information asymmetry that was likely to result from the borrowers. The incidence of adverse selection was lowest for loan in the category loan between ₦2million and ₦5million. Borrowers who diverted some part of the borrowed money were observed to were still being able to make repayment among the larger size borrowers (referring to loan size between ₦2million to ₦5million and above ₦5million), unlike for the borrowers of less than ₦500,000. Adverse selection is observed not to follow the trend at which the loans were utilised. A number of borrowers who misallocated their loans were observed to have been able to repay. This outcome can be attributed to the fact that ability to repay could result from a number of other factors such as the returns from the investment made with the loan, the willingness of the borrower to repay and not solely on whether there was information asymmetry or not. What is perhaps more interesting about the results is that when the likelihood of adverse selection is larger, the stringent bank's screening criteria was not able to eliminate information asymmetry. Thus, in the presence of

information asymmetry, bank screening and collateral requirement becomes invalid tools for foreclosing defaults. Rather, the structure of information asymmetry among the various categories of loan application became altered depending on the effect of the screening measures on each borrower. The incidence of moral hazard reduced for borrowers of loan size between ₦2million and ₦5million, and became concentrated on those who sought for between ₦500,000 and ₦2million. While the structure of the loan contract permits many risky borrowers to be included in the pool, the resulting adverse selection appears not to be affected by the ex-post success history of the borrowers as well as the size of the loan that was disinvested. Most borrowers with past records of bank failures who were able to secure larger loans had greater likelihood to fail in their new loans. The outcomes point out to the fact that a number of important information about borrowers does remain unobservable to the banks even while loans are availed. Moral hazard was observed to persist even with the stringency of screening criteria (for instance, borrowers who obtained loans between ₦500,000 and ₦2million succeeded and still likely took asymmetric action.

Testing for information asymmetry using the correlation test methodology implies that the borrowers' characteristic ex-ante and ex-post to the availance of the loan must be significantly different. While the positively correlated default risk variables increase after the loan had been availed, the near similar distribution of the default variables presents only a weak presence of the presence of information asymmetry. The existence of seemly similar incidence of positive correlation in the two tables (6.3 and 6.4) therefore suggests the existence of adverse selection mainly; while moral hazard can be deduced by the extent to which the borrowers after being availed the loans decide to misappropriate the loan. In part, the non-specificity of the range of the magnitude in the variables beyond which either of the phenomena can be said to occur is a major limitation to relying solely on the use of correlation test methodology for testing information asymmetry. Because of the inconclusive nature of the result from the use of positive correlation test, the Chiappori-Salanie test statistics (W) was used in section 6.5 to validate the test for the presence of information asymmetry.

Table 6.2: Correlations between loan sizes sought and default risk variables

Default risk variables	Loan Sizes			
	Amount Applied < ₦500,000	Amount Applied (₦500,000- ₦2m)	Amount Applied (₦2m- ₦5m)	Amount Applied (> ₦5m)
Incomplete info. Disclosure	0.219*	0.276*	-0.101	-0.005
Hide information	-0.234	0.169*	0.031*	0.139*
Succeeded on the loan?	0.004*	0.100*	0.026*	-0.205
Took asymmetric action?	-0.321	0.354*	-0.082	0.043*
Viewed bank rate as too high	-0.126	0.069*	-0.158	0.217*
Bank as being stringent enough to foreclose default?	0.080*	-0.055	0.009*	-0.066
5-10% of fund spent on other things	-0.042	-0.027	-0.094	0.187*
10-20% of fund spent on other things	0.020*	0.045*	0.063*	-0.159
20-30% of fund spent on other things	-0.065	0.085*	0.135*	-0.104
>30% of fund spent on other things	0.082*	-0.067	-0.063	-0.003
Spent some part outside the project	-0.118	0.026*	0.043*	0.162*
Scot free with the bank loan?	-0.300	0.260*	0.263*	-0.031
Had failed in a loan in the past	-0.164	0.239*	-0.116	-0.038

Source: Authors' computation

*refers to the positively correlated variables

Table 6.3: Correlations between loan sizes disbursed and default risk variables

Default risk variables	Loan Sizes			
	Amount Released < ₦500,000	Amount Released (₦500,000- ₦2m)	Amount Released (₦2m- ₦5m)	Amount Released (> ₦5m)
Incomplete info. Disclosure	0.071*	0.006*	-0.032	-0.113
Hide information	-0.186	0.190*	-0.057	0.099*
Succeeded on the loan?	-0.156	0.215*	-0.067	0.010*
Took asymmetric action?	-0.113	0.268*	-0.070	-0.157
Viewed bank rate as too high	-0.129	0.143*	-0.072	0.082*
Bank as being stringent enough to foreclose default?	0.011*	0.059*	-0.097	-0.020
5-10% of fund spent on other things	-0.274	0.237*	0.066*	0.066*
10-20% of fund spent on other things	0.084*	-0.040	-0.006	-0.089
20-30% of fund spent on other things	0.091*	-0.096	-0.007	-0.007
>30% of fund spent on other things	0.124*	0.119*	-0.020	-0.020
Spent some part outside the project	0.001*	0.043*	0.043*	0.043*
Scot free with the bank loan?	-0.188	0.221*	-0.049	0.166*
Had failed in a loan in the past	-0.156	0.027*	0.088*	0.004*

Source: Authors' computation

*refers to the positively correlated variables

6.2. (b) Conditional Probit Results

Table 6.5 contains the probit[72] results for the default risk estimations. The underlying models[73] for the estimations assumed that all the agents were faced with equal investment risks irrespective of their loan sizes. In reality, banks give considerations to borrowers based on their loan size and/or their estimated default risk. In effect, the borrowers are categorised into different risk characteristics, based on how much was availed to them and the amount invested outside the purpose of the loan. The result gave the prediction about the general determinants of default incidence when information is asymmetric. The log likelihood ratio chi-square with their p-values showed that the results were observed to be statistically significant. Compared with the Hosmer-Lemeshow statistics (which is not applicable herein as explained in section 5.7), the results based on the chi-square values do not show any significant lack of fit. The results converged generally at their fourth iterations and closely without wide swings in-between the iterations. The result showed when borrowers disinvested 5-10%, 10-20%, 20-30% and more than 30% of their loaned funds as in columns (1), (2), (3) and (4) respectively. It assumed all borrowers to have been availed equal sizes of loans, such that the source of the categorization derives from the amount that is being mis-apportioned. The result showed that the size of the loan disinvested (or spent on things outside the loan agreement) reduced as the probability of repayment increased, except for borrowers in category 3.

For agents with equal sizes of loan but with different collateral requirement, or disinvested varied portion of their fund, the default risks were compared. In each of the loan size categories, borrowers with general and specific adverse selection variables were evaluated based on how each of the default variables affect the likelihood of succeeding in the repayment of the loan. The categorization followed the order of a-d (and also e-h) as in table 6.2 (and 6.3). Incomplete information disclosure was observed to fall for borrowers who were more likely to succeed on

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[72] The logit counterparts are presented in the appendix for the consideration of the reader. Generally, the results from the two regression outcomes are not significantly different.

[73] Specified as 11 and 12

the loan. While hidden information and moral hazard were observed to decrease across the categories, many loans still succeeded with its presence. Collateral requirement and bank's stringency were observed to be important for repayment. Much of the borrowers in category 1 viewed the interest rate as too high. The perception about interest rate however made them to want to repay faster more than the borrowers in the categories 2, 3 and 4. Borrowers who had failed in past loan were able to repay more for borrowers in the categories 3 and 4.

6.2 (c) When Banks are information Asymmetric

When there is no information asymmetry, the bank and the borrowers are bounded by the offer letter. The offer letter specifies the terms and conditions underlying every loan availed. Its content includes the term, repayment schedule and the applicable interest rates. It is usually issued by the lending bank to the prospective borrower precedent to the disbursement of the loan. The offer letter as at the date of its dispatch is expected to be vetted and consented to by the borrower within a minimum of 3 days to the effective take-off date of the loan to make necessary judgment whether to accept or turn down the loan. If the letter is eventually consented to and returned to the bank, the bank will make available the loan (premised on the condition that the required lending conditions have been met). The letter spells out the details of the conditions precedent to the draw downs on the loan. Thus, when charges are applied outside the specification in the offer letter, such situation is referred to as being asymmetric. By the same vein, any loan that is availed without it being duly documented by the bank or arising as a subsidiary loan from the bank staffs is perceived as been asymmetric. Cost on Transaction (COT) and Value Added Tax (VAT) become effective once the loan is activated. Within the banking industry, a set of charges are observed to be generally applicable on loans. A penalty charge is applied when a customer defaults on repayment date and is calculated on a daily basis at a programmed compounding interest rate until the defaulted payment is made. While COT may be negotiable for large-volume customers, VAT is deducted to the federal government and as a result fixed by the necessary statutory provision which at present is 5% in Nigeria.

Even as the above charges are identified, a number of other implicit costs exist. It is on these charges that borrowers usually perceive the banks as being asymmetric. The charges go by the names such as management fee, processing fee, quarterly fee, penalty fee, professional fees, etc. The charges are in many instances meaning the same thing, but banks may capitalise on their asymmetric advantage to charge the borrower more using the other various names. In loans for asset acquisition, banks may require that an insurance policy be obtained for the asset acquired such that there would be certainty of recouping the availed fund in the case of any eventuality. In addition, legal fee may be required to encumber the ownership of any required titled documents that is surrendered as collateral security. The borrower pays these costs in most cases. Based on the credit policies of individual banks, the amount charged as loan sub head differs. Despite this, the cumulative interest rates charged among the banks tends to vary only marginally. While the principal interest rate may vary in response to the monetary policy rate of the central bank, other charges are rarely volatile. The probability of default was modelled as a linear combination of the predictors. Given that no part of the loan disbursed to the borrowers is diverted, we are interested in how not disclosing full information (by the borrower), hidden information (by the bank), the likelihood of moral hazard, perception of the lending rate as being too high (by the borrower), size and importance of the collateral required (of the borrower), the extent of the stringency of the lending conditions, the legal institutions that would not allow defaulted borrower to get scot free with the loan, probability that the borrower will fail in the present loan (having failed in the pasts), affect the defaulting on a loan. The dependent data set has a binary response (default/not default).

Table 6.4: Probit regression when borrowers were classified based on the amount disinvested

Default Incidence	5-10% disinvested Coefficient	10-20% disinvested Coefficient	20-30 disinvested Coefficient	> 30% Coefficient
Not fully disclosed Information	-0.430(0.216)**	-0.485(0.215)**	-0.540(0.222)**	-0.509(0.215)**
Hidden information	0.807(0.213)***	0.771(0.209)***	0.697(0.217)***	0.685(0.217)***
Involved in moral hazard	0.539(0.240)**	0.486(0.237)**	0.565(0.248)**	0.444(0.239)*
Judged bank rate as too high	0.014(0.211)	-0.146(0.200)	-0.125(0.205)	-0.173(0.200)
Collateral pledged 2:1	0.236(0.199)	0.276(0.199)	0.345(0.208)	0.241(0.197)
Considered stringency as weak	0.128(0.210)	0.244(0.209)	0.149(0.213)	0.225(0.205)
Could default scot-free	0.608(0.234)***	0.680(0.233)***	0.810(0.240)***	0.725(0.236)***
Failed in the past loan	0.588(0.212)***	0.614(0.214)***	0.698(0.219)**	0.606(0.213)***
Constant	-0.968(0.260)***	-1.044(0.259)***	-1.267(0.268)***	-0.914(0.268)***
Prob > chi2	0.000	0.000	0.003	0.062**
Pseudo R2	0.202	0.189	0.239	0.197
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

(ii) The values in the bracket are the standard errors

The borrowers who disinvested 5-10%, 10-20% and more than 30% of their loaned funds have probability of about 47.5%, 11.9% and 45.8% not defaulting respectively in their loans. For borrowers who misspent between 20-30% of the fund, they have they have about 117% of defaulting. The results across the categories suggest that borrower with hidden information and who actually disinvested part of their loaned fund were still able to make repayment. Borrowers who disinvested more of their fund became faced with repayment burden. Information disclosure remained inversely related to repayment success. Hidden (unobservable) information, moral hazard, borrowers' judgement, collateral requirement, extent of stringency and ex-post failure characteristics of the borrower were positive determinant of repayment probability. Borrowers who had failed in past loans has approximately 58, 61,70 and 61 per cent chances to succeed in the new loans obtained, and this incidence increases as more of the currently borrowed fund is disinvested[74]. This kind of information remains hidden to the bank. As the proportion of loan mis-apportioned increased from 5-10% to 10-20%, the incidence of default fell from 47.5 to 11.9 per cent, rose with the mis-apportionment in the category (20-30%) by 117.6 per cent, but finally fell in the category 4 (above 30%) by 45.8 per cent. The result showed a mixed evidence to support the presence of information asymmetry. Even as that, the coefficients of determination were weak in the regression categories. In view of this, we considered further the situation where amount mis-apportioned and/or released were categorised by other benchmarks. This was intended to enable observe the change in the ability of the variables to predict loan success when the other forms of categorizations are introduced.

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[74] The equivalent values for column 2, 3 and 4 are approximately 61%, 70%, and 60% respectively.

Table 6.5: Probit regression when only 5-10% was diverted across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	-0.395(0.219)**	-0.414(0.218)*	-0.440(0.217)**	-0.453(0.220)**
Hidden information	0.776(0.215)***	0.765(0.214)***	0.801(0.213)***	0.827(0.216)***
Involved in moral hazard	0.549(0.242)**	0.459(0.247)*	0.528(0.240)**	0.499(0.250)*
Judged bank rate as too high	-0.007(0.212)	-0.033(0.213)	-0.010(0.213)	-0.173(0.200)
Collateral pledged 2:1	0.236(0.199)	0.276(0.199)	0.345(0.208)	0.241(0.197)
Considered stringency as weak	0.108(0.212)	0.070(0.215)	0.104(0.213)	0.136(0.211)
Only 5-10% disinvested	-0.555(0.252)**	-0.626(0.254)**	-0.474(0.238)**	-0.457(0.239)*
Could default scot-free	0.537(0.249)**	0.455(0.247)*	0.605(0.235)**	0.618(0.235)***
Failed in the past loan	0.558(0.215)***	0.615(0.216)***	0.602(0.213)***	0.623(0.221)***
Constant	-0.733(0.355)**	-0.893(0.262)***	-0.924(0.264)***	-0.974(0.261)***
Prob > chi2	0.000	0.000	0.003	0.062**
Pseudo R2	0.205	0.216	0.205	0.203
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level based on the probability values.

(ii) The values in the bracket are the standard errors

The result in table 6.5-8 differs from table 6.4. In terms amount of the loan funds that were disinvested (spent on other purpose outside the loan). Table 6.5 show result for those who invested at least 95% of the loan for the purpose it was meant for. The result showed also that the level of information disclosure is inversely related to default incidence. The results for borrowers who misspent higher levels of their loans were shown in the subsequent tables for the sake of comparison. Incomplete information disclosure, borrowers' judgement of the bank rate and mis-apportionment of fund were the main variables that hindered loan repayment. Basically, information disclosure remained negatively signed as in table 6.4, and subsequently across all the regression tables, which suggest that incomplete information disclosure permeate through the loans made.

Table 6.6 presents the result when amount mis-apportioned ranged between 10-20%. The result showed that higher disinvestment of borrowed fund actually instigates default risk. As more of the borrowed funds are disinvested, the incentive to repay reduces while the revenue from the loan becomes inadequate to offset the cost. Table 6.6 differs from table 6.5 by in term of the amount of loan misappropriated. The result showed that borrowers who mismanaged between 20-30% of their borrowed funds are 114-115 per cent likely to default on the repayment of their loan.

