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DETERMINANTS OF LOAN DELINQUENCY AMONG RURAL BANKS IN THE ASHANTI REGION

BY

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Mum, Dad and Uncle Otoo, you will forever remain in my heart. The pillar of my joy

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ABSTRACT

The main objective of the study is to determine loan delinquency among Rural Banks in the Ashanti region of Ghana. The design was quantitative, explanatory, and a desk study. The sample of the study was 10 rural banks based on data availability. The data for the study was secondary and was gathered from the annual reports of the banks. The data was analysed using panel regression. On the board characteristics, the study found that board size and board independence did not have a significant effect of loan delinquency. However board gender diversity had a significant positive effect of loan delinquency. On macro-economic characteristics, the study found that GDP does not have a significant effect on loan delinquency. Policy rate had a negative effect whiles inflation had a positive effect on loan delinquency. Concerning firm characteristics, the study found that liquidity did not have a significant effect on loan delinquency. However bank size and capital adequacy had a significant negative effect on loan delinquency. It is recommended that rural banks should increase capital adequacy. Rural banks can increase their capital adequacy by retaining earnings, issuing new shares or debt, or reducing their risk-weighted assets. They can also implement more conservative lending practices and risk management policies to reduce the likelihood of loan losses.

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LIST OF ABBREVIATIONS

LD: loan delinquency

BSZ: board size

BGD: board gender diversity

BI: board independence

CA: capital adequacy ratio

LIQ: liquidity

PR: Policy rate

IFL: Inflation rate

GDP: GDP growth

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Loan Delinquency is among the topical issues being discussed among financial institutions, practitioners and policy makers. In the face of United Nations Agenda 2030 for Sustainable Development, the drive towards capital mobilization has very imperative to achieve the goals. Loan Delinquency is one of the challenges which could distort the needed financial resources for development and growth (Lamichane, 2022).According to Johnston (2022), a loan delinquency is a loan that has not been repaid. Besides, a loan delinquency refers to the speed of repayment; if repayment is delayed, the loan becomes a non-performing loan, i.e., a loan that is already 'non-performing' is a non-performing loan

Imperatively, the backbone of the economic wellbeing in every country is the effectiveness and efficiency of the country's bank operations. Thus, the strength of any economy is closely linked to the health of its banking system (Adusei, 2017; Aidoo and Mensah, 2018). A healthy banking system mobilizes household savings and enables them to invest in productive businesses. To this end, banks mobilize savings and distribute them to businesses and individuals through loans, which is important for economic development (Ume et al., 2018; Wadud et al., 2019). Banks do not create new wealth, but through lending, credit and other related activities, they contribute to the creation, distribution, exchange and consumption of wealth. Banks face many challenges in financing trade, but one of the most important is investing in the right credit opportunities while trying to understand when the troubled economic waters will calm and what the landscape will look like thereafter (Yeboah

and Oduro, 2018; Fuinhas et al., 2019). Banks provide the financial resources necessary for decision-making in the economic development process. Hence, their collaboration is crucial in the economic development process.In today's contemporary world, banks play an utmost imperative role in the use of public funds. Nowadays, all economic activities are highly dependent on the availability of financial services.It is argued (Yeboah and Oduro, 2018; Fuinhas et al., 2019) that the loan defaults are the major causes of problems with regards to stagnation in economy.

Running a system free from loan default is robust to enhance the economic status of the economy. If loan defaults are prevented and roll overs are ceased, the banks will be free from any lock-ups and hence its activities will promote economic growth and enhance economic efficiency. A study by Antwi et al. (2012) identified a number of risk factors affecting the repayment of the loan default of Akuapem Rural Bank's clients. The credit department of Akuapem Agricultural Bank collected secondary data on some variables that affect the repayment of loans to clients. Among the variables used, it was found that collateral and loan type were relevant for the study, while gender, marital status, age, education, and city were not relevant for the study. The study then concluded that clients who make use of a personal guarantee for late payment run a higher risk than clients who make use of a guarantee for access to credit. Using a transport loan as a reference, the risk of a client not meeting a personal loan is lower than a transport loan in total. Moreover, Afful et al. (2013) analyse the management of loans and arrears in rural banks, Atwima Kwanwoma rural banks as a case study. The survey showed that clients must meet certain conditions to obtain a loan, such as an impressive bank account, guarantees or a high turnover. Besides, Luoga (2013)

evaluated loan defaults and factors affecting SACCOS' loan defaults. The survey showed that there is a problem with the repayment of loans to SACCOS members. Osero et al (2013) examined the effectiveness of monitoring strategies applied by Kenyan commercial banks to address the problem of loan repayment. The results of the study show that most commercial banks have an effective system for monitoring outstanding arrears and therefore rarely use RCF services and some banks (3.6 out of 5) therefore use RCF services for arrears collection. It is in the light of the above presentation that the current study is conducted among rural banks in Ghana to ascertain the determinants of credit risk.

1.2 PROBLEM STATEMENT

Rural banks play an important role in economic development by providing financing to lowincome groups that cannot meet the demands of commercial banks. Rural banks play an important role in economic development, as commercial banks mainly serve the working class and its businesses. However, rural banks are increasingly facing the problem of loan defaults by their customers.Yeboah and Oduro (2018) explored the effect of credit risk on the performance of rural banks and revealed that lack of credit risk management was one of the factors resulting to loan default in the financial market. Also, the study discovered that education, loan diversion, monitoring, marital status and income were some significant factors that influenced loan default. Adusei (2017) examined the factors resulting to loan default in the financial institutions and revealed that lack of financial supervision in most rural banks was the cause of loan default in most financial institutions. Besides, the study discovered that high interest rate, double loan borrowing and improper loan disbursement record were some factors that lead to loan default within most financial institutions. Fuinhas et al. (2019) determined the number of students that default loans and found that

unemployment rate, average debt per borrower and consumer sentiment were factors influencing loan default. The research indicated that unemployment rate and average debt had negative impact on loan default. The main economic role of banks is to improve access to finance in the form of credit. Bad loans threaten the viability, sustainability and viability of financial institutions (Bichanga and Aseyo, 2013; Aidoo and Mensah, 2018). Earlier studies have examined the impact of credit sharing on bad loans (Nzongang et al., 2014; Ume et al., 2018). However, in Kumasi, the capital city of Ghana, there is few studies on the factors influencing loan delinquency among rural bank customers, so this study aimed to answer this question.

1.3 OBJECTIVE OF THE STUDY

The main objective of the study is to determine loan delinquency among Rural Banks in the Ashanti region of Ghana. The specific objectives of the study are as follows:

1. To examine the impact of board characteristics on loan delinquency of Rural Banks

2. To investigate the effect of macro-economic factors on loan delinquency of Rural Banks

3. To assess the impact of firm characteristics on loan delinquency of Rural Banks

1.4 RESEARCH QUESTION

1. What is the effect of board characteristics on loan delinquency of Rural Banks?

2. What is the effect of macro-economic factors on loan delinquency of Rural Banks?

3. What is the effect of firm characteristics on loan delinquency of Rural Banks?
1.5 SIGNIFICANCE OF THE STUDY

The findings of this study will help major players in the financial sector such as government, rural banks consultants, investors, customers and academicians in order to know the variables

which are the critical in loan delinquency creation. Although the authorities have taken measures to address the problem, the number of loan delinquency in rural banks is increasing.

The results of the study will help rural banks in their credit management decisions. The study can also be useful for elite clients as the results can be used to make recommendations. In addition, the budget policies developed will be clearly analysed in the light of these key variables.

The study will help banks to determine the sensitivity of different loan applications to these key variables so that they can properly assess risk. The study will also be useful for borrowers as it will help them identify the key factors affecting their business so that they can plan their operations accordingly.

As mentioned earlier, the level of insolvency in Ghana is driving up the cost of borrowing and the company would be well advised to identify the reasons for this. Furthermore, this conclusion is useful for researchers who want to explore this issue further, as it represents a grey area for future research. Policy makers can use it as a basis for decision-making and regulation of the rural banking sector.

1.6 SCOPE AND LIMITATIONS OF THE STUDY

This research is focused on community and rural banks in the Ashanti region. The region and banks were selected due to the researcher's access to data. Data is gathered from the annual report of the selected banks. The main setback associated with this research was the availability of secondary data for the selected community and rural banks. It is difficult in

accessing financial statements from the community and rural banks. At times too, the proximity of the banks in itself was not easy for the researcher to physically visit to get access to the financial statements. Hence only 10 RCBs were selected because of time and monetary restraints on the part of the researcher. As such, it can be said that contextually, the study was limited as it did not cover the whole rural and community banks in the Ashanti Region, but this did not affect the cogency and reliability of the study as the study followed appropriate methodological approach.

1.7 OVERVIEW OF METHODOLOGY

This study employed the quantitative design because the research questions require the collection of numerical data. The data is gathered from the annual reports of the rural banks. The data is analysed using panel regression. The study includes two variables; independent and dependent variables. The independent variables are board characteristics (board size, board independence, and board gender diversity), macro-economic factors (GDP growth, policy rate, inflation) and Firm characteristics (size, capital adequacy ratio, liquidity) and the dependent variable is loan delinquency.