Table 6.6: Probit regression when only 10-20% was diverted across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	-0.480(0.217)**	-0.481(0.216)**	-0.495(0.216)**	-0.522(0.220)**
Hidden information	0.764(0.212)***	0.741(0.216)***	0.764(0.210)***	0.808(0.213)***
Involved in moral hazard	0.484(0.237)**	0.4133(0.244)*	0.474(0.237)**	0.425(0.247)*
Judged bank rate as too high	-0.152(0.204)	-0.191(0.204)	-0.164(0.203)	-0.121(0.203)
Collateral pledged 2:1	0.270(0.201)	0.226(0.203)	0.280(0.200)	0.275(0.200)
Considered stringency as weak	0.242(0.209)	0.222(0.210)	0.222(0.211)	0.258(0.210)
Only 10-20% disinvested	-0.113(0.224)**	-0.090(0.224)**	-0.114(0.222)**	-0.150(0.225)*
Could default scot-free	0.669(0.240)**	0.599(0.241)*	0.672(0.234)**	0.701(0.234)***
Failed in the past loan	0.608(0.217)***	0.627(0.216)***	0.628(0.215)***	0.677(0.226)***
Constant	-1.008(0.330)**	-1.027(0.259)***	-0.999(0.264)***	-1.046(0.261)***
Prob > chi2	0.000	0.000	0.003	0.062**
Pseudo R2	0.1886	0.1947	0.1915	0.1916
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

(ii) The values in the bracket is the standard errors

Table 6.7: Probit regression when only 20-30% was diverted across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	-0.528(0.223)**	-0.554(0.225)**	-0.549(0.223)**	-0.571(0.226)**
Hidden information	0.669(0.220)***	0.644(0.218)***	0.690(0.210)***	0.731(0.220)***
Involved in moral hazard	0.568(0.249)**	0.475(0.244)*	0.546(0.248)**	0.509(0.257)*
Judged bank rate as too high	-0.158(0.210)	-0.209(0.211)	-0.154(0.208)	-0.094(0.209)
Collateral pledged 2:1	0.328(0.210)	0.286(0.212)	0.349(0.209)	0.343(0.209)
Considered stringency as weak	0.141(0.214)	0.109(0.217)	0.124(0.215)	0.154(0.214)
Only 20-30% disinvested	1.206(0.329)**	1.256(0.329)**	1.168(0.322)**	1.180(0.326)*
Could default scot-free	0.773(0.245)**	0.701(0.247)***	0.805(0.241)***	0.819(0.240)***
Failed in the past loan	0.608(0.221)***	0.736(0.224)***	0.711(0.220)***	0.758(0.231)***
Constant	-1.114(0.330)**	-1.241(0.268)***	-1.212(0.273)***	-1.276(0.270)***
Prob > chi2	0.000	0.000	0.003	0.062**
Pseudo R2	0.2411	0.2519	0.2426	0.2419
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

(ii) The values in the bracket are the standard errors

Table 6.7 presents the result when amount mis-apportioned was 20-30%. The result showed that with higher disinvestment of the borrowed funds; the likelihood of default is increased. However, for some borrowers in this category, their higher disinvestment level does not amount to default. In fact, some of them when haven secured larger loan size were still able to repay. For most borrowers in this category, it is likely that their subjects of disinvestment were high income-yielding, and enabled them to make repayment. Result from table 6.6, while being similar with table 6.4 in term of the signage of the coefficients, differs only by their magnitudes. The general conclusions from the results showed that borrowers level of mis-investment matters for repayment success. However, a number of borrowers who disinvested some of their borrowed fund were found to be able to make repayment. Where the purposed for which the disinvestment was made is income also revenue-yielding, the size becomes unimportant. The R-square explained the proportion of the total variability of the default that is accounted for by the model. The explanatory variables generally predicted weak occurrence of default based on the explanatory variables identified. What this suggest is that there may be other critical factors causative to asymmetries, such as the institutional factors which are not captured by the study.

Table 6.8: Probit regression when over 30% was diverted across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	-0.506(0.217)**	-0.508(0.216)**	-0.527(0.217)**	-0.541(0.219)**
Hidden information	0.682(0.219)***	0.660(0.218)***	0.675(0.217)***	0.720(0.221)***
Involved in moral hazard	0.444(0.239)**	0.379(0.245)*	0.431(0.239)**	0.385(0.249)*
Judged bank rate as too high	-0.158(0.210)	-0.220(0.204)	-0.194(0.202)	-0.145(0.203)
Collateral pledged 2:1	0.240(0.198)	0.200(0.200)	0.241(0.198)	0.233(0.198)
Considered stringency as weak	0.225(0.205)	0.211(0.207)	0.201(0.207)	0.230(0.206)
Over 30% disinvested	-0.455(0.278)**	-0.436(0.278)***	-0.478(0.280)***	-0.464(0.277)***
Could default scot-free	0.719(0.244)**	0.652(0.244)**	0.724(0.238)**	0.741(0.657)**
Failed in the past loan	0.603(0.214)***	0.621(0.215)***	0.620(0.213)***	0.657(0.221)***
Constant	-0.896(0.341)**	-0.901(0.268)***	-0.855(0.274)***	-0.915(0.270)***
Prob > chi2	0.000	0.000	0.000	0.000
Pseudo R2	0.2411	0.2519	0.2426	0.2419
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

    (ii) The values in the bracket are the standard errors

In table 6.9, attempt was made to estimate the determinant of the default risk under a situation where the different sizes of borrowers all used their loans fully for the purpose for which it was meant. For each of the predictor variables, the responses are ranked in a categorical order. For instance, not fully disclosing information, hiding information, involvement (of the borrower) in moral hazard, judgment on the fairness of the interest rate, stringency of the interest rate, getting scot free and if the borrower had failed in the past loan were ranked ordinal as 1 (representing yes response) and 2 (representing a no response). For most of the questions, the yes response is suggesting of a default occurrence and so was the variable. As introduced for standard probit regressions in Stata 11, the ranks are factor variable which suggests that one of the ranks need be excluded for each of the categorical responses. For those responses having more than two categories, the rank most likely to precipitate default was chosen. For instance, three ranks of collateral groups were contained in the questionnaire, but the ratio 2:1 was chosen because it had the highest frequency and was more likely to precipitate default than higher collateral requirements. In terms of the diagnostics, the results for probit regression are similar to those of logistic regressions. A look at the result across the loan sizes revealed that the R-squared improved as the loan sizes increased (see table 6.9). The R-square explain the proportion of the total variability of the default that is accounted for by the model. The explanatory variables were generally poor predictor of default occurrence, though the predictive power improved as the loan sizes increased. What this suggests is that when not parts of the loan disbursed are diverted, borrowers who secured larger loans would tend to do better.

Table 6.9: Probit regression when no part of the loan was diverted

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	0.316(0.202)	-0.226(0.229)	-0.818(0.399)*	0.210(0.412)
Hidden information	-0.398(0.209)*	0.860(0.253)	-0.451(0.391)	0.775(0.395)*
Involved in moral hazard	-0.160(0.234)	0.343(0.233)***	-0.293(0.434)	---
Judged bank rate as too high	-0.513(0.201)*	0.531(0.237)*	-0.329(0.308)	0.491(0.382)
Collateral pledged 2:1	-0.204(0.190)	0.330(0.218)	0.010(0.308)	-0.078(0.396)
Considered stringency as weak	-0.147(0.201)	0.173(0.227)	-0.354(0.351)	0.590(0.397)
All loans were fully used	0.117(0.382)	-0.386(0.490)	---	1.685(0.629)***
Could default scot-free	-0.712(0.227)**	0.909(0.251)***	-0.432(0.436)	-0.094(0.453)
Failed in the past loan	-0.414(0.209)*	-0.009(0.236)	0.331(0.350)	1.357(0.446)***
Constant	1.262(0.262)***	-1.869(0.312)***	-0.801(0.386)*	-3.117(0.613)***
Prob > chi2	0.0010	0.000	0.1381	0.0038
Pseudo R2	0.1022	0.1752	0.1220	0.2405
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

(ii) The values in the bracket are the standard errors

6.2. (d) Result of the **Chiappori-Salanie Test Statistics**

The results of the Chiappori-Salanie test statistics using equation (14) ware presented in table 6.10 for the various categories of the borrowers. Based on Chiappori and Salanie test statistics (W), the default risk characteristics of the borrower before and after the loan disbursed were presented in the table. The test statistics (W) was used to estimate the residuals of the ex-post and ex-ante default risk characteristics of the borrowers. A Positive value of W implies that the two default risk characteristics differ and implying the presence of information asymmetry. Based on the probit model, default risk variables were expected to relate positively with the loan sizes when information asymmetry exists.This test statistics is based on the idea that adverse selection is likely when borrowers' characteristic before and after a loan is availed differs. The residual from the default likelihood model was then used to estimate W. The computation of the generalised residual of the regression compares the various categories of the loan applied and released to each of the borrowers.

Table:6.10: Chiappori-Salanie test statistics for the various categories

Category	Less than ₦500,000	₦500,000-₦2million	(₦2 – ₦5)million	Above ₦5million
Chiappori-Salanie (W)	181.75	103.08	146.69	113.08

Source: Author's computation

Table 6.10 shows the result of the test statistics for the generalised residuals of the probit models examining the ex-post and ex-ante characteristics of the borrowers. W was observed to be positive for all the categories of the borrowers. The result shows that W=0 can be rejected for all the categories of loan sizes availed to the borrowers. The rejection of W=0 implies that there is evidence that those with ex-post higher risks were adversely selected into the lending pool. With W=0, the test statistics suggests that there is the presence of information asymmetry across all the categories of borrowers. Adverse selection was observed to be highest among borrowers who applied for small loan sizes. The result contrasts with the finding from the correlation test which had predicted higher asymmetry for the larger size borrowers. The high positive values of W across all the categories imply that borrowers' characteristics actually changed after they had secured the loans.

6.2. (e) Default Risks measured from the Banks and Borrowers' Perspective

The preceding illustrations from the probit models (referring to tables 6.5 - 6.9) showed that hidden information[75] was positively related to default incentive. In essence, hidden information was mainly attributed to the occurrence of borrower-advantaged information asymmetry and that of information disclosure attributed to the bank. Based on the correlation tables of 6.2 and 6.3., hidden information and disclosure affect default risks. Essentially, ex-post realisation of asymmetric actions by the borrower, such as unauthorised charges, or deductions from own account by borrowers are contributory factors to loan collapse. In order to test for the relevance of the agents' perspectives in precipitating default, six (6) default variables were considered, with each one representing a default factor from the perspectives of the bank and borrowers respectively. Banks use the collateral requirement as proxy for the effort commitment from the borrowers. Table 6.11 shows the relationship between the representative default variables and the bank/borrowers' characteristics. In actual fact, there was higher influence of bank related asymmetry variables on the general default incidence than that originating from the borrowers. About 41 per cent

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[75] Hidden information is used to refer to the asymmetry arising from the bank while incomplete disclosure is used to refer to the borrower.

of the borrowers confessed of being asymmetric. Of the total, 26 per cent of the borrowers got involved in moral hazard while 39 per cent actually held private information. Of the total loans considered, only about 40 per cent of the borrowers actually succeeded with the loan. 39 per cent of the borrowers hide information from the bank. The purpose of the loan affected about 36 percent of the total loans made.

Table 6.11: Some of the borrowers' profile of default characteristics

Questions /status	Response		
	Yes	No	
Actually succeeded with the loan? (borrower defaulted) Q29	85	125	
Did you hide information (borrower)? (Borrower asymmetry) Q25	82	128	
Involved in moral hazard? (mhazard)	54	156	
Was bank's rate fair? (brate)	118	92	
Does purpose affect the size of the loan? Q23	76	134	
Need to fully disclose information to the bank? Q27	138	72	
Took asymmetric action? Q31	54	156	
Bank screening stringent enough to foreclose default? Q40	112	98	
Can go scot free with the loan? Q56	46	164	
Do you blame banks for loan defaults? Q66	138	72	
Was all bank charges made known before hand? Q12	86	124	
Would you ever take up bank loan again? Q36	82	128	
	High	Moderate	Low
Ratio of collateral committed (e)	28	92	90

Source: Author's Field Survey

Table 6.12 suggests that there is still a large incidence of loan defaults in the industry. From the perspective of the bank, default risks relate inversely with information disclosure. As a result, loans become riskier when information disclosure is incomplete. Asymmetric risks arise because of the uncertainty in the parameters with which the financial decisions of borrowers are made. We attempt to estimate the effect of default risk in the loan market using a set of observable variables which are designated into the perspectives of the banks and the borrowers. The main difference of the estimation form the preceding illustration is that we considered each characteristic in nominal term without recourse to its categorization. For instance, there are various categories of effort (collateral) commitment, loan sizes, duration and interest rates, but these categories were ignored for the estimation. The results from the banks' and borrowers' perspectives are shown in table 6.12. and 6.13 respectively. The result showed that the impacts of the loan size across the loan categories were mixed. Thus, while size is a significant default factor for the very large (and small) borrowers, it matters less for the medium size borrowers. Borrowers' hidden information relates positively across all the categories of borrowers, and the impact increased with the size of the loans. This implication of this is that banks were likely to lose their money as much as their borrowers' information was incomplete. Increase in collateral requirement is an important means of reducing incentives for default risk. However, its importance is dependent on the extent to which it is successful in conditioning borrowers to appropriate effort level. Effort commitments (proxied by the amount of collateral pledged) were likely to reduce default incidence across the various loans sizes respectively.

High effort commitment was insignificant in reducing default risks. By implication, a number of factors are needful to commit borrowers to repayment outside the huge collateral requirement. From the borrowers' perspective, bank information asymmetry (represented as hidden information) and durations of the loan are both positively related to asymmetric risks.

Table 6.12: Probit Estimate from the Bank's Perspective

Asymmetric Risk	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Information disclosure	-0.019(0.199)	-0.042(0.201)	-0.008(0.202)	0.001(0.201)
Interest rate	-0.075(0.122)	-0.076(0.121)	-0.109(0.123)	-0.080(0.121)
Duration	0.816(0.147)***	0.789(0.146)***	0.948(0.157)***	0.839(0.145)***
Effort commitment	-0.161(0.139)	-0.129(0.139)	-0.194(0.137)	-0.166(0.136)
Loan size	-0.072(0.210)	0.384(0.244)	-1.299(0.498)**	0.284(0.380)
Constant	-0.978(0.415)***	-1.110(0.402)**	-1.024(0.400)	-1.067(0.401)**
Prob > chi2	0.000	0.000	0.000	0.000
Pseudo R2	0.168	0.176	196	169
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.
(ii) The values in the bracket are the standard errors

Table 6.13: Probit Estimate from the Borrower's Perspective

Asymmetric Risk	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Hidden Information	0.729(0.207)***	0.688(0.207)***	0.670(0.206)***	0.715(0.206)***
Interest	-0.119(0.127)	-0.108(0.126)	-0.139(0.128)	-0.119(0.127)
Duration	0.743(0.150)***	0.711(0.156)***	0.851(0.168)***	0.743(0.156)***
Effort commitment	-0.225(0.145)	-0.185(0.145)	-0.234(0.141)*	-0.217(0.141)
Loan size	0.041(0.221)	0.245(0.256)	-1.230(0.544)***	0.123(0.385)
Constant	-1.031(0.408)	-1.081(0.396)**	-1.018(0.392)	-0.978(0.415)**
Prob > chi2	0.000	0.000	0.000	0.000
Pseudo R2	0.212	0.215	0.234	0.212
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.
(ii) The values in the bracket are the standard errors

Aside the occurrence of the determining factors, asymmetric risk was very likely to reduce by 67 and 85 percent if hidden information and loan durations were reduced. Borrowers who had failed in the past loans were about 43 percent likely to contribute to the deviation between the expected yield and eventual returns. The low value of the pseudo R2 (=0.233) show a poor model fit. This implies that asymmetric risk may be related to a number of other factors, such as character and determination to repay which are endemic to individual borrowers, and as a result not been captured by the model. Irrespective of the prevalence of the bank-advantaged asymmetry, empirical findings reveals that a reduction in borrower-advantaged asymmetry will reduce default risks than the bank-advantaged asymmetry in the market examined.

As required in all dummy cases, we exclude one category in each of the dummy cases to avoid dummy trap. Thus, the class with highest frequency is excluded, such that the results can be interpreted with respect to the modal category. The correlation results in the appendix do not significantly differ from the regression estimates. Full information disclosure and the ex-post success state of the investment made with the loaned money are key significant determinant of default risks.

The foregoing suggests that the type of information asymmetry could affect the nature of asymmetric risks faced by the agents. Since the bank and the borrower are opposed by differing incentives on sharing the returns from the loan, their perspective to the sources of default risk is likely to differ. Viewed from the perspective of the bank, a borrower is adjudged to be asymmetric if information disclosure was incomplete or some part of the availed fund was disinvested. The borrower in question may have honestly disclosed all required information to the bank, and/or still ensure repayment even with some disinvestment. The divergence between the two perspectives may be as a result of the information seeking criteria of the bank which had limited the extent of information disclosure by the borrowers. Bank's loans assessment criteria are evolved from the history of past borrowers performances and as a result such documents may not be forward looking in terms of being able to capturing all information that the bank may require. Inadequacy of the bank in conditioning borrowers to repayment leads to asymmetric risk.

6.2. (f) Results from the Bank-Borrower Game

The game theory analysis attempts to determine the nature of equilibrium in the loan market. Essentially, the focus is on the extent to which actions are contributed and profits shared between the banks and the borrowers. In order to obtain real life payoffs to each of the agents, we attempt to compute the payoffs of each of the agents based on the prime lending rate at the 2010 (used as the based year). For the sake of simplicity, this baseline lending rate is taken as the uniform rate for all of the loans disbursed. The computation was done on the actual loans repaid and not the total value of the loan disbursed. The detail of the computation of the payoffs is shown in appendix C. In the analysis pursued, focus was on a partial opponent case[76]. The bank and the borrowers' payoffs were not in effect mutually exclusive. The normal forms[77] representation of the bank-borrower lending game were depicted in table 6.14. The normal-form representation of a game specifies: (1) the players in the game, (2) the strategies available to each player, and (3) the payoff received by each player for each combination of strategies chosen by the player (Gibbons, 1992). We let S_i denote the strategy space and u_i denote the payoffs for each player in the game. In effect, the strategy space comprises all the strategies of the players, where i refer to the bank (BR) and borrower (BR). That is, $s_i \in S_i$, $\forall$ $S = (s_{BK}, s_{BR})$. The game is denoted as $G = \{S_1, ...,S_n; u_1,..., u_n\}$. Both players in principle choose their actions independently without full knowledge of the others' choice. We assumed that default is total. Thus, this exclude the probability that a borrower default partially, probably resulting after some initial repayment had been made, or late come back to pay some of the amount on which he had defaulted. Where such was the case, the focus becomes on the actual amount that was paid, and not on the principal.

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[76] The pure-opponent zero-sum case suggests strictly that what one opponent loses the other gains. But in the partially opponent case, both agent though competing for same incentive, are not tied to a strictly mutually exclusive payoff.

[77] A game in its strategic form is also referred to as its normal form. It is essentially a compact way of representing a game in which players simultaneously choose their strategies. The resulting payoffs are presented in a table with a cell for each strategy combination.

Table 6.14: Bank-Borrower Relationship (where collateral value is realizable)

		Borrowers	
		Full disclosure(FD)	Partial Disclosure (PD)
Banks	Full Disclosure (FD)	7288, 14576	-7288+λ, 21864
	Partial Disclosure (PD)	7288+α, 14756-α	**λ+α, -λ+α**

Source: Computed

Note: see table D-1 in the appendix for how the values of the payoffs are computed

Table 6.14 characterize the payoffs of the bank-borrowers lending relationship. λ refers to the value of the collateral pledged which will be foreclosed (by the borrower) to the bank, and α is the monetary value of the information gain (or rent) accruable if the agent is the informationally advantaged. If the collateral pledged λ is fixed and illiquid, recovery of the loan via its disposal becomes cumbersome. If we assume further that the role of collateral requirement is to enforce compliance[78], but not sufficient for recouping loss, such that $\lambda=0$, and information rent only confers the possessor the opportunity to make as extra half of the payoff if both had fully disclosed information. This in essence implies that α will attract ₦3644 for the bank and ₦7288 for the borrower. The emerging outcome shows that the cost of non-cooperative disclosure will be higher for the borrower than the bank compared to when collateral was easily realizable. The weight attached to the collateral by the borrower essentially determines how much he will want to make partial disclosure. For this reason, banks will ensure that valid collaterals are pledged to secure loans. The ensuing outcome can be represented as in the figure below.

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[78] Though many of the loans are realizable in the long run, banks are interested in the short term repayment period. Since bank loans are essentially short term, we focus on the short term payoffs of the bank, since such defaulting loans would have been classified as risk assets, or bad debts when they extend over 6 months. In the long run, $\lambda \neq 0$.

Table 6.15: Bank-Borrower Relationship (where collateral is nil)

		Borrower	
		Full disclosure(FD)	Partial Disclosure (PD)
Bank	Full Disclosure (FD)	7288, 14576	0, 21864
	Partial Disclosure (PD)	10932, 7288	3644, 7288

Source: Computed

Based on Table 6.15, the borrowers' payoffs are rarely affected when bank becomes asymmetric. Thus, borrowers receive same payoffs whenever the part decides to extract hidden charges. But when banks decides to be symmetric (by fully disclosing all charges applicable), borrowers would be strictly better-off by cheating. Banks however would never want to permit such situation, and as a result would be more inclined to cheat. This is the reason why bank lending is characterized by hidden charges.

6.3.f.1 Game in One-Shot and Repeated Interactions

The one-shot analysis of the game derives from the fact that every loans availed is meant to serve a specific purpose. As a result, the considerations of most loans are usually made with respect to the current conditions rather than for future gain. Essentially, small loans fall into the category of short and one-shot games. The outcomes of the game would be different when the game is repeated from the one-shot case. Usually, when players interact over time, threats and promises concerning future behaviour become relevant in affecting current incentives. Nigerians loans are essentially short term oriented. As a result, such loans can be considered as being principally one-shot relation than repeated. With opportunity for rolling over, and funding larger investments, loan interaction could be analyzed as a repeated relationship such that present action derives from the past, while the present also affects the future payoffs. In the following subsection, a one-shot interaction between the two parties is explored, and followed by a repeated analysis.

6.2.f.2 Solution to the Game

Two approaches are common for finding solution to normal form game representations: (1) the Dominant Strategy Approach (DSA) and the Nash Equilibrium Approach (NEA). In principle, banks are assumed as the first player (since they choose the amount of interest rate to charge and whether to attach hidden charges or not outside the offer letter). Using the DSA, PD strictly dominates FD. As a result, banks will not want to play FD at all. Since the borrower is indifferent by the payoffs whenever banks partially disclose information, the dominant strategy equilibrium (DSE) becomes (PD, FD) = (10932, 7288). The banks and the borrowers earn

₦10,932,000 and ₦7,288,000 respectively (see table C-1 in the appendix). Based on the NEA, a two-equilibrium outcome emerges: (PD, FD) and (PD, PD). However, (PD, FD) is strictly preferred to (PD, PD). The implication of the above is that the dominant Nash equilibrium coincides with the Nash equilibrium (DSE=NE). The result from the game analysis essentially shows that the banks have strict positive incentive to be asymmetric. Hence, there is a positive incentive to increase information asymmetry on the part of the banks. This result is strong pointer to the dominant position in the literature which sees the borrowers as the source of asymmetry. For economy where banks are asymmetric, borrowing becomes difficult and so also the use of the banking industry as channel of funding. As an industry, there is higher social benefit on the economy for the bank to make full information disclosure. For instance, when both bank and borrower make full information disclosure to each other, lending will become safer and default rate fall. As in the game, the aggregate returns to the industry equalled ₦21,864,000, compared to when either the bank or borrower chooses to make partial disclosure (which gives payoffs of ₦18,220,000 and ₦10,932,000 respectively). These returns were made from a total loan of N210,500,000, which is the value of the loan covered by the survey (see table D-1 in the appendix) .

6.2.f.3 Pure or Mixed Strategy Equilibrium

Following the solution to the games in section 6.2.f.2, it is not certain for how often the borrower would want to fully disclose information, since he will be indifferent whenever the bank chooses the be asymmetric by partially disclosing information. It would have been expected that banks would consider the social benefit of (FD, FD) to the industry and design its lending contract to ensure repayment. But because it is a non cooperative game, such equilibrium rarely exists. The pure strategy Nash equilibrium (PSNE) of (PD, FD) is sustainable as far as it is a one-shot relationship. The non sustainability of the equilibrium becomes important in repeated games where there is possibility of retaliation. The mixed strategy is best understood in the context of repeated games where each player aims to keep the other guessing and as a result play his pure strategies with certain probabilities. Since bank lending is essentially

short-run, the bank's equilibrium strategy is to offer partial information on every loans made while the borrower is better-off by also making partial information disclose. The penalty on the part of the bank for sustaining the Nash equilibrium is occasionally default. This is common in cases where the payoffs deviate strongly from the expected returns. Nash (1950) had proved that in any n-player game, with finite number of pure strategies (as in our current situation), there must exist at least an equilibrium which is most likely to be a mixed strategy. But this cannot be the case for the banks which is playing first and whose interest is mainly to maximize information gain. It is in view of this that the coexistence of pure and mixed is ruled out[79]. The intuition from the finding suggests the existence of pure-strategy equilibrium in the relationships between the bank and borrowers. This suggestion is made because of the inherent tendency of any losing party to suffer a "loser's curse" type (see e.g., Pesendorfer and Swinkels, 1997; and Holt and Sherman, 1999). With uncertainty about the likelihood of securing the loan, there will be a residual tendency for the borrower to want to overbid in order not to lose the loan (loser's curse effect). By implication, the borrower is presumed will be willing to permit the bank on extracting additional rent from him. On the side of the bank, a failure to correctly anticipate the informational content of the borrower's bid's before acceptance may have caused it to bid below the optimal price, thereby resulting in a "loser's curse." Since the loser's curse produces underbidding, its effect is that arising from bank wanting to cheat on information disclosure to maximize information and balance off the loser's curse bias. Pure strategy provides a complete (unique) definition of how the bank and the borrower would continue to relate. If a mixed strategy is a best response then each of the pure strategies involved in the mix must itself be a best response. In particular, each must yield the same expected payoff. Given the nature of the banking industry and the inherent uncertainty in the process of lending (especially with the quality if borrower and proposed investment), it will be in the best interest of banks to want to play any of its strategies with certainty. The possibility of a pure strategy will be the best option.

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[79] The coexistence of pure and mixed strategy is possible in the chicken game.

CHAPTER SEVEN

SUMMARY, RECOMMENDATION AND CONCLUSION

7.1. Summary

The activities of commercial banks have expanded at a high rate over the past five decades in Nigeria. In terms of numbers and branches, the commercial bank has increased from 8 and 160 on the eve of independence to 24 and 5452 respectively as at 2011. In effect, the assets (loans and advances) and liabilities (deposits) drastically increased over the period. The pattern of growth in the commercial banks' asset over the time reflects a kind of asymmetry traceable to lending actions. Of the main items in the banks liabilities, the deposits rates showed the fastest growth. But when compared with the asset side, loans and advances which dominated the balance sheet. The banks' balance sheet showed a lag between the growth of loan and the deposit liability, which is reflected by inefficiency in the lending activities of the banks. This study examined the impact of information asymmetry on the lending activity of the Nigerian banks over the past two decades. The study linked the occurrence of loan defaults, non-performing loans and financial disequilibrium to the presence of information asymmetry in the bank lending process. The specific work done in the study is summarized as follows.

In chapter two, the details of the developments in the banking sector over the past five decades in terms of the changes that have occurred in the banking structure. This was related to the economic environment with which the operations were being carried out. Specific attention was given on how the consumers' risk characteristics have changed over time and the inefficiencies in the financial system which created avenue for information asymmetry to thrive. The results of the inefficiencies were identified to include loan defaults, non-performing loans and frauds and financial system disequilibrium. The summation from the chapter suggested that many loans made failed despite collateral requirements on them.

In chapter three, we reviewed the existing literature on bank-lender relationship and how relationship banking helps to resolve information asymmetry problems and

provide a role for banks to make loans. Two strands of literatures were reviewed. One strand focused on the use of contract theory analogies to explain the impact of bank-borrower relationship on information asymmetry in a bilateral lending situation. The other emphasized on the use of game theory to characterise the strategic relationships and payoffs that emanates when information possession is unequal. The explanation from each of the strands suggests that contracts must be effectively binding and enforceable. In view of this, bank loans are collateralized as principal means of foreclosing default.

The analytical framework and methodology were presented in chapters four and five. Models conceptualising the presence of information asymmetry and optimal contract were discussed. The methodology was hinged on Chiappori and Salanie test statistics (W), which specified the conditions for the existence of information asymmetry. The methodology was adopted because of its simplicity and direct applicability to lending situations. Probit models were used to typify the impact of information asymmetry variables on lending efficiency. In order to characterize the nature of equilibrium, a game theory methodology was employed to supplement the explanation from the Chiappori-Salanie econometrics.

The results of the study were presented in chapter six. The general trend from the descriptive result showed that 59 per cent of the loans considered in the study succeeded. 46 per cent of the borrowers had settled in their mind that they cannot get away with the bank's loan. 74 per cent claimed to be total honest with the bank and never involved in any moral hazard. 34 per cent claimed to deliberately hidden information from the bank, but as a way of private security. Lending interest rate related positively with default risk, with the chances to increase default by 10.9%. The general incidence showed that most borrowers were fairly honest. The results showed evidence of information asymmetry that was dominated by adverse selection using the correlation test methodology. With the use of the Chiappori-Salanie test statistics, evidence of information asymmetry was supported but varied among the different categories of the borrowers. The discussions made were centred around four categories of borrower sizes: less than ₦500,000; between ₦500,000 and ₦2

million; between ₦2million and ₦5million; and above ₦5million. These classifications served as the basis of examining the effect of each default risk variables on the borrower categories. The use of collateral requirement as a tool of default foreclosure was observed to be fairly effective. The result from the game theory showed the banks having greater incentive to remain asymmetric and perpetuate hidden information. It showed the game has pure strategy equilibrium in a one-shot non-repeated relationship.

The economic implications of information asymmetry were highlighted from the results. Institutional reforms were suggested to reduce loan prices, which is a critical factor responsible for information asymmetry. This is because defaults were likely to be less when the cost of loan falls. The reliance on collateral requirement was suggested to improve lending efficiency only when information was symmetric among financial agents.

7.2   Recommendation

The key insight from the study validates the existence of information asymmetry in the Nigerian commercial bank lending activity. In view of the distorting impacts of information asymmetry in credit markets, the following recommendations are put forward:

1. Financial sector reforms should be directed towards reducing information asymmetries among financial agents. This will help to reduce wrong lending decisions and improve financial intermediation.

2. Actions are encouraged to bring down the price of loans as it related positively with default risks in the various scenarios of lending considered. Borrowers are likely to repay their debts when the interest rate burden is reduced.

3. The study suggests a re-examination of the emphasis placed on collateral requirement by banks as a means of foreclosing default. Since collateralization does not guarantee total repayment, other approaches that are capable of enforcing commitment by borrowers to repay their loans are advocated.

7.3   Conclusion

Attempt made in the study is to validate the existence of information asymmetry using data from 210 commercial bank borrowers from 15 banks in 12 states of Nigeria. The loans considered were made between 2000 and 2012. Efforts were made to provide insights to the extent, size and implications of information asymmetry for lending efficiency and equilibrium. Information asymmetry confers on the advantaged party a monopoly power, with which it could be used to attract rent or precipitate default. The allocation inefficiencies arising from the presence were explored both from the perspective of the bank and the borrower. The lending contracts were observed to be inherently weak, by its inability to compel a self-enforcing fulfilment of the optimal outcome. For banks and the borrowers, the incentive to default arising from drive to private profit were more compelling than the mutual benefits of the contract. For borrowers, the screening criteria were able to reduce information asymmetry especially with respect to collateral requirement. Collateral requirement related inversely with default likelihood and was able to increase the chance of repayment by 23.5 percent. On the side of the borrowers, default was a key retaliation strategy when information was observed to be hidden by the bank. Our models suggest a plausible microeconomic explanation for the sustained high cost of financial intermediation, loan default and lending inefficiency in Nigerian banks.

Information asymmetry has been observed to inhibit lending efficiency as its presence deters banks from making new loans since loans made were likely to default. The existence creates opportunity for defaults, both from the side of the borrowers and the banks. Understanding the pattern and determinants of information asymmetry is important to overcoming the obstacles to lending efficiency in Nigerian banks. In view of the fact that the monetary authority can control the banks than the borrowers, the paper argues for a reform to reduce information asymmetry in the banking industry and indirectly boost lending efficiency. Such reform must be able to enhance the institutional framework for the recovery of loans, and raise penalties for bank related asymmetries. Information asymmetry contributed to the

inefficiency in banks' lending activities. It is important that financial and monetary authorities work together to reduce information asymmetry problems.

7.4 Limitation to the Study

Data constraint was a major problem faced in the study. This arose from two main factors. First, developing countries such as Nigeria have very poor data keeping and management record. For instance, it was difficult to obtain information from the banks about all the loans over the years. For those banks that kept such information at the branch levels, they were strongly unwilling to avail such information to an outsider. It was so difficult that accessing the credit guideline of some of the bank was a near impossibility. To most banks, the credit guideline and policy was a document to be kept secret. It was for these reasons that the data on the consumers' default characteristics were primarily sourced. Secondly, individual borrowers and bank customers were reluctant in disclosing information about their experience with the bank loans. The individuals' see loan experiences and performances as private information which cannot be disclosed to an outsiders. These challenges seriously limited the size and distribution of the survey, was a motivation for the use of purposive sampling method which had been criticised for the high susceptibility to researcher bias. In purposive sampling, each sample is based entirely on the judgment of the researcher in question, who generally is trying to prove a specific point.

Information asymmetry could derive from either the demand or the supply side. The borrowers represent the demand side, while the banks form the supplier. Difficulty in obtaining adequate information on the involvement of the banks information asymmetry made the analyses in the study focused mainly on the demand side. While some of the borrowers' interviews reported the banks as being asymmetric in their loan experiences, the banks generally pointed to the borrowers as the source of asymmetry. Difficulty in data collection from the supply side was a major limitation to the study.