1.8 ORGANIZATION OF THE STUDY

In order to present the work adequately, the project is divided into five sections. Chapter 1 consists of an introduction explaining the background of the study, the problem statement, the research objectives, the research questions, the study methodology, the relevance of the study and the limitations. Chapter 2 provides an overview of the literature on the subject, which is divided into sub-themes. Chapter 3 describes the methodology used by the

researcher, i.e. research design, research team and sample, data collection instruments and data analysis procedures. Chapter 4 describes the analysis and presentation of the results. Chapter 5 contains a summary of the results, conclusions, recommendations and suggestions.
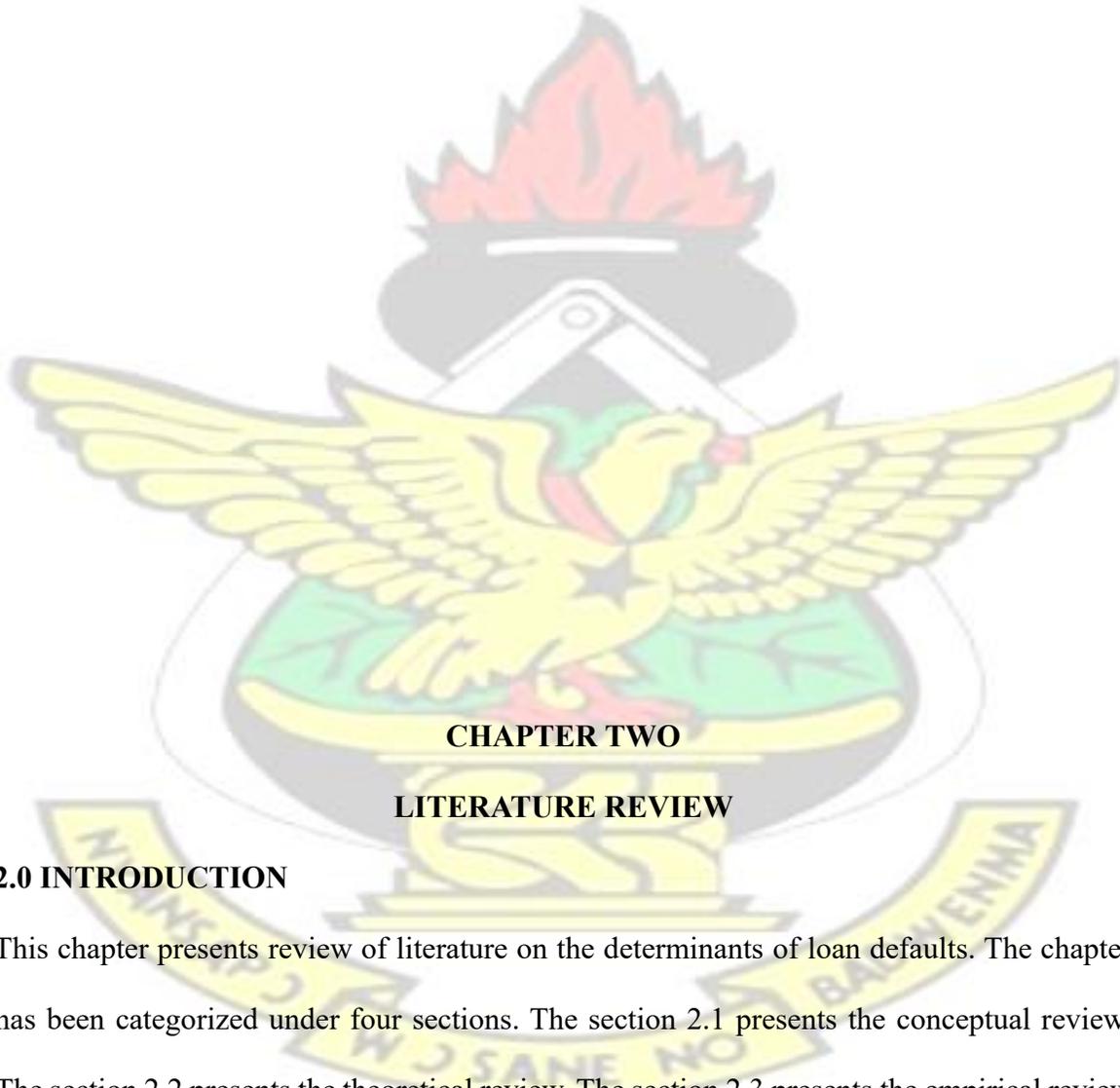
CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter presents review of literature on the determinants of loan defaults. The chapter has been categorized under four sections. The section 2.1 presents the conceptual review. The section 2.2 presents the theoretical review. The section 2.3 presents the empirical review and the section 2.4 presents the conceptual framework and the hypothesis development.

2.1 CONCEPTUAL REVIEW

2.1.1 Loan Delinquency

Loan delinquency (LD) is loans that the bank cannot recover, which increases the risk of losses on these loans and interest rates (Al-Rubaie, 2018). Abdul-Jabbar (2016) also defines loan delinquency as loans that are not repaid according to the repayment schedule agreed with the borrower (Al-Taher, 2018), loans that no longer generate income for the bank or force the bank to reschedule repayments according to the borrower's new terms. This is a loan with a probability of default of 51%. If the probability of repayment is low or zero, it is a non-performing loan. Default is scored because it indicates a high risk of loss, highlights performance problems and helps forecast how much the portfolio will ultimately lose due to default (Pearson and Greeff, 2006; Addae-Korankye, 2014). There are three types of default ratios: the repayment ratio (actual repayments relative to the amount of debt), the default ratio (amount of debt relative to total loans) and the portfolio risk ratio (number of loans not repaid on time relative to total loans)(CGAP, 1999). According to Cheruiyot (2015), a loan account is classified as a non-performing loan if it is non-performing and the borrower is unable to repay the loan on time. Johnston (2022), Debt: Borrower default. Default, on the other hand, means that the borrower finds it difficult to meet the obligations of the loan as it matures (Lakshmypriya, 2013). Default is the inability to repay a loan on time (Isabella, 2019). According to Gebremedhin (2010), loan default is the inability of a borrower to repay a loan on time or at all. According to Bismarck (2015), default is otherwise defined as the unwillingness or inability of the borrower to repay the loan amount on time or the inability of the borrower to repay the loan properly or to honour agreements or contracts between the borrower and the lender.

Erena and Yadeta (2018) define default as a late payment that reduces the likelihood of repayment. A loan defaults when the probability of repayment is minimal (Addae-Korankye, 2014). According to Kari (2016), non-performing loans can also be defined as loans in which principal and interest are not repaid according to the terms of the loan agreement between the borrower and the lender, and most loans are more than 90 days past due. Non-performing loans are loans that are past due by more than 90 days and are also referred to as nonperforming loans, doubtful loans, impaired loans or problem loans. According to Lilian (2013), a loan delinquency is a loan that has not been repaid in full according to the loan agreement. According to Lamichane (2022), a loan delinquency is a loan that has not been repaid. According to Huang (2018), a loan is non-performing if repayment is delayed. According to Mitji (2017), loan delinquency refers to the speed of repayment; if repayment is delayed, the loan becomes a non-performing loan.

Inferring from Ameyaw-Amankwah (2011) there is a delinquency when borrowers are unable to repay the obligation. Thus, the borrowers' compliance with the time or the terms of the debt agreement were not met. Default is the inability to repay a loan. Default occurs when the borrower is unwilling or unable to repay the debt. Default occurs when the borrower fails to meet the terms of the loan, e.g. fails to make required repayments (Murray, 2011). Griffin (2006) define the default risk threshold as a borrower who has missed at least three payments in a 24-month period. This is the point at which the risk that a borrower will actually default and stop all payments increases significantly and is a behavioural indicator. This definition is in line with international standards, as a common definition is necessary for a uniform analysis. This definition does not imply that the debtor is completely insolvent and therefore the debt is subject to collection or litigation, or that the debt is classified as doubtful, doubtful or effectively written off.

2.1.2 Rural Bank

Ofori-Dwumfuo and Botchway-Anang (2012) argue that rural banking is banking in places where bank branches are too far away to be effective. Rural banking is very popular among small villagers and farmers who live far from cities and cannot travel to cities to access banking services. Gradually, 'village banks' have emerged, which are cooperative banking organisations but offer a wider range of services (Afful et al., 2015). Ladzagla (2016) argues that the value of rural banks lies in mobilising savings for rural community extension, promoting rural development, mobilising savings and providing services for agricultural and, depending on the author, non-agricultural activities.

Shekhar and Shekhar (2007) define rural banks as "cooperative banking institutions that provide a wider range of services. Rural banks primarily collect savings from locals and offer credit aids to SMEs such as farmers (Enu-Kwesi et al., 2013). They should also carry out supervised credit programmes, provide additional banking services, provide agricultural inputs and credit, support trade and generally promote the overall development of the banking sector. Rural and community banks are limited liability companies (community banks) established under the Ghana Companies Act 1963 (Act 179) to provide financial intermediation services to their customers (Nair and Fissha, 2010). According to MacnallyBoateng (2016), banking in Ghana, in simple terms, is the provision of banking services to those who live and work in rural areas.

2.1.3 Factors Influencing Loan Default

Loan default as a challenge is not a deliberate act that people intent to indulge in. Nonrepayment may be due to reasons beyond the control of the borrower. For this reason, Brehanu and Fufa (2008) distinguish between intentional and non-intentional reasons for non-payment. However, the purpose of this paper is to explore avoidable factors attributable to borrowers and lenders. In general, evaluation of lenders capacity to offer loans to client should be at heart (Bastos, 2010), taking into account the creditworthiness of the client, the availability of cash transfers, the adequacy of the borrower's collateral and the lending standards set by national and foreign regulators (Barry et al., 2006). Not only the characteristics of borrowers influence the default level however, the attributes of the lender and the loan in action as well fuel the probability of default (Abid et al., 2014; Ghosh, 2015). As this study focuses on corporate borrowers, other classifications of ownership characteristics are also included:

Ownership characteristics: Coravos (2010) indicates that corporate ownership and ownership structure can lead to insolvency. In general, a single owner is more likely to be insolvent than multiple owners. The type of security held by the owner influences the probability of insolvency (Jiménez and Saurina, 2003). An affirmative relationship was found between owner insurance and the probability of insolvency. The probability of default may be positive there is a multiple income sources by the owners (Brehanu and Fufa, 2008). When borrowers have alternative means to generate income beyond the business assets, there is a likelihood that the borrower will inadvertently invest these assets, which could lead to default.

Borrower characteristics: Jimenez et al. (2009) posited that where borrowers are located and their distance from the lending institution can be used as determinants of collateral requirements. The purpose of this paper is to examine the probability of default. In general, tracking is easier and may reduce the probability of default if the borrower is closer to the lender. According to Mokhtar et al. (2012), the age of the borrower is also a potential cause of default. If a company has been in business for a long time, it may have enough experience to manage its finances properly and avoid a potential default. Sometimes experts can be careless, which can result in default; Mokhtar et al. (2012) found a strong positive correlation between the amounts of debt (i.e. additional debt) and the probability of default; Jiménez and Saurina (2003) found the same result. A larger number of debtors increases the pressure on the firm's resources and can lead to insolvency. The size of the firm may also affect insolvency. In general, small firms are more likely to be insolvent than large firms (Brehanu and Fufa, 2008). Jiménez and Saurina (2003) found that the nature of the debtor-creditor relationship depends on the type of insolvency which further contribute the degree of default. Borrowers with good relationships are not interested in defaulting, especially if the borrower encourages them to do so.

Loan characteristics: there are several loan-specific factors that determine the probability of default (Foster and Zurada, 2013). For example maturity of the loan (the age or term of the loan) can lead to default. Loans with longer maturities are more likely to default (Roslan and Abd Karim, 2009). Mokhtar et al. (2012) found that the length of loans can lead to default. Depending on the company's cash flow frequency, the timing of loan management should be matched to the timing of cash flow. It is advisable to repay a business loan in one month or less. The purpose of the loan may lead to non-payment. If the main purpose of the loan is not

business development or direct production of goods or services, the probability of default is high (Khieu et al., 2012). The cost of borrowing or the interest rate as well contributes to the degree of default (Salas and Saurina, 2002). The authors found that interest rates are a determinant of default in the Spanish banking sector.

Lender characteristics: certain factors related to the lender can lead to insolvency (Abid et al., 2014; Louzis et al., 2012).For instance the timing of loan approval matters for the borrower's ability to repay the loan. They report the following. If the loan application process takes an unnecessarily long time, borrowers may miss opportunities that do not meet the purpose of the loan.Herrington and Wood (2003) argue that if borrowers are unable to pay the required amount, they may default.If the financial institution provides less than the applicant has requested, it becomes more difficult to fulfil the purpose of the loan and the borrower cannot fulfil his or her obligations, leading to arrears and unpaid instalments. If the borrower deviates from the goal stated in the loan application, the probability of default increases (Claessend et al., 2005). Banks must therefore check that the purpose for which the loan is intended is proven before granting the loan. The probability of default may be higher if interest is charged on the loan, which is called the 'cost of borrowing'. High interest rates place high demands on borrowers and make repayment more difficult. In this paper, the interest rate is referred to as the cost of credit.

2.2 THEORETICAL REVIEW

2.2.1 Theory of Adverse Selection

Yoon (2009) defines information asymmetry as 'a situation in which one party has more information than the other'. Ekuma (2003) also define information asymmetry as a situation where both parties do not know some important information. The concept of information asymmetry is very important in the relationship between creditors and debtors. Therefore, Mehrteab (2005) explains that a lender's ability to recover principal and interest depends on the probability that the borrower will repay the loan. Lenders are in a very difficult position because they do not pay attention to information and do not provide it in a timely manner; Akerlof (1970) also agrees with this view. According to Akerlof's (1970) 'lemon theory', a seller in a buyers' market is more aware of the quality differences of his product and therefore anticipates how he will sell it to the buyer. Since buyers are not aware of quality differences, they make their offers on the basis of average quality. As a result, sellers may not be able to sell quality products. A good product ends up being replaced by a poor product. In addition, lenders in credit markets do not have sufficient information about the characteristics of borrowers and are therefore unable to distinguish good borrowers from bad ones. Consequently, information asymmetry leads to problems of adverse selection and moral hazard in credit environments (Binks and Ennew, 1992).

According to Akerlof (1970), information asymmetry means that buyers in a given market use the market average as an indicator of the quality of the product, while sellers have more information about the product. Sellers therefore have an advantage because they have more information about the quality of the product than buyers. According to Leitner (2006), information asymmetry means that the borrower has specific information about his

creditworthiness that cannot be observed by the lender. Jappelli and Pagano (2002) write that problems of 'adverse selection' and 'moral hazard' arise in the credit market when lenders do not have the necessary information to distinguish good from bad borrowers. In this paper we use Leitner's (2006) definition. Information asymmetry can be measured by several parameters, such as credit history, sensitive information and proximity to the borrower. Credit bureaus typically collect information about borrowers. The purpose of credit bureaus is to collect, compile, analyse and provide credit information to lenders.

Credit data exchanges offer credit history (data capital) as collateral instead of the usual physical collateral for banks' credit lines. On the other hand, this mechanism is beneficial for banks as it solves the problem of data asymmetry, which is often used to increase the risk premium of loans. It also reduces the problem of moral hazard and adverse selection. In addition to providing the information needed to build a credit history, credit histories permit borrowers to transfer their credit history from one institution to another, making the credit market more competitive and ultimately more accessible (Muli et al, 2013).

The adverse selection problem is based on the assumption that borrowers have better information than lenders about their behaviour and the risks associated with proposed projects or investments. Stiglitz and Weiss (1981) attempt to explain the impact of rising interest rates on the quality of loan portfolios. The theory of adverse selection is based on two assumptions: Lenders are unable to distinguish between good and bad borrowers, and borrowers repay loans only when they can afford to do so.

The model assumes that high-risk borrowers engage in high-risk activities with a low probability of success but a high return on investment, while low-risk borrowers engage in low-risk projects with a high probability of success but a low return on investment. Interest rates can be used to distinguish between high- and low-risk projects, regardless of which type generates the same return. As interest rates rise, low-risk projects begin to generate negative returns. Borrowers will choose to borrow at a higher interest rate only if they can get a higher return (Gosh et al., 2000). Good borrowers leave and bad borrowers stay because they cannot afford higher interest rates; Stiglitz and Weiss (1986) also argue that lenders choose collateral to distinguish between good and bad borrowers. Riskier borrowers offer less collateral because they may lose it if the project fails; Gatak and Ginnan (1999) agree that lenders should require collateral to distinguish bad borrowers from good ones. However, they show that requiring collateral does not always lead to the desired outcome. For example, collateral requirements may not be desirable for loans to poor people, who often do not have sufficient collateral.

2.2.2 Stakeholder Theory

Stakeholder theory is a management theory that proposes that a company is not just responsible to its shareholders, but to a wider group of stakeholders, including employees, customers, suppliers, communities, and the environment. The theory was first introduced by Freeman (1984) and has since been widely accepted in the business world. According to stakeholder theory, a company's success depends on the relationships it has with its stakeholders, and that companies should manage these relationships for the benefit of all parties involved. This means that companies should take into account the interests and needs

of their stakeholders when making decisions, rather than just focusing on maximizing profits for shareholders (Galbreath, 2018).

One way that stakeholder theory explains the relationship between boards and LD is by suggesting that a board should take a stakeholder approach to managing the situation. This means that the board should consider the interests and needs of all stakeholders, including borrowers, shareholders, and the wider community, when making decisions about how to deal with LD (Trung, 2022). For example, a board could take a stakeholder approach by working with borrowers to find a solution that benefits all parties involved, rather than just focusing on recovering the loan for the benefit of shareholders. This could involve restructuring the loan, providing financial assistance to the borrower, or offering other forms of support. Stakeholder theory also suggest that a board should take a proactive approach to managing LD, rather than just reacting to the situation once it has occurred. This could involve implementing policies and procedures to prevent LD from occurring in the first place, such as more stringent lending criteria or regular reviews of borrower creditworthiness.

2.2.3 Credit Channel Theory

The credit channel theory is an economic theory that explains how changes in monetary policy, specifically changes in policy interest rates, can affect the supply and demand of credit in an economy, and in turn, affect real economic activity such as investment and employment. The credit channel theory was first proposed by Bernanke and Blinder (1988). The theory suggests that changes in the policy interest rate can affect the willingness of banks

to lend, and the willingness of borrowers to take on debt. This, in turn, can affect the supply and demand of credit in the economy, and ultimately impact real economic activity such as investment and employment (Wulandari, 2012).

In the context of LD, the credit channel theory suggests that changes in the policy interest rate can affect the level of NPLs in an economy. When interest rates are low, it becomes easier and cheaper for borrowers to access credit, which can lead to an increase in borrowing and investment activity. This increased economic activity can improve the ability of borrowers to repay their loans, thereby reducing the level of LD (Iddrisu and Alagidede, 2020). On the other hand, when interest rates are high, the cost of borrowing increases, and borrowers may be less willing to take on debt. This can lead to a decrease in borrowing and investment activity, which can reduce the ability of borrowers to repay their loans, potentially leading to an increase in LD.

2.2.4 Financial Intermediation Theory

The financial intermediation theory is an economic theory that explains how financial intermediaries, such as banks, facilitate the flow of funds between savers and borrowers in an economy. The theory suggests that banks play a crucial role in the economy by taking in deposits from savers and using these funds to provide loans to borrowers, thereby facilitating economic activity (Ozili, 2019).

The financial intermediation theory was first proposed by economist Tobin and Brainard (1963). The theory suggests that banks play a critical role in the economy by providing

liquidity, maturity transformation, and risk transformation services, which are essential for economic growth and development.