7.5   Suggestion for Future Research

Attempt made in the study to validate the presence of information asymmetry in Nigeria. But the study was limited in scope by focusing only on the loans originating from the commercial banks alone. A consideration of loans originating from other institutions in the credit market, such as the mortgage and microfinance banks may show a different dimension of the patterns of information asymmetry in bank-borrower lending relationships. Given the facts that mortgage loans are mostly meant for consumption, the result from such study may provide interesting insight to understanding the impact of information asymmetry such section of the financial market. The focus of the study has been towards loans meant for investment oriented purposes. As a result, consumer loans, such as auto and mortgage loans are left for another study. There is a general impression that information asymmetry and default incidence may be more prevalent in consumer than investment loans. An investigation into the size of the consumer related loans will give a fuller picture of the size of the banking sector lending asymmetry. Having known that bridging information gap between banks and their borrowers is costly, there is need to investigate further the benefits of improving information collection, evaluation, and monitoring systems against the costs in the industry. Such studies should be able to establish the extent to which reduction in information asymmetry will be economically desirable. In gathering of the data, the main challenge faced was that people were reluctant to give revealing information even while they were assured of the safety of the information. A country with appropriate database of the borrowers and their performances may give different result from what is obtained in this study.

Game theory was used in the study because of the strategic nature of bank-borrower relationship within the context of lending as a long-run repeated action. For borrowers whose lending is a one short experience, the analogy of the relationship as a one-shot game could give an enriching result. The orientation of the study towards long run perspective is because most of the loans in the consideration were for

investment purpose. Bank-borrower relationships under such situation can at best be characterized as long run.

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APPENDIX A: Estimates of the Features of the Commercial Banks

Table A-1: Periodic Commercial Banks Deposits between 1960 and 2010 in real values (₦ million)

Years	Demand	Time	Savings	Total	Demand	Time	Savings	Demand	Time	Savings
1960	587.1	127.9	263.6	978.6	428.6	93.6	192.1	---	---	---
1965	619.5	303.5	401.5	1324.5	234	11.45	151.5	253.5	1195.5	588
1970	1252.6	900.0	563.9	2716.5	200.4	143.9	90.4	576.1	1047.8	267.4
1960-70 (Average)	697.9	389.8	370.0	1457.7	252.1	140.5	133.7	322.6	1651.1	476.3
1975	3167.0	2627.8	1303.3	7098.0	111.5	92.5	46.0	2138.5	3298.3	1603.8
1980	5909.6	4358.2	1938.4	12206.2	59.0	43.5	19.4	344.5	292.7	249.9
1970-80 (Average)	3900.2	2602.4	1638.7	8141.3	106.4	71.1	44.7	2719.1	3291.8	2108.7
1985	3728.1	3624.9	1957.6	9310.6	21.2	20.6	11.1	159.5	256.6	212.5
1990	2759.1	1800.9	2303.3	6863.2	7.1	4.6	5.9	21.5	8.6	44.5
1980-90 (Average)	3202.3	2865.5	1947.5	8015.4	16.5	14.8	10.0	141.1	203.3	222.8
1995	2019.6	761.5	1579.0	4360.1	1.2	0.4	0.9	23.5	8.4	31.0
2000	4982.0	2229.7	2377.2	9588.9	0.8	0.3	0.4	4.8	6.0	2.4
1990-2000 (Average)	2948.9	1347.2	1877.8	6173.9	1.3	0.6	0.8	35.3	16.7	37.1
2005	6591.3	3474.1	2799.0	12864.4	0.4	0.2	0.2	5.5	6.4	3.4
2010	17789.5	14497.7	6731.5	39018.8	0.2	0.2	0.1	1.4	2.4	1.2
2000-2010 (Average)	11658.6	7948.7	4220.4	23827.7	48.9	33.4	17.7	295.4	490.0	124.8

Source: CBN statistical Bulletin (Various Issues)

(1) All figures deflated by the consumer price index, CPI (2003=100)

Table A-2: Real Trends of Commercial Banks Loans and Deposits between 1960 and 2010 (₦ million)

Country	cpi	real total loan	real total deposits	growth in loans	growth in deposits
1960	0.14	813.6	978.6	---	---
1961	0.15	800.0	1025.3	-1.67	4.78
1962	0.15	1028.0	1158.7	28.50	13.00
1963	0.2	894.5	959.0	-12.99	-17.23
1964	0.2	1224.5	1151.0	36.89	20.02
1965	0.2	1350.0	1324.5	10.25	15.07
1966	0.21	1419.5	1414.8	5.15	6.81
1967	0.21	1309.0	1157.6	-7.78	-18.18
1968	0.22	1025.5	1501.8	-21.66	29.73
1969	0.22	998.6	1822.3	-2.62	21.34
1970	0.23	1528.3	2716.5	53.03	49.07
1971	0.23	2182.6	2857.0	42.82	5.17
1972	0.25	2478.0	3978.4	13.53	39.25
1973	0.26	2898.1	3896.2	16.95	-2.07
1974	0.3	3127.0	5646.3	7.90	44.92
1975	0.4	3593.8	7098.0	14.93	25.71
1976	0.48	4422.9	8675.4	23.07	22.22
1977	0.59	7311.0	6627.5	65.30	-23.61
1978	0.67	6141.6	7914.3	-15.99	19.42
1979	0.74	6257.3	9415.9	1.88	18.97
1980	0.82	7742.8	12206.2	23.74	29.63
1981	0.99	8669.6	10784.7	11.97	-11.65
1982	1.06	9693.7	11330.1	11.81	5.06
1983	1.31	8468.6	10640.1	-12.64	-6.09
1984	1.84	6252.0	8551.4	-26.18	-19.63
1985	1.89	6439.3	9310.6	3.00	8.88
1986	2.03	7734.8	8934.8	20.12	-4.04
1987	2.24	7826.7	10306.6	1.19	15.35
1988	3.5	5588.9	8304.3	-28.59	-19.43
1989	5.26	4184.0	5164.4	-25.14	-37.81
1990	5.65	4601.8	6863.2	9.98	32.89
1991	6.37	4914.6	8227.4	6.80	19.88
1992	9.23	4630.2	8126.8	-5.79	-1.22
1993	14.5	4528.6	7602.3	-2.19	-6.45
1994	22.77	4136.3	6185.3	-8.66	-18.64
1995	39.35	3673.9	4337.6	-11.18	-29.87
1996	50.88	3330.1	4101.4	-9.36	-5.45

1997	56.31	6846.9	4694.4	105.61	14.46
1998	60.74	4492.8	5019.6	-34.38	6.93
1999	64.76	4984.0	6805.6	10.93	35.58
2000	69.25	7340.1	9588.9	47.27	40.90
2001	82.32	9671.6	10932.8	31.76	14.01
2002	92.93	10272.6	11278.1	6.21	3.16
2003	105.96	11419.7	11463.8	11.17	1.65
2004	121.87	12466.1	12212.6	9.16	6.53
2005	143.62	13763.5	12864.4	10.41	5.34
2006	155.45	16238.6	18928.8	17.98	47.14
2007	163.82	29382.8	27634.4	80.94	45.99
2008	182.8	37667.4	38490.5	28.20	39.28
2009	196.13	44826.4	42705.4	19.01	10.95
2010	210.336	49424.8	47974.7	10.26	12.34

Source: CBN statistical Bulletin (Various Issues)
All figures deflated by the consumer price index, CPI (2003=100)

Table A-3: Loan-deposit gaps between 1960 and 2010 in real values (₦ million)

Years	Total Deposits	Total Loans	Growth in total deposits	Growth in total loans	Deposit-Loan Gap
1960	978.6	813.6			165.0
1965	1324.5	1350	35.35	65.94	-25.5
1970	2716.5	1528.3	105.10	13.20	1188.3
1960-70 (Average)	1457.7	1126.5	48.96	38.46	331.2
1975	7098.0	3593.8	386.94	219.02	3504.3
1980	12206.2	7742.8	71.97	115.45	4463.4
1970-80 (Average)	8141.3	4334.9	458.51	284.81	3806.4
1985	9310.6	6439.3	14.36	48.54	2871.4
1990	6863.2	4601.8	-26.29	-28.54	2261.5
1980-90 (Average)	8015.4	7018.4	-1.55	61.90	997.0
1995	4360.1	3673.9	-45.60	-47.65	686.2
2000	9588.9	7340.1	119.92	99.79	2248.8
Average (1990-2000)	6173.9	4861.8	-22.97	-30.73	1312.1
2005	12864.4	13763.5	108.37	183.09	-899.1
2010	39018.8	49424.8	203.31	259.10	-10406.1
2010-2010	23828	22043	285.94	353.40	1784.5

Source: CBN statistical Bulletin (Various Issues)

All figures deflated by the consumer price index, CPI (2003=100)

Table A-4: Analysis of Commercial bank Loans and Advances between 1960 and 2010 in real terms (₦ million)

Years	Agric., Forestry & Fishing	Manufac-turing	Mining and Quarrying	Real Estate& Constr.	Bills Discounted	Domestic trade	Exports	Imports	Public Utilities	Transport & comm.	Credit & financial Institutions	Govern-ments	Personal & Prof.	Miscell-aneous	Total
1960	160.7	34.3	7.9	51.4	17.9	300.0	0.0	0.0	7.9	0.0	42.1	15.0	0.0	176.4	813.6
1961	168.0	44.0	6.0	74.0	14.7	259.3	0.0	0.0	1.3	0.0	32.7	11.3	0.0	188.7	800.0
1962	240.7	78.0	7.3	69.3	41.3	370.0	0.0	0.0	2.7	0.0	11.3	10.0	0.0	197.3	1028.
1963	196.5	89.5	6.0	64.5	74.0	307.0	0.0	0.0	10.0	0.0	13.0	7.0	0.0	127.0	894.5
1964	302.0	131.5	6.0	57.5	150.5	334.5	0.0	0.0	8.0	0.0	36.5	9.5	0.0	188.5	1224.
1965	341.5	145.0	6.5	64.5	210.5	288.5	0.0	0.0	16.5	0.0	16.0	10.0	0.0	251.0	1350.
1966	22.9	186.2	7.1	121.4	286.2	0.0	314.3	272.4	5.7	49.0	36.2	6.2	26.7	85.2	1419.
1967	17.6	188.6	9.5	106.7	172.9	0.0	306.2	305.7	16.7	41.4	43.3	8.1	34.8	57.6	1309.
1968	17.3	168.2	5.5	89.5	23.2	0.0	262.7	249.5	10.9	41.8	41.4	13.2	32.7	69.5	1025.
1969	19.5	190.5	14.1	80.5	20.5	0.0	304.1	146.4	7.7	44.5	21.4	22.3	52.3	75.0	998.6
1970	30.4	332.2	28.7	113.0	25.7	140.0	302.2	260.4	3.0	82.6	11.7	5.7	101.3	91.3	1528.
1971	40.4	520.4	50.4	162.6	43.5	245.2	398.7	274.3	15.7	138.3	25.2	15.7	143.9	108.3	2182.
1972	76.8	576.0	40.8	196.8	32.0	294.8	361.2	200.8	20.8	177.6	56.8	36.0	247.6	160.0	2478.
1973	83.1	24.2	700.8	294.6	13.8	326.5	340.8	353.8	42.7	198.8	45.4	67.7	165.4	248.1	2905.
1974	90.7	861.7	40.7	326.0	46.7	327.0	305.7	270.3	24.3	219.7	72.0	105.7	208.0	228.7	3127.
1975	93.5	1026.8	40.8	532.0	70.5	360.8	251.5	326.5	42.8	205.0	129.0	93.3	212.0	209.5	3593.
1976	165.8	1268.8	30.4	859.0	49.6	437.7	201.0	417.9	44.8	376.5	106.5	117.5	205.2	142.3	4422.
1977	235.8	1420.0	63.9	1122.0	40.3	504.2	173.6	489.2	77.5	395.9	162.0	148.8	2333.2	145.1	7311.
1978	341.8	1698.5	58.8	1317.8	59.3	610.6	120.6	506.1	93.0	424.6	225.1	196.3	304.3	184.9	6141.
1979	445.4	1834.2	59.5	1429.1	85.9	598.1	105.8	377.3	77.2	452.0	109.9	225.0	269.2	188.9	6257.
1980	563.7	2386.3	62.1	1616.3	32.4	773.9	122.2	546.2	107.3	592.0	252.2	195.5	271.1	221.6	7742.
1981	596.6	2686.7	88.9	1768.2	0.0	835.9	108.2	545.9	179.0	616.5	364.4	310.0	326.5	241.0	8667.
1982	742.1	2865.7	89.0	1967.0	0.0	1030.7	142.0	550.7	182.2	667.0	379.9	347.3	0.0	730.6	9693.
1983	717.9	2330.6	90.6	1725.3	0.0	814.2	105.1	399.2	138.4	548.2	618.4	449.6	0.0	531.1	8468.
1984	571.8	1675.8	89.9	1290.1	0.0	650.9	72.6	267.1	109.0	401.4	409.3	315.0	0.0	398.9	6251.
1985	693.2	1710.2	124.9	1319.4	0.0	750.1	64.9	270.4	129.1	393.5	284.8	292.4	0.0	406.5	6439.
1986	803.1	2204.5	102.5	1399.2	0.0	849.8	153.4	353.8	119.3	359.8	405.5	253.6	0.0	631.8	7636.
1987	1083.5	2214.8	110.0	1291.3	0.0	875.8	206.5	273.8	103.7	357.6	492.0	287.3	250.5	280.1	7826.
1988	876.2	1736.6	64.9	859.4	0.0	667.3	136.5	229.3	73.7	253.1	54.9	221.3	242.1	173.4	5588.
1989	659.8	1268.4	51.6	613.4	0.0	520.2	114.7	167.8	38.1	156.2	91.0	160.0	218.8	123.9	4184.
1990	747.2	1395.3	64.1	568.3	54.5	488.8	132.2	180.8	38.1	165.6	127.3	205.1	235.8	198.6	4601.
1991	786.9	1712.9	85.1	560.9	19.2	476.5	148.0	157.2	34.1	178.1	118.7	156.6	264.2	216.3	4914.
1992	756.1	1668.9	82.3	439.8	79.0	402.3	142.7	177.0	33.4	144.8	121.1	134.3	236.0	212.4	4630.
1993	741.6	1593.8	98.2	372.8	0.0	687.1	110.9	132.6	32.2	148.3	124.2	120.0	0.0	366.8	4528.
1994	785.6	1729.9	78.6	0.0	0.0	0.0	388.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2982.

1995	642.4	1476.3	306.8	0.0	0.0	0.0	494.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2919.
1996	653.8	1419.8	295.8	0.0	0.0	0.0	648.5	0.0	0.0	0.0	0.0	0.0	0.0	312.2	3330.
1997	496.2	1470.8	366.0	0.0	0.0	0.0	290.7	0.0	0.0	0.0	0.0	0.0	0.0	4223.2	6846.
1998	447.5	1592.6	376.2	0.0	0.0	0.0	490.1	0.0	0.0	0.0	0.0	0.0	0.0	1586.5	4492.
1999	1830.1	6726.1	1744.8	0.0	0.0	0.0	1182.4	0.0	0.0	0.0	0.0	0.0	0.0	8066.1	19549
2000	2028.9	7490.9	1922.6	0.0	0.0	0.0	1416.8	0.0	0.0	0.0	0.0	0.0	0.0	12842.8	25702
2001	2439.9	8719.5	2699.6	0.0	0.0	0.0	1401.9	0.0	0.0	0.0	0.0	0.0	0.0	18705.5	33960
2002	2449.3	9556.5	3068.8	0.0	0.0	0.0	1202.7	0.0	0.0	0.0	0.0	0.0	0.0	22420.9	38698
2003	2285.6	9415.6	3107.1	0.0	0.0	0.0	1291.3	0.0	0.0	0.0	0.0	0.0	0.0	24854.0	40953
2004	2146.2	10739.6	4245.2	0.0	0.0	0.0	1021.0	0.0	0.0	0.0	0.0	0.0	0.0	28510.2	46662
2005	1824.3	9698.1	4289.9	0.0	0.0	0.0	886.9	0.0	0.0	0.0	0.0	0.0	0.0	35303.7	52002
2006	317.7	2867.8	1617.7	0.0	0.0	0.0	338.9	0.0	0.0	0.0	0.0	0.0	0.0	11096.5	16238
2007	913.1	2596.0	2074.1	0.0	0.0	0.0	310.5	0.0	0.0	0.0	0.0	0.0	0.0	18212.6	24100
2008	645.1	3970.8	3390.6	2422.7	0.0	0.0	438.2	744.3	0.0	5376.6	2371.5	0.0	0.0	13764.2	33123
2009	961.2	4142.1	3936.2	3303.1	0.0	0.0	493.5	1197.5	0.0	5816.7	2607.5	0.0	0.0	17379.2	39837
2010	916.2	4528.1	4545.9	4054.5	0.0	0.0	579.3	1586.3	0.0	6175.1	2801.8	0.0	0.0	17206.1	42393

Source: CBN statistical Bulletin (Various Issues)
All figures deflated by the consumer price index, CPI (2003=100)

Table A-5: Analysis of Commercial bank Loans and Advances between 1960 and 2010 in percentage (₦ million)