In the context of LD, the financial intermediation theory suggests that banks' capital adequacy levels can affect their ability to provide loans and facilitate economic activity. When banks have high levels of capital, they are better able to absorb losses and continue to provide credit even when some loans turn non-performing. In contrast, when banks have low levels of capital, they may be more hesitant to provide loans, particularly to riskier borrowers, for fear of incurring losses that could threaten their financial stability. This can lead to a decrease in credit supply and economic activity, potentially exacerbating the level of LD in the economy (Ozili, 2019).

2.2.5 Diversification Hypothesis

The diversification hypothesis is an economic theory that suggests that larger, more diversified banks are less prone to non-performing loans (NPLs) than smaller, less diversified banks. The theory posits that by having a more diverse portfolio of assets and a larger customer base, larger banks are better able to spread risks and absorb losses when some loans turn non-performing (Nelson, 1985). The theory suggests that banks that are more diversified in terms of the types of loans they make, the industries they serve, and the regions in which they operate are less likely to experience systemic shocks that can lead to large-scale loan losses. In the context of LD, the diversification hypothesis suggests that larger banks are better able to withstand loan losses than smaller banks. Larger banks typically have more diversified portfolios of loans, which means that the impact of any individual loan loss is relatively small compared to their overall portfolio. This allows them to better absorb losses without affecting their financial stability (Abid, Ouertani and ZouariGhorbel, 2014). In

contrast, smaller banks with less diversified portfolios may be more vulnerable to shocks that affect a specific industry or region, leading to a higher likelihood of loan losses and NPLs. This can be particularly true for smaller banks that are heavily exposed to a specific sector or region.

2.3 EMPIRICAL REVIEW

2.3.1 Board Characteristics and Loan Delinquency

According to Nyor and Mejabi (2013), the researchers looked for a correlation between NPL and several corporate governance indicators. They utilized multivariate regression analysis and concluded that there was no significant correlation between them. They used corporate governance factors such as board size, board composition, audit committee composition, and the separation of authority between the chairman of the board and the managing director.

Nonperforming loans have a negative correlation with board size and composition, but a positive correlation with the composition and power separation of the audit committee, according to their findings.

Pakistan's nonperforming loans has an influence on corporate governance, according to Ahmad et al (2016). An average banking effect, including international private and local commercial and state-owned financial institutions were used in their research. Because corporate governance has a major influence on NPL, they concluded that borrower loan defaults are positively linked with board size and adversely associated with the following variables: board independence, ownership concentration, and government form.

Tadele (2021) looked into whether the board structure of microfinance institutions (MFIs) in sub-Saharan Africa affects how likely they are to go bankrupt (SSA). The article looked at imbalanced panel data from 214 MFIs in 26 SSA countries from 2005 to 2016. The data show that unregulated MFIs with boards that are bigger and more independent are less likely to go bankrupt. Also, unregulated MFIs with a female director tend to have less of a chance of going bankrupt than those without.

Garca, Herrero, and Morillas (2022) looked at how the structure of a company's board of directors affects the chance that a European bank will go bankrupt. From 2002 to 2019, they used panel data analysis to look at 109 European banks that were on the stock market. Merton's (1974) distance to default is used to figure out how likely it is that a loan will go bad. According to the numbers, banks' loan default rates are not influenced by the number of directors on the board and independent directors.

In their research Menicucci and Paolucci (2022) look at how the risk profile of Italian banks from 2015 to 2019 is related to the number of women on their boards. The authors looked at 387 Italian banks and used unbalanced panel data with firm fixed effects and controls for each year to make an econometric model. The results show that banks run by women are less risky because they have more capital adequacy and more equity to assets.

In their study, Kinateder, Choudhury, Zaman, Scagnelli, and Sohel (2021) looked at a sample of 20 listed banks from 2006 to 2017. When BGD goes up by one standard deviation, the

distance to default goes up by 39.80%, the distance to insolvency goes up by 50.97%, and the distance to capital goes up by 38.61%.

Islam (2020) looked into how board composition and activities affect bank loans that are not being paid back (NPLs). The empirical data shows that NPLs are negatively related to the independence of the board, the separation of the CEO's and chairman's roles, directors' financial knowledge, and the number of committee meetings. Also, they come to the conclusion that a big board and a lot of women on it may have helped cut NPLs.

Debt defaults are linked to the size of a company's boards, according to Maina et al. (2016). In addition, independent directors were shown to have a positive and substantial link with nonperforming loans, according to the findings of the research.

2.3.2 Macro-economic Characteristics and Loan Delinquency

Anita, Tasnova, and Nawar (2022) examined selected macroeconomic determinants of nonperforming loans (NPLs) for a panel of eight South Asian Association for Regional Cooperation (SAARC) countries (Afghanistan, Bangladesh, Bhutan, India, Nepal, Maldives, Pakistan, and Sri Lanka) using annual data from 2008 to 2019. The empirical findings confirmed the previous findings, indicating a significant positive relationship between the government budget balance and GDP, sovereign debt, inflation rate, and money supply, and a significant inverse relationship between GDP, sovereign debt, inflation rate, and money supply.

Nigmonov, Shams, and Alam (2022) used probit regression analysis to empirically analyse the important macroeconomic determinants that impact P2P lending default risk. By combining United States (U.S.) state-level data with LendingClub's loan book from 2008 to 2019, this research evaluates numerous characteristics associated with the default probability of loans given by P2P lending platforms. The findings indicate that a higher interest rate and inflation enhance the likelihood of default in the P2P lending market.

Nigamonov et al. (2021) analyse experimentally, using probit regression analysis, the primary macroeconomic determinants influencing credit risk in peer-to-peer (P2P) loan markets. Interest rates and inflation are shown to decrease the chance of default in P2P loan markets. For loans with poor credit ratings, the influence of interest rates on the chance of default was much greater.

Kumar and Kishore (2019) analyse banking and macroeconomic factors influencing the impact of bad loan losses in conventional banks in the United Arab Emirates (UAE) from 2008 to 2009.The study covers the period 2015. All macroeconomic factors, including GDP, economic growth, inflation, internal credit to the private sector, unemployment and public debt, were not found to be significant in determining the level of NPLs, suggesting that the crisis was more of an internal problem for firms than macroeconomic factors.

2.3.3 Firm Characteristics and Loan Delinquency

El-Maude, Abdul-Rahman, and Ibrahim (2017) looked at how bank-specific and macroeconomic factors affected non-performing loans in Nigerian deposit money banks over a five-year period (2010 to 2014). Cross-sectional samples were taken from ten of the fifteen

banks on the Nigerian Stock Exchange (NSE). There are significant positive relationships between NPL, LDR, and Bank Size. There are also significant positive relationships between CAR and Inflation and significant negative relationships between ROA and NPL.

Kücük (2022) looked at monthly data from Turkish deposit banks and macroeconomic variables from 2005:1 to 2021:12. This data is tested using the ARDL bound testing method. If there is a cointegration relationship between the variables, the long run and short run coefficients are found. According to the research, the number of consumer loans that are in default goes up when loan interest rates and unemployment rates go up. On the other hand, the number of late consumer loans goes down when deposit interest rates and the dollar exchange rate go up. Concerning internal variables, it was found that the NPL rate goes down when the CAR requirement and ROA go up.

Wood and Skinner (2018) looked at the reasons why commercial banks in Barbados had nonperforming loans from 1991 to 2015. The results of empirical research show that bankspecific factors like ROE, ROA, CAR, and LDR have a big impact on NPL, while macroeconomic factors like GDP growth, unemployment rate, and interest rate also have a big impact.

Tehulu and Olana (2014) looked into the factors of credit risk that were unique to each Ethiopian commercial bank. For this research, the quantitative research method was chosen. From 2007 to 2011, random effects GLS regression was used to look at panel data from 10

commercial banks, both state-owned and privately owned. The results of the regression showed that credit expansion and bank size had statistically significant negative effects on loan default, while operational inefficiency and ownership had statistically significant positive effects on loan default. The data show that ROA, CAR, and bank liquidity all have a negative but statistically insignificant relationship with loan default.

Khan, Siddique, and Sarwar (2020) looked at the causes of non-performing loans in the Pakistani banking industry from 2005 to 2017. The sample was made up of commercial banks that were listed on the Pakistan Stock Exchange between 2005 and 2017. Calculations were done with STATA software and regression modelling with random and fixed effects. Operating efficiency and profitability have statistically significant negative relationships with NPLs, while CAR and revenue diversification have statistically negligible negative relationships with NPLs.

Puspitasari, Febrian, Anwar, Sudarsono, and Napitupulu (2021) looked at what made rural banks in East Java, Indonesia, more likely to go bankrupt. From 2009 to 2018, monthly and annual financial reports from rural banks in East Java were used as secondary data. The results show that NIM, NPL, operation efficiency, ROA as a proxy for profitability, and ROA as a proxy for profitability all have a big effect on default risk. LDR does not have a significant effect on default risk.

Using the generalized method of moments (GMM) approach, Vinh (2017) did a study and came to the conclusion that nonperforming loans have a negative influence on the

performance of banks and lending behaviour.Asset quality was impaired by a high degree of NPL, and bank size had a negative effect.

Bank-specific NPL factors were studied by Ahmed and Bashir (2013). They looked at ten bank-specific criteria, including the Inefficiency ratio, solvency ratio, loan to deposit ratio, market power ratio, ROA, ROE, Credit growth, total liabilities to income ratio, deposits rate ratio, and reserve ratio. ROA, credit growth, and the reserve ratio all have a positive correlation with NPL, according to empirical evidence. However liquidity had a no effect on NPL.

Khan, Siddique, and Sarwar (2020) investigated the factors that influence loan defaults in Pakistan. The banking industry (i.e., commercial banks) listed on the Pakistan Stock Exchange from 2005 to 2017 is included in the sample. Profitability, operational efficiency, capital sufficiency, and revenue diversification were all examined as banking variables. The calculations were made using STATA software and regression modeling using random and fixed effects. The results demonstrate that operational efficiency and profitability indicators have a negative but statistically significant relationship with NPLs, whereas capital adequacy and income diversification have a negative but statistically insignificant relationship with NPLs.

2.4 CONCEPTUAL FRAMEWORK

The Figure 2.1 presents the conceptual framework. The framework includes the independent variables which are board characteristics (board size, board independence, board gender diversity), macro-economic factors (GDP growth, policy rate, inflation) and Firm

characteristics (size, capital adequacy ratio, liquidity) and the dependent variable is loan delinquency.

```
┌─────────────────────────┐
│  Board Characteristics  │ ─────────────┐
└─────────────────────────┘              │
                                         ▼
┌─────────────────────────┐      ┌─────────────────────┐
│ Macro-economic factors  │ ───▶ │  Loan Delinquency   │
└─────────────────────────┘      └─────────────────────┘
                                         ▲
┌─────────────────────────┐              │
│   Firm Characteristics  │ ─────────────┘
└─────────────────────────┘
```
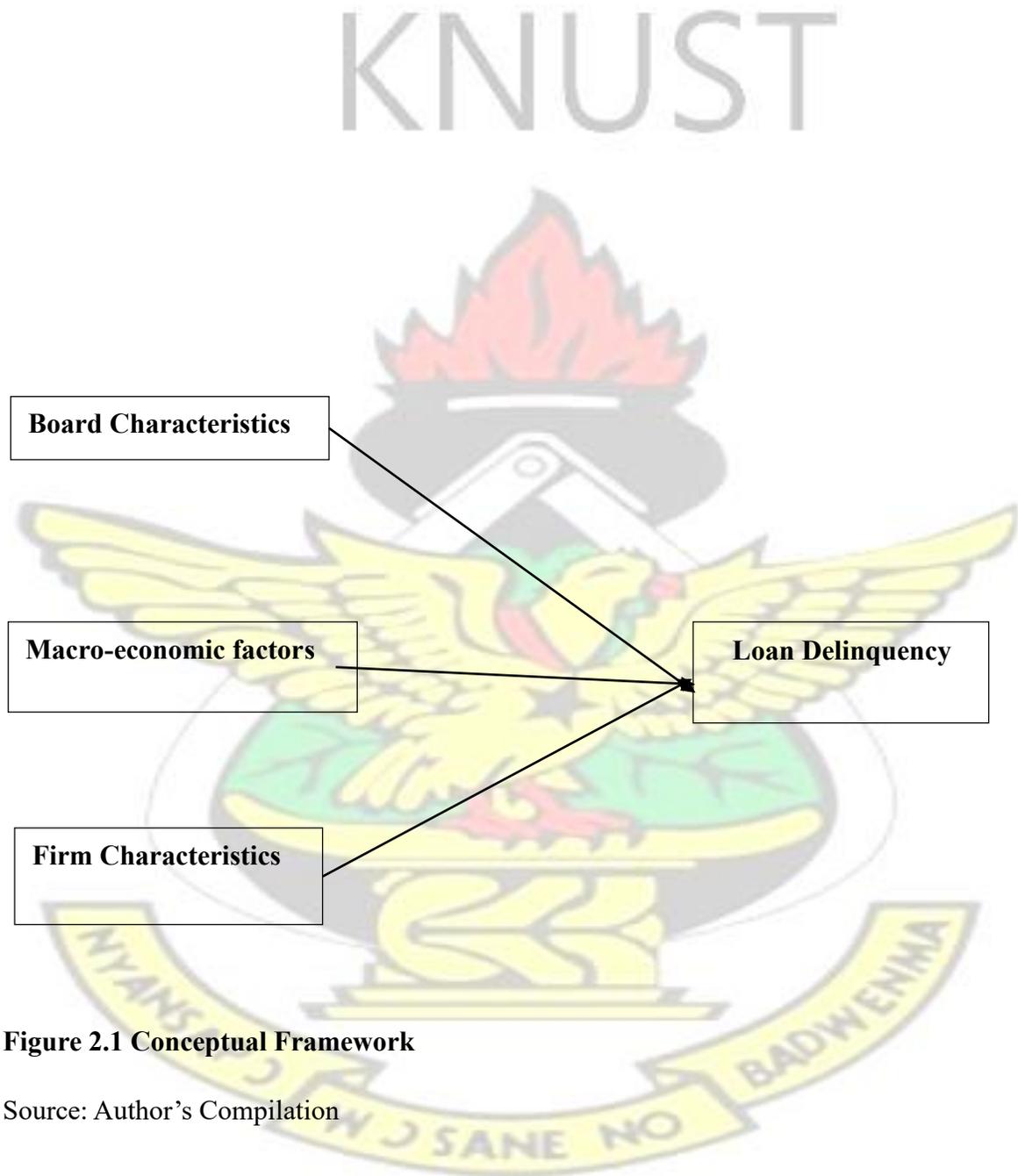
Figure 2.1 Conceptual Framework

Source: Author's Compilation

2.5 SUMMARY

This chapter reviewed literature on previous studies. The chapter defined loan delinquency and its determinants. Also the theory of adverse selection was explained. The empirical studies were summarised according to the objectives of the study and finally the conceptual framework was drawn showing the relationship to be examined.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

This chapter presents the methods and technique methodology required to assess the determinants of loan delinquency among rural banks. The rest of the chapter is structured as follows: the research design, the population of the study, the sample size and sampling procedure, data collection method, data analysis, variables description as well as reliability and validity test.

3.1 RESEARCH DESIGN

Research design is defined as a plan for conducting research in such a way as to best manage factors that may affect the reliability of the results (Saunders et al., 2019). Research design refers to the plans, structures and strategies used to answer research questions and manage bias (Saunders et al., 2019). This study employed the quantitative design because the research questions require the collection of numerical data. Also the research questions

require objectivity and minimization of bias hence this strategy allows for statistical tests to be carried out on the data in a standardised manner to establish statistical significance. The study adopted explanatory research design. This is because the purpose of the study was to explain the relationship determining the loan delinquency. The study is further classified as a desk study study because it involves conducting research and analysis solely based on existing data and information sources that can be accessed from a desk or computer.

3.2 STUDY POPULATION

The population consists of rural banks in Ashanti region. There are twenty-nine rural banks in Ashanti region. The population was selected because Ashanti region has the highest number of rural banks in Ghana (Musah, and Adutwumwaa, 2021) and also due to the geographical location of the researcher.

3.3 SAMPLE SIZE AND SAMPLING PROCEDURE

A sample of 10 rural and community banks were selected. The study used purposive sampling to select the ten banks. The ten banks were selected because these banks made their annual reports available to the researcher since most annual reports of rural and community banks are not available online. The researcher made contacts with the rural and community banks within Ashanti region because the region was in close proximity to the residence of the researcher. After several contacts the researcher was able to get access to data from ten rural and community banks. The data for the period was from 2011 to 2021.

3.4 DATA COLLECTION METHOD

Data has been classified into two – primary and secondary data. Primary data is first-hand data, while secondary data has already been collected by others for other reasons and are available for use (Saunders et al., 2019). This research depended on secondary data. The data was collected from banks' annual reports, Ghana inflation statistics, and Bank of Ghana reports from 2011 to 2021.

3.5 DATA ANALYSIS

Data analysis refers to the process of collecting, modeling and transforming data to provide useful information for decision making and support (Wanjiru, 2013). The software for the analysis was Stata 15. The data was analysed using panel data regression. Time (2011-2021) and company information were included in the dataset, which is often utilized in situations where both time series and cross-sectional components (various firms) are included in the data. There are various benefits to panel data regressions. Since they mix cross-sectional and time-series data, panel information can handle more complicated datasets. This results in a higher degree of flexibility and a greater ability to test. In addition, panel regression may reduce the impact of some of the remaining factors on the regression (Brooks 2019). Using panel data, Gujarati (2004) found that it is possible to better and more accurately evaluate the repercussions of a given action since it gives more information, larger variety, less variable collinearity, higher efficiency, and better dynamic properties.

Pooled regression, fixed effects models, and random effects models are the three most prevalent models for panel data. Pooled Ordinary Least Squares (OLS) is a statistical method used to estimate a linear regression model using pooled cross-sectional data, i.e. combining

data from multiple sources into a single dataset for analysis (Brooks, 2019). Pooled OLS involves using the entire dataset to estimate the coefficients of the independent variables that predict the dependent variable, assuming that the coefficients are constant across all the cross-sectional units. Pooled OLS is mostly ignored because it does not account for the dynamics of the data over time. Pooled OLS assumes that the relationship between the dependent variable and the independent variables is constant over time, which may not be the case. For example, the relationship between interest rates and consumer spending may change during periods of recession or economic growth (Wanjiru, 2013). A fixed effect model is a statistical model that accounts for unobserved time-invariant differences across individuals, firms, or entities. In other words, the model assumes that there are unobserved individual-specific characteristics that affect the dependent variable, and these characteristics are constant over time. The fixed effect model estimates the effects of the observed independent variables on the dependent variable, while controlling for the unobserved individual-specific effects (Brooks, 2019).

A random effect model is a statistical model that accounts for unobserved time-varying differences across individuals, firms, or entities. The model assumes that the unobserved individual-specific effects are randomly distributed across the population, and estimates the effects of the observed independent variables on the dependent variable, while controlling for the individual-specific effects. Unlike the fixed effect model, the random effect model assumes that the unobserved individual-specific effects are not correlated with the observed independent variables (Studenmund, 2014). To choose between the fixed effect and the random effect, the Hausman test is performed. Depending on the findings of the Hausman test, either a fixed or random effects regression of the data is desired and acceptable

(Hausman, 1978). The Hausman test examines whether there is a statistically significant difference between the coefficients of variables in fixed effects regression and the coefficients of variables in random effects regression. Only the fixed effects estimate is consistent if equal coefficients anticipated by the fixed effects model and the random effects model are discarded.