Years	Agric., Forestry &Fishing	Manufa-cturing	Mining & Quarrying	Real Estate& Const.	Bills Discounted	Domestic trade	Exports	Imports	Public Utilities	Transport& communication.	Credit& fin. Institutions	Govts.	Personal& Professional.	Miscellaneous
1960	0.20	0.04	0.01	0.06	0.02	0.37	0.00	0.00	0.01	0.00	0.05	0.02	0.00	0.22
1961	0.21	0.06	0.01	0.09	0.02	0.32	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.24
1962	0.23	0.08	0.01	0.07	0.04	0.36	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.19
1963	0.22	0.10	0.01	0.07	0.08	0.34	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.14
1964	0.25	0.11	0.00	0.05	0.12	0.27	0.00	0.00	0.01	0.00	0.03	0.01	0.00	0.15
1965	0.25	0.11	0.00	0.05	0.16	0.21	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.19
1966	0.02	0.13	0.01	0.09	0.20	0.00	0.22	0.19	0.00	0.03	0.03	0.00	0.02	0.06
1967	0.01	0.14	0.01	0.08	0.13	0.00	0.23	0.23	0.01	0.03	0.03	0.01	0.03	0.04
1968	0.02	0.16	0.01	0.09	0.02	0.00	0.26	0.24	0.01	0.04	0.04	0.01	0.03	0.07
1969	0.02	0.19	0.01	0.08	0.02	0.00	0.30	0.15	0.01	0.04	0.02	0.02	0.05	0.08
1970	0.02	0.22	0.02	0.07	0.02	0.09	0.20	0.17	0.00	0.05	0.01	0.00	0.07	0.06
1971	0.02	0.24	0.02	0.07	0.02	0.11	0.18	0.13	0.01	0.06	0.01	0.01	0.07	0.05
1972	0.03	0.23	0.02	0.08	0.01	0.12	0.15	0.08	0.01	0.07	0.02	0.01	0.10	0.06
1973	0.03	0.01	0.24	0.10	0.00	0.11	0.12	0.12	0.01	0.07	0.02	0.02	0.06	0.09
1974	0.03	0.28	0.01	0.10	0.01	0.10	0.10	0.09	0.01	0.07	0.02	0.03	0.07	0.07
1975	0.03	0.29	0.01	0.15	0.02	0.10	0.07	0.09	0.01	0.06	0.04	0.03	0.06	0.06
1976	0.04	0.29	0.01	0.19	0.01	0.10	0.05	0.09	0.01	0.09	0.02	0.03	0.05	0.03
1977	0.03	0.19	0.01	0.15	0.01	0.07	0.02	0.07	0.01	0.05	0.02	0.02	0.32	0.02
1978	0.06	0.28	0.01	0.21	0.01	0.10	0.02	0.08	0.02	0.07	0.04	0.03	0.05	0.03
1979	0.07	0.29	0.01	0.23	0.01	0.10	0.02	0.06	0.01	0.07	0.02	0.04	0.04	0.03
1980	0.07	0.31	0.01	0.21	0.00	0.10	0.02	0.07	0.01	0.08	0.03	0.03	0.04	0.03
1981	0.07	0.31	0.01	0.20	0.00	0.10	0.01	0.06	0.02	0.07	0.04	0.04	0.04	0.03
1982	0.08	0.30	0.01	0.20	0.00	0.11	0.01	0.06	0.02	0.07	0.04	0.04	0.00	0.08
1983	0.08	0.28	0.01	0.20	0.00	0.10	0.01	0.05	0.02	0.06	0.07	0.05	0.00	0.06
1984	0.09	0.27	0.01	0.21	0.00	0.10	0.01	0.04	0.02	0.06	0.07	0.05	0.00	0.06
1985	0.11	0.27	0.02	0.20	0.00	0.12	0.01	0.04	0.02	0.06	0.04	0.05	0.00	0.06
1986	0.11	0.29	0.01	0.18	0.00	0.11	0.02	0.05	0.02	0.05	0.05	0.03	0.00	0.08
1987	0.14	0.28	0.01	0.16	0.00	0.11	0.03	0.03	0.01	0.05	0.06	0.04	0.03	0.04
1988	0.16	0.31	0.01	0.15	0.00	0.12	0.02	0.04	0.01	0.05	0.01	0.04	0.04	0.03
1989	0.16	0.30	0.01	0.15	0.00	0.12	0.03	0.04	0.01	0.04	0.02	0.04	0.05	0.03
1990	0.16	0.30	0.01	0.12	0.01	0.11	0.03	0.04	0.01	0.04	0.03	0.04	0.05	0.04
1991	0.16	0.35	0.02	0.11	0.00	0.10	0.03	0.03	0.01	0.04	0.02	0.03	0.05	0.04
1992	0.16	0.36	0.02	0.09	0.02	0.09	0.03	0.04	0.01	0.03	0.03	0.03	0.05	0.05
1993	0.16	0.35	0.02	0.08	0.00	0.15	0.02	0.03	0.01	0.03	0.03	0.03	0.00	0.08
1994	0.26	0.58	0.03	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	0.22	0.51	0.11	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Year														
1996	0.20	0.43	0.09	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.09
1997	0.07	0.21	0.05	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.62
1998	0.10	0.35	0.08	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.35
1999	0.09	0.34	0.09	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.41
2000	0.08	0.29	0.07	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2001	0.07	0.26	0.08	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.55
2002	0.06	0.25	0.08	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.58
2003	0.06	0.23	0.08	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.61
2004	0.05	0.23	0.09	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.61
2005	0.04	0.19	0.08	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.68
2006	0.02	0.18	0.10	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.68
2007	0.04	0.11	0.09	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.76
2008	0.02	0.12	0.10	0.07	0.00	0.00	0.01	0.02	0.00	0.16	0.07	0.00	0.00	0.42
2009	0.02	0.10	0.10	0.08	0.00	0.00	0.01	0.03	0.00	0.15	0.07	0.00	0.00	0.44
2010	0.02	0.11	0.11	0.10	0.00	0.00	0.01	0.04	0.00	0.15	0.07	0.00	0.00	0.41

Source: CBN statistical Bulletin (Various Issues)
All figures deflated by the consumer price index, CPI (2003=100)

Table A-6: Analysis of Commercial bank Loans and Advances to the various broad sector of the economy between 1960 and 2010 (₦ million)

Years	production	General Commerce	Services	others
1960	0.313	0.391	0.061	0.235
1961	0.365	0.343	0.043	0.250
1962	0.385	0.400	0.014	0.202
1963	0.399	0.426	0.026	0.150
1964	0.406	0.396	0.036	0.162
1965	0.413	0.370	0.024	0.193
1966	0.238	0.615	0.064	0.083
1967	0.246	0.599	0.077	0.077
1968	0.273	0.522	0.092	0.113
1969	0.305	0.472	0.074	0.150
1970	0.330	0.477	0.064	0.130
1971	0.355	0.441	0.082	0.123
1972	0.359	0.359	0.103	0.179
1973	0.379	0.356	0.099	0.166
1974	0.422	0.304	0.101	0.173
1975	0.471	0.281	0.105	0.143
1976	0.525	0.250	0.119	0.105
1977	0.389	0.165	0.087	0.359
1978	0.556	0.211	0.121	0.112
1979	0.602	0.187	0.102	0.109
1980	0.598	0.190	0.123	0.089
1981	0.593	0.172	0.134	0.101
1982	0.584	0.178	0.127	0.111
1983	0.574	0.156	0.154	0.116
1984	0.580	0.158	0.147	0.114
1985	0.598	0.169	0.125	0.109
1986	0.591	0.178	0.116	0.116
1987	0.600	0.173	0.122	0.105
1988	0.633	0.185	0.068	0.114
1989	0.620	0.192	0.068	0.120
1990	0.603	0.186	0.072	0.139
1991	0.640	0.163	0.067	0.130
1992	0.637	0.173	0.065	0.126
1993	0.620	0.205	0.067	0.107
1994	0.870	0.130	0.000	0.000
1995	0.831	0.169	0.000	0.000
1996	0.711	0.195	0.000	0.094

1997	0.341	0.042	0.000	0.617
1998	0.538	0.109	0.000	0.353
1999	0.527	0.060	0.000	0.413
2000	0.445	0.055	0.000	0.500
2001	0.408	0.041	0.000	0.551
2002	0.390	0.031	0.000	0.579
2003	0.362	0.032	0.000	0.607
2004	0.367	0.022	0.000	0.611
2005	0.304	0.017	0.000	0.679
2006	0.296	0.021	0.000	0.683
2007	0.232	0.013	0.000	0.756
2008	0.315	0.036	0.234	0.416
2009	0.310	0.042	0.211	0.436
2010	0.331	0.051	0.212	0.406

Source: table A-5.

Table A-7: Result of the Sectoral Decomposition of commercial bank loans and advances (1960-2010)

Year (t, t+1)	Decomposition Measure	Year (t, t+1)	Decomposition Measure
t=1,1960/61	2364.90	t=40,1999/2000	83885.19
t=2,1961/62	2319.57	t=41,2000/01	113340.92
t=3,1962/63	3093.32	t=42,2001/02	153898.91
t=4,1963/64	2637.24	t=43,2002/03	177531.19
t=5,1964/65	3778.12	t=44,2003/04	188885.32
t=6,1965/66	4222.82	t=45,2004/05	217859.33
t=7,1966/67	4471.39	t=46,2005/06	245242.35
t=8,1967/68	4077.13	t=47,2006/07	68369.42
t=9,1968/69	3084.55	t=48,2007/08	105631.86
t=10,1969/70	2992.32	t=49,2008/09	149720.10
t=11,1970/71	4863.10	t=50,2009/10	183256.95
t=12, 1971/72	7284.34		
t=13,1972/73	8407.19		
t=14,1973/74	10059.97		
t=15,1974/75	10925.77		
t=16,1975/76	12774.19		
t=17,1976/77	16121.02		
t=18,1977/78	28247.93		
t=19,1978/79	23262.50		
t=20,1979/80	23751.90		
t=21,1980/81	30107.09		
t=22,1981/82	34128.09		
t=23,1982/83	38640.59		
t=24,1983/84	33259.25		
t=25,1984/85	23728.27		
t=26,1985/86	24522.27		
t=27,1986/87	29646.57		
t=28,1987/88	30470.16		
t=29,1988/89	20939.39		
t=30,1989/90	15149.09		
t=31,1990/91	16852.49		
t=32,1991/92	18138.7		
t=33,1992/93	16968.42		
t=34,1993/94	16552.83		
t=35,1994/95	10360.65		
t=36,1995/96	10113.68		
t=37,1996/97	11726.72		
t=38,1997/98	26257.55		
t=39,1998/99	16406.53		

Source: Tables A-4 and A-5

Table A-8: Changes in the structure of Commercial Banks in Nigeria

Years	Number of Banks	% Growth rate	Number of Branches resident in Nigeria	% Growth rate
1960	12	-	158	-
1965	15	25	223	41.1
1970	14	-6.7	270	21.1
1975	17	21.4	432	60
1980	20	17.6	733	69.7
1985	28	40.0	1290	76.0
1990	58	107.1	1934	49.9
1995	64	10.3	2360	22.0
2000	54	-15.6	2188	-7.3
2001i	90	66.7	2188	00
2005ii	25	-72.2	3535	61.6
2010	24	-4.0	5809	64.0
2011	24	0	5454	-6.11
2012	20	-16.7	5564	2.02
2013	24	20	5639	1.33

[i]Universal banking started in 2001

[ii] A number of defunct branches emerged after the recapitalization. Thus, official record was not made for the year.

Source: Central Bank Statistical Bulletin (various issues)

Table A-9: Cross correlations between some banking policy variables

Cross correlations	Inflation rate	Lending rate	Loan Disbursement rate	Loan-to-Deposit Ratio
Average Monetary Policy rates:				
(1970-79)	-0.50	0.90	-0.67	0.76
(1980-89)	0.47	0.97	-0.51	0.05
(1990-2000)	0.21	0.22	-0.05	-0.67
(2001-2010)	0.27	0.74	-0.20	-0.66
(1970-2010)	0.33	0.85	-0.07	-0.16
Lending rates: (1970-79)	-0.72	1	-0.69	0.77
(1980-89)	0.53	1	-0.42	0.10
(1990-2000)	0.18	1	-0.41	-0.25
(2001-2010)	0.26	1	-0.42	-0.12
(1970-2010)	0.29	1	-0.12	-0.01

Source: Computed from Central Bank's Statistical Bulletin (various years)

Table A-10: Growth of some selected financial variables

Year	Growth in MPR	Growth in Lending rate	Growth in inflation rate	Growth in Banks' Loans	Growth in Loan-deposit ratio
1970	0.00	0.00	30.77	59.99	-78.75
1971	0.00	0.00	51.67	42.82	24.78
1972	0.00	0.00	9.43	23.41	8.09
1973	0.00	0.00	83.99	21.63	-6.30
1974	0.00	0.00	-94.85	24.50	-13.31
1975	-12.50	-16.67	78.10	53.24	-20.55
1976	-14.29	0.00	-258.75	47.69	-5.80
1977	12.50	0.00	61.24	103.18	8.87
1978	20.00	14.29	-405.99	-4.60	22.74
1979	0.00	6.67	25.63	12.53	2.42
1980	16.67	0.00	48.42	37.12	-5.40
1981	0.00	3.23	7.41	35.18	10.47
1982	25.00	24.39	-150.72	19.72	11.94
1983	0.00	-2.50	82.10	7.97	-0.95
1984	20.00	20.00	-71.32	3.69	-2.32
1985	0.00	-35.14	-2097.09	5.79	-22.42
1986	0.00	11.90	92.47	29.02	19.59
1987	21.57	40.00	-41.07	11.66	-14.13
1988	0.00	-6.06	84.17	11.57	-8.97
1989	31.08	38.43	-37.03	12.51	16.79
1990	0.00	-5.10	-1137.40	18.14	-20.90
1991	-27.59	-27.44	84.28	20.41	-11.20
1992	17.14	32.85	52.95	36.51	-8.33
1993	32.69	-62.66	20.34	53.65	-28.67
1994	-92.59	12.76	20.19	43.43	29.56
1995	0.00	-4.06	-48.79	53.50	16.92
1996	0.00	-2.23	-260.52	17.20	-0.55
1997	0.00	-45.79	-40.16	127.55	4.83
1998	5.66	25.97	14.27	-29.22	-2.96
1999	20.50	14.21	-5313.64	18.27	-36.26
2000	-33.33	-18.58	98.49	57.48	-7.06
2001	5.66	1.69	11.89	56.63	22.26
2002	24.68	26.40	-35.83	19.90	-4.46

2003	-20.63	-19.99	49.08	26.75	-1.45
2004	-5.00	-7.98	-138.16	25.55	9.77
2005	-15.38	-6.85	13.48	30.11	3.11
2006	-6.12	-4.00	-35.01	27.70	-11.32
2007	-32.43	-1.89	-30.64	90.69	10.17
2008	5.13	-6.27	56.56	43.05	12.48
2009	-31.05	14.39	-8.63	27.68	5.60
2010	-22.77	-5.86	-17.80	18.24	-15.50

Source: computed from CBN Statistical Bulletin (various years)

Table A-11: Ownership Structure of Commercial Banks (1992-2010)

Years	Privately Owned	Government Owned	Foreign	Total
1992	33	8	25	66
1995	34	13	17	64
2000	76	1	10	65
2001	77	1	11	89
2005	77	1	11	89
2006	21	0	4	25
2010	20	0	4	24

Table A-12: The Emerged 24 Banks after the Consolidation Exercise in 2005/07

S/N	Bank Name	Members of the Group
1	Access Bank Plc	Marina Bank, Capital Bank International, Access Bank
2	Afribank Plc	Afribank Plc, Afribank International Ltd (Merchant Bankers), Assurance Bank of Nigeria, Lead Bank,
3	Diamond Bank Plc	Diamond Bank, Lion Bank, African International Bank (AIB)
4	EcoBank	EcoBank, All States Trust Bank, Hallmark Bank,
5	Equitorial Trust Bank Plc	Equatorial Trust Bank (ETB), Devcom
6	First City Monument Bank Plc	FCMB, Co-operative Development Bank, Nigerian-American Bank, Midas Bank
7	Fidelity Bank Plc	Fidelity Bank, FSB, Manny Bank
8	First Bank Plc	FBN Plc, FBN Merchant Bank, MBC
9	First Inland Bank	IMB, Inland Bank, First Atlantic Bank, NUB
10	Guaranty Trust Bank Plc	Guatanty Bank
11	*Stanbic-IBTC Bank Plc	Stanbic, Regent, Chartered, IBTC
12	Intercontinental Bank Plc	Global, Equity, Gateway, Intercontinental
13	Nigerian International Bank	Nigerian International Bank
14	Oceanic Bank Plc	Oceanic Bank, Int'l Trust Bank
15	Platinum-Habib Plc	Platinum Bank, Habib Bank
16	Skye Bank Plc	Prudent Bank, Bond Bank, Coop Bank, Reliance Bank, EIB
17	Spring Bank Plc	Guardian Express Bank , Citizens Bank Fountain Trust Bank, Omega Bank, Trans-International Bank, ACB
18	Standard Chartered Bank Ltd	Standard chartered bank Ltd
19	Sterling Bank Plc	Magnum Trust Bank, NBM Bank, NAL Bank, INMB, Trust Bank of Africa
20	United Bank for Africa Plc	Standard Trust Bank, United Bank for Africa, City TB, Afex Bank, City Express Bank, Gulf Bank, Liberty Bank, Metropolitan Bank, Trade Bank
21	Union Bank Plc	Union Bank, Union Merchant Bank, Universal Trust Bank, Broad Bank
22	Unity Bank Plc	New Africa Bank, Tropical Commercial Bank, Centre-Point Bank, Bank of the North, NNB, First Interstate Bank, Intercity Bank, Societe Gen. bank, Pacific Bank
23	Wema Bank Plc	Wema Bank, National Bank
24	Zenith International Bank Plc	Zenith International Bank Plc, Eagle Bank,

* Note: Stanbic bank merged with IBTC in December, 2007.