3.5.1 Autocorrelation

Fundamentally, it is presumed that the errors are not connected in any way (uncorrelated with one another). When errors are linked to one another, the connection is referred to as autocorrelation (Brooks, 2019). It is assumed that positive autocorrelation is present if the Wooldridge test is smaller than the lower critical value of 5%, according to Brooks (2019). The null hypothesis states that none of the variables has a first-order autocorrelation.

3.5.2 Multicollinearity

McNabb (2015) notes that correlation analysis allows the researcher to analyse the degree, strength, and direction of the relationship between two variables, provided data beyond the nominal level (i.e., whether it is positive or negative). As stated by Studenmund (2014), multicollinearity occurs when the explanatory variables in a regression are perfect linear functions of one another, a deviation from the minimum OLS requirements. When the variance of the predicted coefficients increases in the presence of a strong correlation, standard errors rise. Using Pearson correlation analysis, both multicollinearity and the relationship between dependent and independent variables were analysed.

3.5.3 Heteroskedasticity

Heteroskedasticity occurs when the variance of the error term is not constant across the range of the independent variable, which can cause problems in statistical inference and hypothesis testing (Greene, 2003). When the number of observations in a sample is greatly altered, it can lead to heteroskedasticity, which is a violation of the assumption of homoscedasticity in the regression model. or the purpose of testing for heteroscedasticity, the heteroskedasticity test devised by Breusch and Pagan (1979) was utilized in this study.

3.6 ECONOMETRIC MODEL

The model for the study was adopted from the studies of Garca, Herrero, and Morillas (2022) and Kumar and Kishore (2019).

$$LD_{it} = \alpha + \beta_1 BSZ_{it} + \beta_2 BI_{it} + \beta_3 BGD_{it} + \varepsilon_{it} \dots (1)$$

$$LD_{it} = \alpha + \beta_1 PR_{it} + \beta_2 IFL_{it} + \beta_3 GDP_{it} + \varepsilon_{it} \dots (2)$$

$$LD_{it} = \alpha + \beta_1 CA_{it} + \beta_2 LIQ_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \dots (3)$$

LD: loan delinquency, Bsz: board size, Bgd: board gender diversity, Bi: board independence, Ca: capital adequacy ratio, Liq: liquidity, Pr: Policy rate, IFL: Inflation rate, GDP: GDP growth

3.7 VARIABLES DESCRIPTION

The variables for the study are presented in this section. The independent variables are board characteristics (board size, board independence, board gender diversity), macro-economic

factors (GDP growth, policy rate, inflation) and firm characteristics (size, capital adequacy ratio, liquidity) and the dependent variable is loan delinquency.

Table 3.1: Research variables

Variables	Measurement	Source
Dependent Variable		
Loan Delinquency	the ratio of non-performing loans to total loans.	(Singh and Sharma, 2016)
Independent Variables		
Board size	Total number of board members	(Tadele, 2021)
Board independence	Percentage of outside directors on the board	(García, Herrero, and Morillas, 2022)
Board gender diversity	Proportion of women directors on the board	(García, Herrero, and Morillas, 2022)
Capital adequacy ratio	The ratio of total equity to total assets	(Khan, Siddique and Sarwar, 2020)
Size	Natural log of total assets	(Küçük, 2022)
Liquidity	Total loans divided by total deposits	(Sanyaolu et al., 2021)
Inflation	Consumer price index	(Egbunike and Okerekeoti, 2018)
Policy rate	Interest rate at which the central bank lends to banks.	(Anita, Tasnova, and Nawar, 2022)
GDP growth	Annual growth of GDP data	(Kumar and Kishore, 2019)

Source: Author's Compilation

3.8 VALIDITY AND RELIABILITY

There are three key considerations that must be considered when assessing the reliability of a research. They include stability, internal dependability, and inter-rater reliability, among others. Internal reliability is the uniformity of the variables (Bryman, 2016). The same indicators were analysed for each of the chosen firms, including board size, independence, diversity, inflation, GDP, and capital adequacy ratio. Inter-rater reliability refers to the use of subjective evaluations to data, which may affect consistency (Bryman, 2016). The dependability of a research is another facet of its validity (Bryman, 2016). As the research relied on information from yearly reports, it is reasonable to presume the results are reliable.
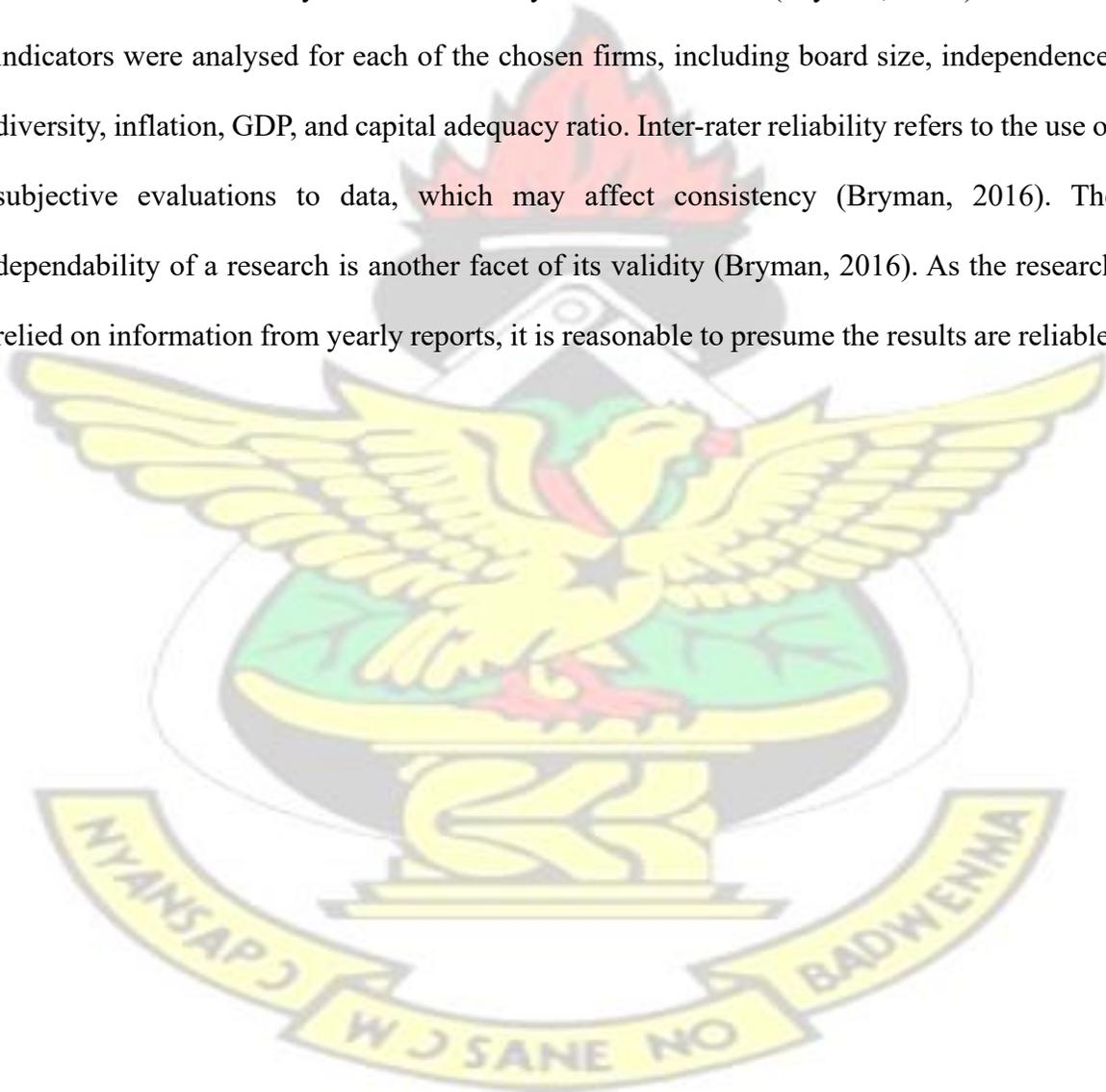
CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 INTRODUCTION

Analytical findings and research conclusions from the preceding chapter are explained in this section. The software for the analysis is Stata 15. Descriptive statistics are displayed first followed by the regression results.

4.1 DESCRIPTIVE STATISTICS

The variable LD (loan delinquency) in Table 4.1 has a mean of 0.04 and a standard deviation of 0.05. This indicates that, on average, the delinquency rate for loans is relatively low, with a moderate level of variability across the time period. Based on Table 4.1 it is seen that the mean board size (BSZ) is 9.08, which falls within the recommended range of 7-14 members for large, complex banks. Therefore, the board size of the rural banks in Ghana appears to be sufficient. In terms of gender diversity, the mean board gender diversity (BGD) is 0.11, which is relatively low compared to the global average of 20%. This suggests that there is room for improvement in terms of increasing gender diversity on the boards of these rural banks.

For board independence (BI), the mean value is 0.79, indicating that on average, the boards of these rural banks are composed of 79% independent members. This exceeds the benchmark of 50% and suggests that these banks have a high level of board independence.

The descriptive statistics suggest that the average liquidity ratio for the rural banks is 0.29, with a standard deviation of 0.06. This indicates that the banks have a moderate level of liquidity. The liquidity ratio benchmark is typically around 30%, which is slightly higher than the mean of 0.286 in this dataset. The mean of the capital adequacy ratio (CA) is 0.03, which is relatively low and indicates that the banks have a low level of capitalization. The minimum regulatory requirement for the capital adequacy ratio in Ghana is 10%, which is much higher than the mean of 0.03 in this dataset. The average size of the banks, as measured by the natural logarithm of total assets, is 17.76, which is relatively large.