Source: Central Bank of Nigeria Annual Report and Statement of Accounts, 31st December,

2007-2013.

Table A-13: Generalised Residuals used for the computation of the Chiappori-Salanie test statistics

s/n	e_a	e_b	e_c	e_d	e_e	e_f	e_g	e_h
1	-0.422427	-0.34047	-0.55814	-0.34699	-0.422427	-0.36054	-0.21189	-0.22354
2	0.6465694	0.710895	0.693548	0.50169	0.6465694	0.679066	0.430134	0.418686
3	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
4	-0.3534306	0.002131	-0.30645	-0.16119	-0.3534306	-0.0258	-0.21189	-0.22354
5	0.5775729	0.434975	0.441861	0.474842	0.5775729	0.412661	0.629721	0.776463
6	0.5545315	0.758778	0.693548	0.805615	0.5545315	0.782916	0.738486	0.723156
7	-0.422427	-0.49506	-0.55814	-0.34699	-0.422427	-0.52352	-0.21189	-0.39366
8	-0.422427	-0.39726	-0.30645	-0.37256	-0.422427	-0.44388	-0.37028	-0.27684
9	0.5545315	0.791661	0.693548	0.838812	0.5545315	0.820698	0.738486	0.776463
10	0.6235279	0.642381	0.693548	0.50169	0.6235279	0.679066	0.380511	0.418686
11	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
12	-0.4454685	-0.49958	-0.30645	-0.49831	-0.4454685	-0.47444	-0.61949	-0.58131
13	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
14	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
15	-0.4454685	-0.36293	-0.30645	-0.16119	-0.4454685	-0.34228	-0.26151	-0.39366
16	0.6465694	0.355657	0.441861	0.315892	0.6465694	0.334851	0.430134	0.248568
17	0.6235279	0.709062	0.693548	0.66064	0.6235279	0.747405	0.580098	0.776463
18	-0.4454685	-0.43289	-0.30645	-0.33936	-0.4454685	-0.4061	-0.4199	-0.22354
19	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
20	-0.422427	-0.34047	-0.55814	-0.34699	-0.422427	-0.36054	-0.21189	-0.22354
21	-0.3764721	-0.22098	-0.30645	-0.16119	-0.3764721	-0.18877	-0.26151	-0.39366
22	0.5775729	0.705583	0.693548	0.838812	0.5775729	0.657725	0.788109	0.606345
23	-0.3764721	-0.06638	-0.30645	-0.16119	-0.3764721	-0.0258	-0.26151	-0.22354
24	0.5545315	0.791661	0.693548	0.838812	0.5545315	0.820698	0.738486	0.776463
25	0.5545315	0.27587	0.693548	0.323519	0.5545315	0.29877	0.222123	0.418686
26	0.5545315	0.121278	0.693548	0.323519	0.5545315	0.135797	0.222123	0.248568
27	0.5775729	0.659529	0.441861	0.653014	0.5775729	0.639456	0.788109	0.776463
28	0.5775729	0.213701	0.441861	0.315892	0.5775729	0.181349	0.430134	0.248568
29	-0.422427	-0.39818	-0.30645	-0.46511	-0.422427	-0.43665	-0.56987	-0.52801
30	0.6235279	0.296117	0.693548	0.356716	0.6235279	0.32708	0.222123	0.301874
31	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
32	0.6465694	0.777576	0.693548	0.66064	0.6465694	0.747405	0.629721	0.776463
33	0.5545315	0.299779	0.441861	0.315892	0.5545315	0.344322	0.380511	0.418686
34	-0.4454685	-0.46669	-0.30645	-0.46511	-0.4454685	-0.43665	-0.61949	-0.52801
35	0.5545315	0.145187	0.441861	0.315892	0.5545315	0.181349	0.380511	0.248568
36	0.5775729	0.568939	0.693548	0.50169	0.5775729	0.525565	0.430134	0.418686
37	0.5775729	0.213701	0.441861	0.315892	0.5775729	0.181349	0.430134	0.248568

38	0.5545315	0.145187	0.441861	0.315892	0.5545315	0.181349	0.380511	0.248568
39	0.5775729	0.246585	0.441861	0.349089	0.5775729	0.219131	0.430134	0.301874
40	0.5545315	0.436423	0.441861	0.653014	0.5545315	0.476482	0.738486	0.606345
41	0.5775729	0.246585	0.441861	0.349089	0.5775729	0.219131	0.430134	0.301874
42	0.5545315	0.145187	0.441861	0.315892	0.5545315	0.181349	0.380511	0.248568
43	0.5775729	0.368293	0.441861	0.315892	0.5775729	0.344322	0.430134	0.418686
44	0.6465694	0.318578	0.441861	0.170918	0.6465694	0.308811	0.271746	0.471992
45	0.6465694	0.801485	0.441861	0.653014	0.6465694	0.792957	0.788109	0.776463
46	0.5545315	0.378716	0.693548	0.534888	0.5545315	0.400373	0.380511	0.301874
47	-0.3764721	-0.70388	-0.30645	-0.64328	-0.3764721	-0.67292	-0.77788	-0.69813
48	0.5545315	0.27587	0.693548	0.323519	0.5545315	0.29877	0.222123	0.418686
49	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
50	-0.422427	-0.39726	-0.30645	-0.37256	-0.422427	-0.44388	-0.37028	-0.27684
51	-0.422427	-0.17271	-0.30645	-0.19439	-0.422427	-0.21708	-0.21189	-0.27684
52	-0.3534306	-0.22242	-0.30645	-0.33936	-0.3534306	-0.25259	-0.37028	-0.22354
53	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
54	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
55	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
56	-0.3534306	-0.03075	-0.30645	-0.19439	-0.3534306	-0.06358	-0.21189	-0.27684
57	0.5545315	0.758778	0.693548	0.805615	0.5545315	0.782916	0.738486	0.723156
58	0.5775729	0.143739	0.441861	0.13772	0.5775729	0.117528	0.271746	0.418686
59	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
60	0.5775729	0.472054	0.441861	0.619816	0.5775729	0.438701	0.788109	0.553038
61	-0.3534306	-0.8689	-0.55814	-0.86228	-0.3534306	-0.89194	-0.72825	-0.75143
62	-0.3534306	-0.48975	-0.55814	-0.68411	-0.3534306	-0.50218	-0.56987	-0.58131
63	-0.422427	-0.39818	-0.30645	-0.46511	-0.422427	-0.43665	-0.56987	-0.52801
64	-0.3534306	-0.41081	-0.30645	-0.46511	-0.3534306	-0.44613	-0.56987	-0.69813
65	0.5775729	0.246585	0.441861	0.349089	0.5775729	0.219131	0.430134	0.301874
66	0.5545315	0.534223	0.693548	0.627443	0.5545315	0.556122	0.580098	0.723156
67	-0.422427	-0.59882	-0.55814	-0.65091	-0.422427	-0.6179	-0.56987	-0.52801
68	-0.422427	-0.59882	-0.55814	-0.65091	-0.422427	-0.6179	-0.56987	-0.52801
69	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
70	-0.3534306	-0.2314	-0.55814	-0.38018	-0.3534306	-0.24482	-0.21189	-0.27684
71	0.6235279	0.250063	0.441861	0.170918	0.6235279	0.308811	0.222123	0.471992
72	-0.422427	-0.58565	-0.30645	-0.49831	-0.422427	-0.63741	-0.56987	-0.75143
73	-0.422427	-0.36438	-0.30645	-0.33936	-0.422427	-0.4061	-0.37028	-0.22354
74	-0.4454685	-0.44187	-0.55814	-0.38018	-0.4454685	-0.39833	-0.26151	-0.27684
75	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
76	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
77	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684

78	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
79	-0.3534306	-0.45595	-0.55814	-0.55836	-0.3534306	-0.47162	-0.37028	-0.27684
80	-0.4454685	-0.56358	-0.55814	-0.34699	-0.4454685	-0.52352	-0.26151	-0.39366
81	-0.3534306	-0.2314	-0.55814	-0.38018	-0.3534306	-0.24482	-0.21189	-0.27684
82	0.6465694	0.646893	0.441861	0.653014	0.6465694	0.629984	0.788109	0.606345
83	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
84	-0.3534306	-0.03075	-0.30645	-0.19439	-0.3534306	-0.06358	-0.21189	-0.27684
85	-0.4454685	-0.40898	-0.55814	-0.34699	-0.4454685	-0.36054	-0.26151	-0.22354
86	0.5545315	0.308754	0.693548	0.356716	0.5545315	0.336552	0.222123	0.471992
87	-0.3534306	-0.19852	-0.55814	-0.34699	-0.3534306	-0.20704	-0.21189	-0.22354
88	-0.3764721	-0.06638	-0.30645	-0.16119	-0.3764721	-0.0258	-0.26151	-0.22354
89	0.5545315	0.758778	0.693548	0.805615	0.5545315	0.782916	0.738486	0.723156
90	-0.3534306	0.002131	-0.30645	-0.16119	-0.3534306	-0.0258	-0.21189	-0.22354
91	0.6465694	0.544047	0.441861	0.441644	0.6465694	0.528381	0.629721	0.723156
92	-0.3764721	-0.26703	-0.55814	-0.34699	-0.3764721	-0.20704	-0.26151	-0.22354
93	-0.3534306	-0.68142	-0.55814	-0.82908	-0.3534306	-0.69119	-0.72825	-0.52801
94	0.5775729	0.659529	0.441861	0.653014	0.5775729	0.639456	0.788109	0.776463
95	-0.4454685	-0.46578	-0.30645	-0.37256	-0.4454685	-0.44388	-0.4199	-0.27684
96	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
97	-0.422427	-0.17271	-0.30645	-0.19439	-0.422427	-0.21708	-0.21189	-0.27684
98	0.6465694	0.743778	0.693548	0.534888	0.6465694	0.716848	0.430134	0.471992
99	-0.3764721	-0.71286	-0.55814	-0.68411	-0.3764721	-0.66515	-0.61949	-0.75143
100	0.5775729	0.401177	0.441861	0.349089	0.5775729	0.382104	0.430134	0.471992
101	0.6235279	0.320026	0.441861	0.349089	0.6235279	0.372632	0.380511	0.301874
102	-0.3764721	-0.55827	-0.55814	-0.68411	-0.3764721	-0.50218	-0.61949	-0.58131
103	-0.3534306	-0.03075	-0.30645	-0.19439	-0.3534306	-0.06358	-0.21189	-0.27684
104	-0.3534306	-0.2314	-0.55814	-0.38018	-0.3534306	-0.24482	-0.21189	-0.27684
105	-0.3534306	-0.41081	-0.30645	-0.46511	-0.3534306	-0.44613	-0.56987	-0.69813
106	-0.422427	-0.34047	-0.55814	-0.34699	-0.422427	-0.36054	-0.21189	-0.22354
107	0.6465694	0.710895	0.693548	0.50169	0.6465694	0.679066	0.430134	0.418686
108	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
109	-0.3534306	0.002131	-0.30645	-0.16119	-0.3534306	-0.0258	-0.21189	-0.22354
110	0.5775729	0.434975	0.441861	0.474842	0.5775729	0.412661	0.629721	0.776463
111	0.5545315	0.758778	0.693548	0.805615	0.5545315	0.782916	0.738486	0.723156
112	-0.422427	-0.49506	-0.55814	-0.34699	-0.422427	-0.52352	-0.21189	-0.39366
113	-0.422427	-0.39726	-0.30645	-0.37256	-0.422427	-0.44388	-0.37028	-0.27684
114	0.5545315	0.791661	0.693548	0.838812	0.5545315	0.820698	0.738486	0.776463
115	0.6235279	0.642381	0.693548	0.50169	0.6235279	0.679066	0.380511	0.418686
116	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
117	-0.4454685	-0.49958	-0.30645	-0.49831	-0.4454685	-0.47444	-0.61949	-0.58131

118	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
119	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
120	-0.4454685	-0.36293	-0.30645	-0.16119	-0.4454685	-0.34228	-0.26151	-0.39366
121	0.6465694	0.355657	0.441861	0.315892	0.6465694	0.334851	0.430134	0.248568
122	0.6235279	0.709062	0.693548	0.66064	0.6235279	0.747405	0.580098	0.776463
123	-0.4454685	-0.43289	-0.30645	-0.33936	-0.4454685	-0.4061	-0.4199	-0.22354
124	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
125	-0.422427	-0.34047	-0.55814	-0.34699	-0.422427	-0.36054	-0.21189	-0.22354
126	-0.3764721	-0.22098	-0.30645	-0.16119	-0.3764721	-0.18877	-0.26151	-0.39366
127	0.5775729	0.705583	0.693548	0.838812	0.5775729	0.657725	0.788109	0.606345
128	-0.3764721	-0.06638	-0.30645	-0.16119	-0.3764721	-0.0258	-0.26151	-0.22354
129	0.5545315	0.791661	0.693548	0.838812	0.5545315	0.820698	0.738486	0.776463
130	0.5545315	0.27587	0.693548	0.323519	0.5545315	0.29877	0.222123	0.418686
131	0.5545315	0.121278	0.693548	0.323519	0.5545315	0.135797	0.222123	0.248568
132	0.5775729	0.659529	0.441861	0.653014	0.5775729	0.639456	0.788109	0.776463
133	0.5775729	0.213701	0.441861	0.315892	0.5775729	0.181349	0.430134	0.248568
134	-0.422427	-0.39818	-0.30645	-0.46511	-0.422427	-0.43665	-0.56987	-0.52801
135	0.6235279	0.296117	0.693548	0.356716	0.6235279	0.32708	0.222123	0.301874
136	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
137	0.6465694	0.777576	0.693548	0.66064	0.6465694	0.747405	0.629721	0.776463
138	0.5545315	0.299779	0.441861	0.315892	0.5545315	0.344322	0.380511	0.418686
139	-0.4454685	-0.46669	-0.30645	-0.46511	-0.4454685	-0.43665	-0.61949	-0.52801
140	0.5545315	0.145187	0.441861	0.315892	0.5545315	0.181349	0.380511	0.248568
141	0.5775729	0.568939	0.693548	0.50169	0.5775729	0.525565	0.430134	0.418686
142	0.5775729	0.213701	0.441861	0.315892	0.5775729	0.181349	0.430134	0.248568
143	0.5545315	0.145187	0.441861	0.315892	0.5545315	0.181349	0.380511	0.248568
144	0.5775729	0.246585	0.441861	0.349089	0.5775729	0.219131	0.430134	0.301874
145	0.5545315	0.436423	0.441861	0.653014	0.5545315	0.476482	0.738486	0.606345
146	0.5775729	0.246585	0.441861	0.349089	0.5775729	0.219131	0.430134	0.301874
147	0.5545315	0.145187	0.441861	0.315892	0.5545315	0.181349	0.380511	0.248568
148	0.5775729	0.368293	0.441861	0.315892	0.5775729	0.344322	0.430134	0.418686
149	0.6465694	0.318578	0.441861	0.170918	0.6465694	0.308811	0.271746	0.471992
150	0.6465694	0.801485	0.441861	0.653014	0.6465694	0.792957	0.788109	0.776463
151	0.5545315	0.378716	0.693548	0.534888	0.5545315	0.400373	0.380511	0.301874
152	-0.3764721	-0.70388	-0.30645	-0.64328	-0.3764721	-0.67292	-0.77788	-0.69813
153	0.5545315	0.27587	0.693548	0.323519	0.5545315	0.29877	0.222123	0.418686
154	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
155	-0.422427	-0.39726	-0.30645	-0.37256	-0.422427	-0.44388	-0.37028	-0.27684
156	-0.422427	-0.17271	-0.30645	-0.19439	-0.422427	-0.21708	-0.21189	-0.27684
157	-0.3534306	-0.22242	-0.30645	-0.33936	-0.3534306	-0.25259	-0.37028	-0.22354