Table 4.1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LD	87	0.04	0.05	0.01	0.44
BSZ	87	9.08	1.96	4.00	14.00
BGD	87	0.11	0.10	0.00	0.29
BI	87	0.79	0.06	0.64	0.89
LIQ	87	0.29	0.06	0.03	0.47
CA	87	0.03	0.81	-7.40	0.23
Size	87	17.76	0.70	16.18	19.52
PR	87	18.83	4.49	12.50	26.00
IFL	87	12.41	3.50	7.14	17.45
GDP	87	5.99	3.55	0.51	14.05

Source: Author's Compilation, LD: loan delinquency, BSZ: board size, BGD: board gender diversity, BI: board independence, CA: capital adequacy ratio, LIQ: liquidity, PR: Policy rate, IFL: Inflation rate, GDP: GDP growth

The variable PR (policy rate) has a mean of 18.83 and a standard deviation of 4.49. This suggests that the central bank has kept the policy rate within a relatively narrow range during the time period covered. The variable IFL (inflation) has a mean of 12.41 and a standard

deviation of 3.50. This indicates that inflation has been moderate on average, with a moderate level of variability across the time period. The variable IFL (inflation) has a mean of 12.41 and a standard deviation of 3.50. This indicates that inflation has been moderate on average, with a moderate level of variability across the time period. The benchmark for inflation varies depending on the country, but most central banks target an inflation rate of around 2% to 3% per year. In general, lower inflation rates are better as they indicate that prices are stable and the economy is growing in a sustainable manner. The variable GDP (gross domestic product) has a mean of 5.99 and a standard deviation of 3.55. This suggests that there has been moderate economic growth on average, with a moderate level of variability across the time period.

4.2 MULTICOLLINEARITY TEST

Table 4.2 displays the relationship among the independent variables and that of the dependent variables. The highest correlation among the independent variables is between inflation and policy rate at 0.69. The rule of thumb is that if the relationship is above 80%, then there is multicollinearity. The figure of 0.69 shows that there is no multicollinearity. Again the data shows that BSZ, BI, and GDP have a positive correlation with loan delinquency. Also, BGD, LIQ, CA, SIZE, PR and IFL have a negative correlation with loan delinquency.

Table 4.2: Pairwise correlation

	LD	BSZ	BGD	BI	LIQ	CA	Size	PR	IFL	GDP
LD	1.00									
BSZ	0.01	1.00								
BGD	-0.01*	0.04	1.00							
BI	0.03	-0.21	-0.13	1.00						
LIQ	-0.17	0.37**	-0.21	-0.17	1.00					
CA	-0.31**	0.06	-0.01	0.05	0.45*	1.00				
Size	-0.27	0.23	0.51*8	-0.18	-0.01	0.25	1.00			
PR	-0.09*	0.20	-0.03	-0.24	0.08	-0.01	0.04	1.00		
IFL	-0.01	0.12	-0.15	-0.23	0.02	0.02	-0.18	0.69*	1.00	
GDP	0.18	-0.23	-0.12	0.14	-0.06	-0.07	-0.44**	-0.64*	-0.57*	1.00

Source: Author's Compilation, LD: loan delinquency, BSZ: board size, BGD: board gender diversity, BI: board independence, CA: capital adequacy ratio, LIQ: liquidity, PR: Policy rate, IFL: Inflation rate, GDP: GDP growth, **: 1% significance, *:5% significance

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4.3 HAUSMAN TEST

In order to choose between fixed effect and random effect, the Hausman test was conducted. The results displayed in Table 4.3 shows that the p-value for equation 1 is below the 5% significance level which favours the fixed effect regression. Concerning equation 2 and 3, the p-value is above the 5% significance level. This means that the null hypothesis cannot be rejected hence the results favour the random effect regression.

Table 4.3: Hausman test

Hausman Test	Stat	P-value
Equation 1	6.67	0.04**
Equation 2	0.45	0.93
Equation 3	1.91	0.59

*Source: Author's Compilation, **: 5% significance*

4.4 HETEROSKEDASTICITY TEST

The study tested for heteroskedasticity. The results displayed in the Table 4.4 shows that the p-value is significant at the 1% level. The results imply that the null hypothesis is rejected in favour of the alternate hypothesis. To address the problem of heteroskedasticity, the final regression is estimated using the Drisc/Kraay estimator.

Table 4.4: Cook-Weisberg Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity		
Stat	P-value	Meaning
130.41	0.00***	heteroskedastic

*Source: Author's Compilation, ***:1% significance level*

4.5 AUTOCORRELATION TEST

Table 4.5 shows the results for the test of autocorrelation. It is seen that the p-value is significant at the 1% level, this means that the null hypothesis is rejected in favour of the alternate hypothesis confirming the presence of first order autocorrelation. To address the problem of autocorrelation, the final regression is estimated using the Drisc/Kraay estimator.

Table 4.5: Wooldridge test for autocorrelation

Wooldridge test for autocorrelation in panel data		
Stat	P-value	Meaning
9.82	0.01***	First order autocorrelation

*Source: Author's Compilation, ***:1% significance level*

4.6 PRESENTATION OF RESULTS

Table 4.6 shows the determinants of loan default. The r-square indicates the independent variables explain 18% of the variation in the dependent variable. The p-value of the Wald chi^2 is significant at the 1% level.

Table 4.6: Determinants of loan default

LD	Coef.	Std. Err.	t-stat	P-value

BSZ	0.003713	0.002441	1.52	0.16
BGD	0.061495	0.015665	3.93	0.00***
BI	0.013791	0.047461	0.29	0.78
PR	-0.002850	0.001328	-2.15	0.06*
IFL	0.003135	0.001182	2.65	0.02**
GDP	0.000825	0.000716	1.15	0.28
LIQ	-0.067018	0.044537	-1.5	0.16
CA	-0.013796	0.002139	-6.45	0.00***
Size	-0.016874	0.005166	-3.27	0.01***
Cons	0.319143	0.098399	3.24	0.01
R-square	0.18			
Obs	87			
Wald chi	0.00			

Source: Author's Compilation, LD: loan delinquency, BSZ: board size, BGD: board gender diversity, BI: board independence, PR: Policy rate, IFL: Inflation rate, GDP: GDP growth,CA: capital adequacy ratio, LIQ: liquidity, ***: 1% significance, **: 5% significance, *: 10% significance

4.6 BOARD CHARACTERISTICS AND LOAN DELINQUENCY

The data in Table 4.6 shows that BSZ does not have a statistically significant relationship with LD, as its coefficient (0.003713) is positive but its p-value is high (0.95) which is above the 10% conventional level. The finding of this study relates to Garca, Herrero, and Morillas (2022).

BGD has a statistically significant positive relationship with LD, as its coefficient (0.061495) is positive and its p-value is 0.00. This finding supports the study of Tadele (2021). The positive coefficient for board gender diversity suggests that a more diverse board (with respect to female) is associated with higher levels of loan delinquency. The finding could be explained by the fat that in some rural banks in Ghana, gender diversity on the board is not yet substantial. In such cases, the presence of a few female board members may not be sufficient to bring about the positive impact associated with diverse boards. Instead, it could lead to a situation where the board lacks cohesion, consensus, or effective decision-making, which may contribute to higher loan defaults. Also, the institutional and cultural context in Ghana can play a significant role. Rural banks operate within a traditional framework where gender roles are deeply ingrained. If the inclusion of female board members disrupts traditional power dynamics without proper adaptation, it could lead to conflicts and hinder effective governance.

The finding supports the theory of Adverse Selection. This theory suggests that when lenders cannot easily distinguish between high-risk and low-risk borrowers, adverse selection occurs. Borrowers who are more likely to default may be more inclined to seek loans. If gender diversity on the board leads to a more inclusive lending approach, it might inadvertently attract borrowers who are riskier, increasing the likelihood of loan defaults. In this context, gender diversity might result in expanded access to loans for riskier borrowers.

Table 4.6 further presents the results for board independence. BI does not have a statistically significant relationship with LD, as its coefficient (0.013791) is positive but its p-value is high (0.78). Garca, Herrero, and Morillas (2022) found similar results.

4.7 MACRO-ECONOMIC FACTORS AND LOAN DELINQUENCY

Table 4.6 shows that the coefficient for PR is negative (-0.002850) and statistically significant (p-value=0.06), which suggests that as PR increases, loan delinquency decreases. The finding supports the study of Nigamonov et al. (2021). This finding is explained by the fact that high policy rate can make borrowing more expensive for consumers and businesses, which may lead to a decrease in the amount of loans taken out. Borrowers may also be more cautious with their borrowing behaviour and make payments on time to avoid high interest rates, leading to a decrease in loan delinquency. A high policy rate may also cause banks to be more cautious in lending, as they are likely to face higher borrowing costs themselves. Banks may also have stricter lending standards during times of high interest rates, which may lead to lower levels of loan delinquency (Nigamonov et al., 2021).

The finding supports the credit channel theory. This theory suggests that changes in policy rate affect the lending behaviour of banks, which in turn impacts borrowing by consumers and businesses. A higher policy rate is likely to result in higher interest rates on loans, which may lead to decreased borrowing and a lower level of loan delinquency.

According to Table 4.6 the coefficient for IFL is positive (0.003135) and statistically significant (p-value=0.02), which suggests that as inflation increases, loan delinquency also increases. In other words, higher inflation rates are associated with higher levels of loan delinquency. The finding relates to the study of Nigmonov, Shams, and Alam (2022). Inflation can impact the cost of living and reduce the affordability of loan payments for borrowers. As

the general price level increases, borrowers may face difficulty in making their loan payments, which can lead to an increase in loan delinquency. Inflation can also impact the income of borrowers, particularly if their income is not keeping up with inflation. This can make it harder for borrowers to pay off their debts, leading to an increase in loan delinquency.