158	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
159	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
160	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
161	-0.3534306	-0.03075	-0.30645	-0.19439	-0.3534306	-0.06358	-0.21189	-0.27684
162	0.5545315	0.758778	0.693548	0.805615	0.5545315	0.782916	0.738486	0.723156
163	0.5775729	0.143739	0.441861	0.13772	0.5775729	0.117528	0.271746	0.418686
164	-0.422427	-0.13982	-0.30645	-0.16119	-0.422427	-0.1793	-0.21189	-0.22354
165	0.5775729	0.472054	0.441861	0.619816	0.5775729	0.438701	0.788109	0.553038
166	-0.3534306	-0.8689	-0.55814	-0.86228	-0.3534306	-0.89194	-0.72825	-0.75143
167	-0.3534306	-0.48975	-0.55814	-0.68411	-0.3534306	-0.50218	-0.56987	-0.58131
168	-0.422427	-0.39818	-0.30645	-0.46511	-0.422427	-0.43665	-0.56987	-0.52801
169	-0.3534306	-0.41081	-0.30645	-0.46511	-0.3534306	-0.44613	-0.56987	-0.69813
170	0.5775729	0.246585	0.441861	0.349089	0.5775729	0.219131	0.430134	0.301874
171	0.5545315	0.534223	0.693548	0.627443	0.5545315	0.556122	0.580098	0.723156
172	-0.422427	-0.59882	-0.55814	-0.65091	-0.422427	-0.6179	-0.56987	-0.52801
173	-0.422427	-0.59882	-0.55814	-0.65091	-0.422427	-0.6179	-0.56987	-0.52801
174	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
175	-0.3534306	-0.2314	-0.55814	-0.38018	-0.3534306	-0.24482	-0.21189	-0.27684
176	0.6235279	0.250063	0.441861	0.170918	0.6235279	0.308811	0.222123	0.471992
177	-0.422427	-0.58565	-0.30645	-0.49831	-0.422427	-0.63741	-0.56987	-0.75143
178	-0.422427	-0.36438	-0.30645	-0.33936	-0.422427	-0.4061	-0.37028	-0.22354
179	-0.4454685	-0.44187	-0.55814	-0.38018	-0.4454685	-0.39833	-0.26151	-0.27684
180	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
181	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
182	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
183	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
184	-0.3534306	-0.45595	-0.55814	-0.55836	-0.3534306	-0.47162	-0.37028	-0.27684
185	-0.4454685	-0.56358	-0.55814	-0.34699	-0.4454685	-0.52352	-0.26151	-0.39366
186	-0.3534306	-0.2314	-0.55814	-0.38018	-0.3534306	-0.24482	-0.21189	-0.27684
187	0.6465694	0.646893	0.441861	0.653014	0.6465694	0.629984	0.788109	0.606345
188	-0.4454685	-0.24122	-0.30645	-0.19439	-0.4454685	-0.21708	-0.26151	-0.27684
189	-0.3534306	-0.03075	-0.30645	-0.19439	-0.3534306	-0.06358	-0.21189	-0.27684
190	-0.4454685	-0.40898	-0.55814	-0.34699	-0.4454685	-0.36054	-0.26151	-0.22354
191	0.5545315	0.308754	0.693548	0.356716	0.5545315	0.336552	0.222123	0.471992
192	-0.3534306	-0.19852	-0.55814	-0.34699	-0.3534306	-0.20704	-0.21189	-0.22354
193	-0.3764721	-0.06638	-0.30645	-0.16119	-0.3764721	-0.0258	-0.26151	-0.22354
194	0.5545315	0.758778	0.693548	0.805615	0.5545315	0.782916	0.738486	0.723156
195	-0.3534306	0.002131	-0.30645	-0.16119	-0.3534306	-0.0258	-0.21189	-0.22354
196	0.6465694	0.544047	0.441861	0.441644	0.6465694	0.528381	0.629721	0.723156
197	-0.3764721	-0.26703	-0.55814	-0.34699	-0.3764721	-0.20704	-0.26151	-0.22354

198	-0.3534306	-0.68142	-0.55814	-0.82908	-0.3534306	-0.69119	-0.72825	-0.52801
199	0.5775729	0.659529	0.441861	0.653014	0.5775729	0.639456	0.788109	0.776463
200	-0.4454685	-0.46578	-0.30645	-0.37256	-0.4454685	-0.44388	-0.4199	-0.27684
201	-0.4454685	-0.20834	-0.30645	-0.16119	-0.4454685	-0.1793	-0.26151	-0.22354
202	-0.422427	-0.17271	-0.30645	-0.19439	-0.422427	-0.21708	-0.21189	-0.27684
203	0.6465694	0.743778	0.693548	0.534888	0.6465694	0.716848	0.430134	0.471992
204	-0.3764721	-0.71286	-0.55814	-0.68411	-0.3764721	-0.66515	-0.61949	-0.75143
205	0.5775729	0.401177	0.441861	0.349089	0.5775729	0.382104	0.430134	0.471992
206	0.6235279	0.320026	0.441861	0.349089	0.6235279	0.372632	0.380511	0.301874
207	-0.3764721	-0.55827	-0.55814	-0.68411	-0.3764721	-0.50218	-0.61949	-0.58131
208	-0.3534306	-0.03075	-0.30645	-0.19439	-0.3534306	-0.06358	-0.21189	-0.27684
209	-0.3534306	-0.2314	-0.55814	-0.38018	-0.3534306	-0.24482	-0.21189	-0.27684
210	-0.3534306	-0.41081	-0.30645	-0.46511	-0.3534306	-0.44613	-0.56987	-0.69813

Source: Author's computed

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Appendix 2
Table B-1: Details of the responses from the five-man panellist

Q/N	E	U	NU	NN	Q/N	E	U	NU	NN	Q/N	E	U	NU	NN	Q/n	E	U	NU	NN	Q/N	E	U	NU	NN	CVI
1				1	1		1			1				1	1				1	1				1	**-0.6**
2				1	2			1		2				1	2			1		2				1	**-0.6**
3				1	3			1		3				1	3			1		3				1	**-0.6**
4	1				4	1				4	1				4	1				4	1				**0.6**
5	1				5	1				5	1				5	1				5	1				**0.6**
6		1			6		1			6		1			6		1			6		1			**-1**
7	1				7	1				7	1				7	1				7	1				**0.6**
8	1				8	1				8	1				8	1				8	1				**0.6**
9	1				9	1				9	1				9	1				9	1				**0.6**
10	1				10	1				10	1				10	1				10	1				**0.6**
11		1			11		1			11		1			11		1			11		1			**-1**
12	1				12	1				12	1				12	1				12	1				**0.6**
13	1				13	1				13	1				13	1				13	1				**0.6**
14				1	14				1	14				1	14				1	14				1	**-0.6**
15				1	15				1	15				1	15				1	15				1	**-0.6**
16	1				16	1				16	1				16	1				16	1				**0.6**
17	1				17	1				17	1				17	1				17	1				**0.6**
18	1				18	1				18	1				18	1				18	1				**0.6**
19	1				19	1				19	1				19	1				19	1				**0.6**
20	1				20	1				20	1				20	1				20	1				**0.6**
21	1				21	1				21	1				21	1				21	1				**0.6**
22		1			22	1				22		1			22		1			22		1			**-0.6**
23				1	23			1		23				1	23				1	23				1	**-0.6**
24				1	24			1		24				1	24				1	24				1	**-0.6**
25	1				25	1				25	1				25	1				25	1				**0.6**
26	1				26	1				26	1				26	1				26	1				**0.6**
27	1				27	1				27	1				27	1				27	1				**0.6**
28	1				28	1				28	1				28	1				28	1				**0.6**
29	1				29	1				29	1				29	1				29	1				**0.6**
30				1	30				1	30				1	30				1	30				1	**-0.6**
31	1				31	1				31	1				31	1				31	1				**0.6**
32	1				32	1				32	1				32	1				32	1				**0.6**
33	1				33	1				33	1				33	1				33	1				**0.6**
34		1			34		1			34		1			34		1			34		1			**-1**
35	1				35	1				35	1				35	1				35	1				**0.6**
36	1				36	1				36	1				36	1				36	1				**0.6**
37	1				37	1				37	1				37	1				37	1				**0.6**

38	1				38	1				38	1				38	1				38	1				**0.6**
39	1				39	1				39	1				39	1				39	1				**0.6**
40		1			40		1			40		1			40		1			40		1			**-1**
41				1	41				1	41				1	41				1	41				1	**-0.6**
42				1	42				1	42				1	42				1	42				1	**-0.6**
43				1	43				1	43	1				43				1	43				1	**-0.2**
44		1			44		1			44		1			44		1			44		1			**-1**
45	1				45	1				45	1				45	1				45	1				**0.6**
46		1			46		1			46		1			46		1			46		1			**-1**
47		1			47		1			47		1			47		1			47		1			**-1**
48		1			48		1			48		1			48		1			48		1			**-1**
49			1		49			1		49			1		49			1		49			1		**-1**
50				1	50				1	50				1	50				1	50				1	**-0.6**
51				1	51				1	51				1	51				1	51				1	**-0.6**
52				1	52				1	52				1	52				1	52				1	**-0.6**
53				1	53				1	53				1	53				1	53				1	**-0.6**
54				1	54				1	54				1	54				1	54				1	**-0.6**
55	1				55	1				55	1				55	1				55	1				**0.6**
56	1				56	1				56	1				56	1				56	1				**0.6**
57	1				57	1				57	1				57	1				57	1				**0.6**
58				1	58				1	58				1	58				1	58				1	**-0.6**
59	1				59	1				59	1				59	1				59	1				**0.6**
60				1	60				1	60				1	60				1	60				1	**-0.6**
61				1	61				1	61				1	61				1	61				1	**-0.6**
62	1				62	1				62	1				62	1				62	1				**0.6**
63	1				63	1				63	1				63	1				63	1				**0.6**
64		1			64		1			64		1			64		1			64		1			**-1**
65	1				65	1				65	1				65	1				65	1				**0.6**
66	1				66	1				66	1				66	1				66	1				**0.6**
67	1				67	1				67	1				67	1				67	1				**0.6**
68	1				68	1				68	1				68	1				68	1				**0.6**
69	1				69	1				69	1				69	1				69	1				**0.6**
70	1				70	1				70	1				70	1				70	1				**0.6**

Source: Author's Computation

Appendix C

Figure C-1: Extensive Form Representation of the Bank-Borrower Signalling Game

Figure C-2: Extensive Form Representation of the Bank-Borrower Signalling Game
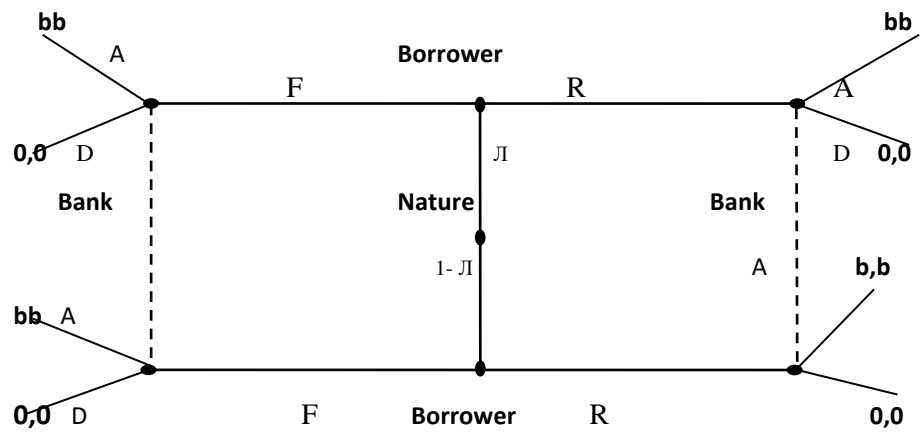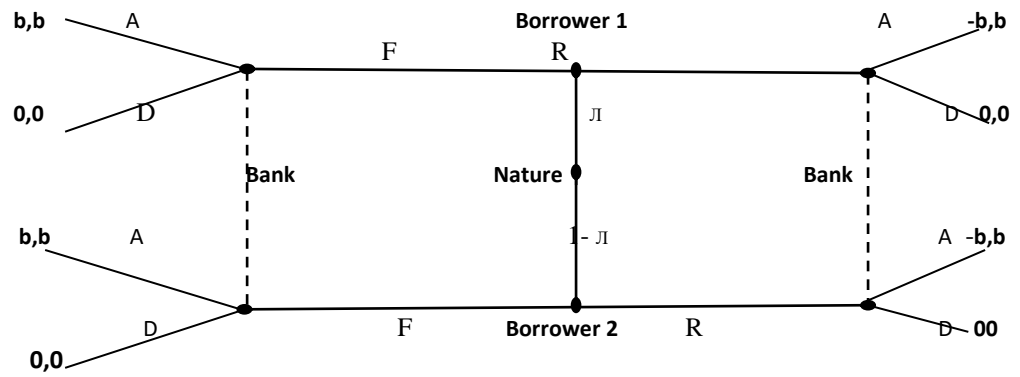
Source: Author's Characterization

Figure C-3: Extensive Form Representation of Bank-Borrower Signalling Game
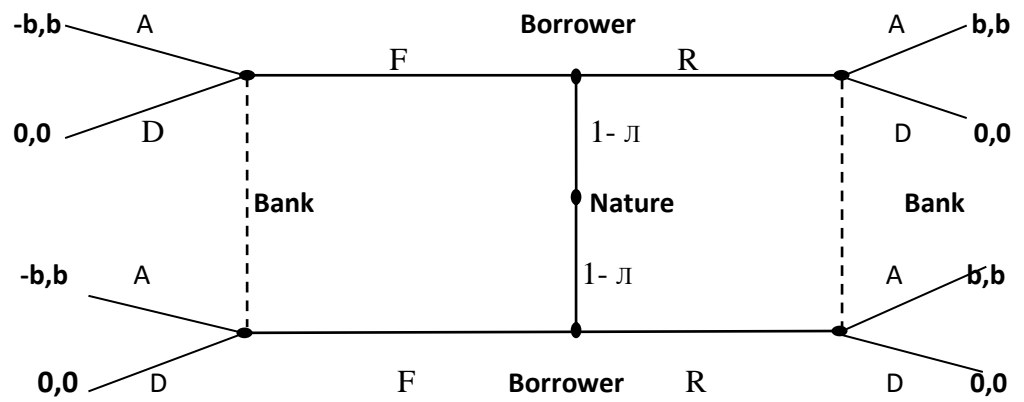
Source: Author's Characterization

Appendix D

Computation of the Borrowers' payoffs

We assume that the payoffs to the bank and the players are derived from the amount of loan made. Mainly, the incentive for the loan is derived from the profit that will result there from. The bank and the borrowers are assumed share the profit made in the ratios of $^1/_3$ and $^2/_3$ respectively in the successful outcome of the loan. Otherwise, the borrower loses the pledged collateral which the bank holds in lieu of the loan. The underlying assumption is that all loans are collateralized (and repayment enforceable), but banks are essentially interested in the repayment of their loans from the proceeds of investment rather than liquidating the pledged collateral. In principle, payoffs are realizable on the portion of the loans which were actually repaid. The banks one-third share of the realizable profit is assumed to be sufficiently large enough to offset the cost of the loans with profits. In addition, the value of the collateral is assumed to be sufficiently adequate to recoup the cost of the loan. In the arbitrary term, bank loans do not exceed two-third of the value of the collateral pledged. Where cash or more liquid asset is to be used as collateral, the value of the collateral are usually allowed to range between 120-150 per cent of the loan value (though also depending on the term of the loan). Following from table 6.1., only 59.05 of the loans made succeeded. Thus, the computations of the individual payoffs were computed based on the success rate.

Table D-1: Computation of the Bank-Borrower Payoffs

Loans Sizes (category)	Average Amount Involved (N'000)	Number of borrowers	Total Amount Loaned (N'000)	Amount due to the Banks ($^1/_3$), N'(000)	Amount due to the Borrowers ($^2/_3$), N'(000)	Total Returns to be Shared N'(000)
0 - N500,000	250	136	34,000	1177	2354	3531
N500,001-N2M	1250	46	57,500	1991	3982	5973
N2M- N5M	3500	14	49,000	1697	3394	5091
>N5M	5000	14	70,000	2423	4846	7269
Total	**10,000**	**210**	**210,500**	**7288**	**14576**	**21864**

Note: Amount due the bank and the borrowers were calculated based on the success rate of 59.05, at 2010 prime lending rate baseline of 17.59%.

Source: Author's Computation

Appendix E
Questionnaire on Information Asymmetry and Efficiency of Bank Lending in Nigeria

Dear respondent,

This questionnaire collects information on from persons who had used bank loans to finance business or investment activities. The information supplied is required for academic purpose, which will lead to the award of a PhD and would be treated with all confidentiality required. A borrower with multiple experiences may request to respond to more than one questionnaire.

General Information: Please tick (√) as it apply to you

1) Town/place of residence..

2) State...................................

3) Name of the Bank in question.., Branch/Location..

4) Age (a) less than 30 (b) 31-40 (c) 41-50 (d) 51-60 (e) 60 years above

5) Number of years of banking with the bank? ....

6) Years of experience in the business (a) 1- 3 years (b)less than 5 years (c) less than 10 years (d) above 10 years

7) Level of Education (a) Primary (b) Secondary (c) Tertiary (d) others

8) Nature of Business: (a) small scale (b) medium scale (c) large scale

9) When was the last time you used/or began a using bank's facility (a) within the last 1 year (b) over 2 years ago (c) over three year ago (d) less than 5 years ago (e) over the past 5 years.

10) What was the exact interest rate at which such loan was extended to you by the bank? ....

11) If you have retired the loan, what became the eventual interest charged on the loan?.................................

12) Were all the necessary charges by the bank clearly made known to you precedent to the loan? A) Yes B) No

13) Mention/Tick the charges as applied to your/the loan and their rates

    (a) Management/ maintenance/ processing fee

    (b) ....

    (c) ....

    (d) ………………………………………………………….

14) How many years (or months) were you required to repay the loan? ....

15) What percentage was deducted upfront? ………………………………….

16) How much loan do you apply for..

17) How much was released to you?..

18) If 16 and 17 are not the same, why did the bank not fully mobilise you ....

19) How much did you repaid/have to repay to the bank..

20) Was the loan extended on (a) simple or (b) compounding interest rate (underline as appropriate)

21) What was the purpose of the loan (a) to boost working capital (b) expand existing business (c)initiate a new investment (d) Embark on foreign studies (e) others (specify)..

22) Do you think the purpose for the loan affects the interest charged on it? A) Yes B) No

23) From the onset, do you foresee probability that you will default? A) Yes B) No

24) Was the loan guaranteed to succeed? A) Yes B) No

25) If (24) was yes, rate the credibility of the guarantor to repay in the case of default (a) certainly (b) uncertain

26) To the best of your knowledge, did you hide important private fact from the bank when you were applying for the loan? A) Yes B) No

27) Mention some of such information:

(i)...

(ii)...
(iii)...

28) Do you think you need to fully disclose all relevant information as required by the bank? A) Yes B) No

29) Why (a)..·

30) Do you actually succeed with the loan financed investment A) Yes B) No

31) Mention two things that contributed to the loan default/success
   (i)..
   (ii)..

32) Did you take any action that contributed to the loan failure that the bank did not know about? A) Yes B) No

33) Please name two of them
   (i)..
   (ii) ....

34) Rank the portion of the loan spent outside the purpose of the loan? (a) less than 5%   (b) less than 10% (c) 10 – 20% (d) None (e) Specify ....

35) How would you assess the bank rate (a) fair (b) moderate (c) too high? (tick as appropriate)

36) If you are offered a new facility again by the bank, will you accept it? A) Yes B) No

37) What type of security (ies) was required from you (a) building (b) Guarantor (c) others, specify.....................................

38) What other things were required by the banks before the loan was extended. Mention just two of them
   a)...
   b)...

39) What is the ratio of this collateral required to the value of the loan offered to you? a) 2:1 b)3:2 c)3:1, specify...............

40) Based on your assessment of the bank, was the bank's screening stringent enough to foreclose default? A) Yes B) No

41) How would you assess the ability of the loan to fulfil your purpose (a) satisfactory (b) fairly (c) unsatisfactory

42) Based on your experience with the bank, how much do you trust the bank to be honest? (a) Fully (b) Fairly (c) Rarely

43) How much of your money is involved in the investment (a) about 25% (b) about 50% (c) about 75%

44) What type of business was the loan invested in? (a)Buying and Selling (b) Manufacturing (c) Transportation (d) Agriculture (e) others (i).............................
                          (ii).............................

45) When was the loan availed to you……………………………………..

46) What is the worth of your business as at the time you obtained the loan (a) N200,000 to N500,000 (b) N500,000 – N1,000,000 (c) N1,000,000 –N2,000,000 (d) above N2,000,000

47) what is the worth of your business at present (a) less than N500,000 (b) N500,000 –N1,000,000 (c) less than N2,000,000 (c) less than N3,000,000 (c) others specify...

48) Do you think it is risky to use bank's loan for investment? A) Yes B) No

49) Do you patronise local informal financial outlets apart from the commercial banks (a) Yes (b) No

50) Mention the type of informal outlet: (a) Esusu (b) Cooperative (c) Daily contributions (d) specify ....

51) Have you ever borrowed from them (a) Yes (b) No

52) Do you support that the microfinance lends more to the public than the commercial banks A) Yes B) No

53) Do you support the argument that commercial bank's loan fail than the microfinance's A) Yes B) No

54) If (53) is true, give reasons

(i)…………………………………………………………………………………………..
(ii)………………………………………………………………………………………….

55) Were you asked to sign any loan (or restrictive) covenant before the before the loan was granted to you (a) yes (b) No

56) Do you think you can go scot-free with the banks' loan? A) Yes B) No

57) How long were you required to repay the loan (a) 6 months to one year (b) 12 months to 18 months (c) 18 months to 24 months (d) 2 – 3 years (e) more than three years

58) Did you have to induce (bribe) induce the bank's loan officer before you were extended the loan A) Yes B) No

59) Share three lessons from encounter with bank loan
   a)..
   b)..
   c)..

60) Was anything illegal or unfair done to you by the bank after being granted the loan A) Yes B) No

61) Mention some of them
   a)..
   b)..
   c)..

62) Mention the number of times you have used bank loans (a) once (b) twice (c) thrice (d) more than three times

63) Did any of such loans failed from you? ....

64) Why (i)...
      (ii)...

65) Do you think banks are doing their work properly in Nigeria? A) Yes B) No

66) Do you think banks are to blamed or the borrowers?..

67) Give two reasons to support your position
(i)...
(ii)...

68) On being given the offer letter, how long did it take to return it to the bank?
(a) same day that u were given (b) two days (c) three days (d) more than 3 days

69) Mention two things done by banks that you consider make customers to default
      (i)...
      (ii)... .

70) Suggest two things that can be done to make the Nigerian commercial banks efficient?
      (i)...
      (ii)...

Thanks for your response!

APPENDIX E

Table E-1: Definition of some benchmark variables used

Variables	Definition	Measurement
(i) Default Incidence	Defined as the ratio of loan in question that actually failed.	If failed=0, otherwise 1
(ii) Bank Hidden Information	Are there bank charges unknown to the borrower prior to the disbursement of the loan	If yes=0, otherwise 1
(iii) Duration	The term of the loan, measured in years	<1year=1, 2-3.99years=2, 4-5.99years=3, above 6years =4
(iv) Portion spent outside the intended project	The amount of money which was spent on activities outside the purpose for which the loan was availed. This measures ex-post asymmetry by the borrower	<99.99%=1, (10-19.99)%=2, (20-29.99)%=3, >30% and above=4
(v) Interest rate	Defined in terms of how theborrower view the cost of the rate	Fair=1, high=2
(vi) Collateral requirement/ pledged	Refers to the value of the collateral in relation to the amount loaned	Three categories considered: 2:1, 3:2, and 3:1. Ratio 2:1was preferred.
(vii) Incomplete Information Disclosure	Refers to how much information the borrower hoards from the bank.	If information presented to the bank differs from the eventual observation after the loan=1, otherwise=2.
(viii) Moral Hazard	Defined as whether the borrower took any action that precipitated default	If yes=2, otherwise=1
(ix) Judgment of the bank rate	Refers to the borrowers perception about the severity of the bank rate	If considered very high=2, otherwise=1
(x) Default scot-free	Based on the socio-economic environment of lending in Nigeria, a number of borrowers are of the view that they could get away with the bank loans in view of their knowledge about the inherent loopholes in the system	If holding such perception=2, otherwise=1.
(xi) Filed in the past loan	There is a general tendency that borrower who had failed in past loans to to default when new loans are availed to them.	Had a borrower failed in past loans=2, otherwise=1
(xii) Stringency of the loan	This defines the extent by which the borrowers perceive the loans to be severe.	Where the lending contract is considered as non stringent=1, otherwise=2

Note: The usage of the default variables in the estimations are mostly in the affirmative state.
Source: Author's categorization

APPENDIX F: The logit versions of the regression results

Table 6.4a: Logit regression when borrowers were classified based on the amount diverted

Default Incidence	5-10% disinvested Coefficient	10-20% disinvested Coefficient	20-30 disinvested Coefficient	> 30% Coefficient
Not fully disclosed Information	1.371(0.368)***	-0.333(0.347)	0.321(0.423)	-1.339(0.480)***
Hidden information	0.284(0.396)	-0.090(0.381)	1.057(0.444)*	-1.901(0.626)***
Involved in moral hazard	0.411(0.432)	-0.026(0.425)	-0.065(0.483)	-1.209(0.813)
Judged bank rate as too high	1.474(0.371)***	-0.861(0.337)**	-0.242(0.407)	-0.419(0.433)
Collateral pledged 2:1	-0.427(0.348)	0.679(0.332)*	-0.307(0.410)	0.090(0.436)
Considered stringency as weak	-1.284(0.380)***	0.244(0.358)***	0.121(0.414)	0.553(0.449)
Could default scot-free	-0.927(0.467)**	1.122(0.383)*	-1.109(0.605)*	1.086(0.477)*
Failed in the past loan	-0.099(0.467)	0.741(0.373)	-0.425(0.447)	0.333(0.482)***
Constant	-1.577(0.449)***	-1.571(0.428)***	-1.762(0.508)***	-0.954(0.487)**
Prob > chi2	0.000	0.0019	0.2360	0.0000
Pseudo R2	0.2006	0.0958	0.0582	0.1857
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

(ii) The values in the bracket are the standard errors

Table 6.5a: Logit regression when only 5-10% was diverted across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	0.5774(0.368)	-1.415(0.487)***	-0.440(0.217)**	-0.453(0.220)**
Hidden information	1.333(0.358)***	0.765(0.214)***	0.801(0.213)***	0.827(0.216)***
Involved in moral hazard	0.844(0.408)**	0.459(0.247)*	0.528(0.240)**	0.499(0.250)*
Judged bank rate as too high	-0.014(0.351)	-0.033(0.213)	-0.010(0.213)	-0.173(0.200)
Collateral pledged 2:1	0.350(0.331)	0.276(0.199)	0.345(0.208)	0.241(0.197)
Considered stringency as weak	0.135(0.359)	0.070(0.215)	0.104(0.213)	0.136(0.211)
Only 5-10% disinvested	-1.121(0.434)*	-0.626(0.254)**	-0.474(0.238)**	-0.457(0.239)*
Could default scot-free	0.763(0.389)**	0.455(0.247)*	0.605(0.235)**	0.618(0.235)***
Failed in the past loan	0.954(0.352)***	0.615(0.216)***	0.602(0.213)***	0.623(0.221)***
Constant	-1.854(0.444)***	-0.893(0.262)***	-0.924(0.264)***	-0.974(0.261)***
Prob > chi2	0.000	0.000	0.003	0.062**
Pseudo R2	0.1971	0.216	0.205	0.203
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level based on the probability values.

(ii) The values in the bracket are the standard errors

Table 6.5a: Logit regression when only 10-20% was disinvested across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	-0.580(0.217)**	-0.491(0.216)**	-0.495(0.216)**	-0.522(0.220)**
Hidden information	0.664(0.212)***	0.751(0.216)***	0.774(0.210)***	0.809(0.213)***
Involved in moral hazard	0.484(0.237)**	0.4153(0.244)*	0.464(0.237)**	0.425(0.247)*
Judged bank rate as too high	-0.152(0.204)	-0.193(0.204)	-0.164(0.203)	-0.121(0.203)
Collateral pledged 2:1	0.270(0.201)	0.226(0.203)	0.290(0.200)	0.276(0.200)
Considered stringency as weak	0.272(0.209)	0.242(0.210)	0.242(0.211)	0.268(0.210)
Only 10-20% disinvested	-0.113(0.224)**	-0.090(0.224)**	-0.124(0.222)**	-0.150(0.225)*
Could default scot-free	0.659(0.240)**	0.599(0.241)*	0.675(0.234)**	0.702(0.234)***
Failed in the past loan	0.608(0.217)***	0.647(0.216)***	0.638(0.215)***	0.677(0.226)***
Constant	-1.008(0.330)**	-1.027(0.259)***	-0.999(0.264)***	-1.046(0.261)***
Prob > chi2	0.000	0.000	0.003	0.062**
Pseudo R2	0.1886	0.1947	0.1915	0.1916
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.
(ii) The values in the bracket is the standard errors

Table 6.6a: Logit regression when only 20-30% was disinvested across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	-0.529(0.223)**	-0.554(0.225)**	-0.549(0.223)**	-0.571(0.226)**
Hidden information	0.769(0.220)***	0.644(0.218)***	0.690(0.210)***	0.731(0.220)***
Involved in moral hazard	0.568(0.249)**	0.475(0.244)*	0.546(0.248)**	0.509(0.257)*
Judged bank rate as too high	-0.159(0.210)	-0.209(0.211)	-0.154(0.208)	-0.094(0.209)
Collateral pledged 2:1	0.338(0.210)	0.286(0.212)	0.349(0.209)	0.343(0.209)
Considered stringency as weak	0.141(0.214)	0.109(0.217)	0.124(0.215)	0.154(0.214)
Only 20-30% disinvested	1.216(0.329)**	1.256(0.329)**	1.168(0.322)**	1.180(0.326)*
Could default scot-free	0.783(0.245)**	0.701(0.247)***	0.805(0.241)***	0.819(0.240)***
Failed in the past loan	0.608(0.221)***	0.736(0.224)***	0.711(0.220)***	0.758(0.231)***
Constant	-1.114(0.330)**	-1.241(0.268)***	-1.212(0.273)***	-1.276(0.270)***
Prob > chi2	0.000	0.000	0.003	0.062**
Pseudo R2	0.2511	0.2519	0.2426	0.2419
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

    (ii) The values in the bracket are the standard errors

Table 6.7a: Logit regression when over 30% was disinvested across the various loan sizes

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	-0.506(0.217)**	-0.508(0.216)**	-0.527(0.217)**	-0.541(0.219)**
Hidden information	0.682(0.219)***	0.660(0.218)***	0.675(0.217)***	0.720(0.221)***
Involved in moral hazard	0.444(0.239)**	0.379(0.245)*	0.431(0.239)**	0.385(0.249)*
Judged bank rate as too high	-0.158(0.210)	-0.220(0.204)	-0.194(0.202)	-0.145(0.203)
Collateral pledged 2:1	0.240(0.198)	0.200(0.200)	0.241(0.198)	0.233(0.198)
Considered stringency as weak	0.225(0.205)	0.211(0.207)	0.201(0.207)	0.230(0.206)
Over 30% disinvested	-0.455(0.278)**	-0.436(0.278)***	-0.478(0.280)***	-0.464(0.277)***
Could default scot-free	0.719(0.244)**	0.652(0.244)**	0.724(0.238)**	0.741(0.657)**
Failed in the past loan	0.603(0.214)***	0.621(0.215)***	0.620(0.213)***	0.657(0.221)***
Constant	-0.896(0.341)**	-0.901(0.268)***	-0.855(0.274)***	-0.915(0.270)***
Prob > chi2	0.000	0.000	0.000	0.000
Pseudo R2	0.2411	0.2519	0.2426	0.2419
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.
(ii) The values in the bracket are the standard errors

Table 6.8a: Logit regression when no part of the loan was diverted

Default Incidence	< ₦500,000 Coefficient	₦(500,000-2m) Coefficient	₦2m-₦5m Coefficient	> ₦5m Coefficient
Not fully disclosed Information	0.506(0.338)	-0.406(0.409)	1.503(0.815)	0.218(0.796)
Hidden information	-0.671(0.348)*	0.646(0.424)	-0.823(0.737)	1.397(0.745)*
Involved in moral hazard	-0.270(0.383)	1.505(0.444)***	-0.612(0.881)	---
Judged bank rate as too high	-0.825(0.337)*	0.964(0.423)	-0.718(0.598)	1.036(0.747)
Collateral pledged 2:1	0.350(0.315)	0.577(0.390)	0.008(0.592)	0.002(0.740)
Considered stringency as weak	-0.260(0.330)	0.389(0.396)	-0.686(0.681)	0.989(0.715)
All loans were fully used	0.231(0.651)**	-0.597(0.845)	---	3.104(1.1798)**
Could default scot-free	-1.150(0.378)***	1.594(0.442)***	-0.826(0.841)	-0.323(0.861)
Failed in the past loan	-0.632(0.343)*	-0.092(0.415)	0.642(0.655)	2.581(0.877)***
Constant	2.059(0.448)**	-3.291(0.591)***	-1.314(0.707)*	-5.683(1.235)***
Prob > chi2	0.0012	0.000	0.1596	0.0055
Pseudo R2	0.1002	0.1752	0.1172	0.2302
No. of Observations	210	210	210	210

Source: Author's computation

Note: (i) ***= 1% significant level; **=5% significant level; *=10% significant level.

(ii) The values in the bracket are the standard errors

Table:6.10a: Chiappori-Salanie test statistics for the various categories

Category	Less than ₦500,000	₦500,000-₦2million	(₦2 – ₦5)million	Above ₦5million
Chiappori-Salanie (W)	141.51	71.03	122.92	102.02

Source: Author's computation

Note: This computation represents when only positively correlated default variables were used against the general default variables.