The finding supports the theory of adverse selection. Adverse selection occurs when borrowers with higher risk are more likely to seek out loans than borrowers with lower risk. In the case of inflation and non-performing loans, borrowers with higher risk may be more likely to seek out loans in periods of high inflation because they know that the real value of their debt will decrease over time. As a result, lenders may be more likely to lend to riskier borrowers in periods of high inflation, leading to higher levels of non-performing loans.

Table 4.6 further shows that the coefficient for GDP is positive (0.000825), but is not statistically significant (p-value=0.28). This suggests that there is no significant relationship between GDP and loan delinquency. The finding relates to the study of Kumar and Kishore (2019).

4.8 FIRM CHARACTERISTICS AND LOAN DELINQUENCY

From Table 4.6 the coefficient for LIQ is -0.067018, which means that a one-unit increase in liquidity is associated with a decrease in LD of 0.067018 units, holding all other variables constant. However, this coefficient is not statistically significant, as the p-value is 0.16, which is greater than the conventional threshold for statistical significance (0.10). This finding supports the studies of Ahmed and Bashir (2013).

Table 4.6 further shows that the coefficient for CA is -0.013796, which means that a oneunit increase in CA is associated with a decrease in LD of 0.013796 units, holding all other variables constant. This coefficient is statistically significant, as the p-value is 0.000, which is less than the conventional threshold for statistical significance (0.10). Kücük (2022) found similar results.

A possible explanation is that capital adequacy represents the level of financial cushion a bank has to absorb potential losses. Banks with higher capital adequacy ratios may be better able to weather economic downturns or unexpected shocks, such as a sudden increase in loan defaults, without facing insolvency. This, in turn, may reduce the likelihood of loan delinquencies. Banks with higher capital adequacy ratios may be able to attract more depositors and investors, as they are perceived to be safer and more stable. This can result in a lower cost of funds, which can be passed on to borrowers in the form of lower interest rates. Lower interest rates can make it easier for borrowers to meet their debt obligations and reduce the risk of delinquency. Further, banks with higher capital adequacy ratios may be more likely to invest in risk management systems and controls, such as loan monitoring, credit risk analysis, and stress testing. These systems can help identify potential delinquencies early on and allow banks to take corrective actions to mitigate losses.

Financial intermediation theory explains this finding. The theory suggests that banks play a crucial role in the economy by channelling funds from savers to borrowers. According to this theory, banks are able to manage risk through diversification and information asymmetry, and can therefore offer loans at lower interest rates than if borrowers were to borrow directly from

savers. Banks with higher levels of capital adequacy may be better able to manage risk and offer loans at lower rates, reducing the likelihood of delinquency.

Finally Table 4.6 shows that the coefficient for bank size is -0.016874, which means that a one-unit increase in the assets of rural banks is associated with a decrease in loan delinquency of 0.016874 units, holding all other variables constant. This coefficient is statistically significant, as the p-value is 0.01, which is less than the conventional threshold for statistical significance (0.10). The finding confirms the study of Vinh (2017). An explanation for this finding is that larger banks may have a more diverse loan portfolio, which could reduce their exposure to risk. Diversification allows banks to spread their loan portfolio across different sectors and geographic regions, reducing the impact of negative events on any single loan or borrower. In contrast, smaller banks may have more concentrated loan portfolios, making them more vulnerable to shocks in specific sectors or regions. As a result, larger banks may be less likely to experience high levels of loan delinquency than smaller banks. Second, larger banks may have greater resources and capabilities to manage risk than smaller banks. For example, larger banks may have more sophisticated risk management systems and better access to data and information, allowing them to identify and mitigate risk more effectively. In contrast, smaller banks may have fewer resources to devote to risk management and may be more reliant on individual judgement rather than formal risk management practices.

Finally, the diversification hypothesis explains this finding. It suggests that larger banks have more diversified loan portfolios, which reduces the overall risk of their loan portfolio. As a result, larger banks may have lower loan delinquency rates than smaller banks. This theory is

consistent with the idea that larger banks have more resources and capabilities to manage risk and may be better positioned to mitigate the impact of negative events on their loan portfolio.
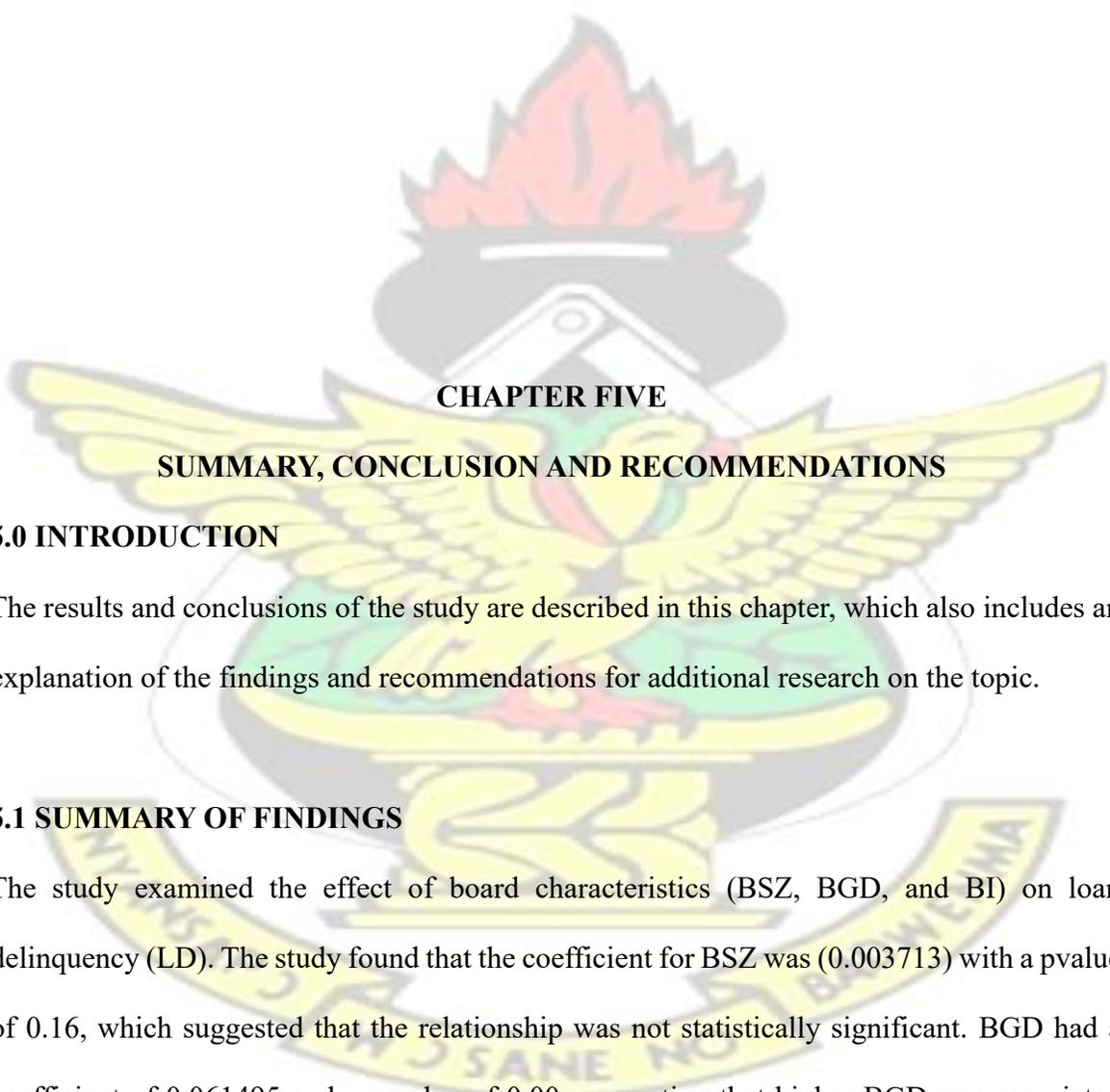
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 INTRODUCTION

The results and conclusions of the study are described in this chapter, which also includes an explanation of the findings and recommendations for additional research on the topic.

5.1 SUMMARY OF FINDINGS

The study examined the effect of board characteristics (BSZ, BGD, and BI) on loan delinquency (LD). The study found that the coefficient for BSZ was (0.003713) with a pvalue of 0.16, which suggested that the relationship was not statistically significant. BGD had a coefficient of 0.061495 and a p-value of 0.00, suggesting that higher BGD was associated with higher levels of loan LD. The study further found that BI did not have a statistically

significant relationship with LD, as its coefficient was 0.013791 and its p-value was high (0.64).

The study examined the effect of macroeconomic characteristics (PR, IFL, and GDP) on LD. The study found that the coefficient for PR was negative (-0.002850) and statistically significant (p-value = 0.06), which suggested that higher levels of PR were associated with lower levels of LD. The coefficient for IFL was positive (0.003135) and statistically significant (p-value = 0.02), which suggested that higher inflation rates are associated with higher levels of LD. The coefficient for GDP was positive (0.000825) but was not statistically significant (p-value = 0.28). This suggested that there was no significant relationship between GDP and LD.

The study examined the effect of firm characteristics (LIQ, CA, and size) on LD. The coefficient for LIQ was -0.067018, but it was not statistically significant (p-value = 0.16). This suggested that there was no significant relationship between LIQ and LD. The coefficient for CA was -0.013796 and statistically significant (p-value = 0.00), which suggested that higher levels of CA were associated with lower levels of LD. Finally, the coefficient for SIZE was -0.016874 and statistically significant (p-value = 0.02), which suggested that higher levels of SIZE were associated with lower levels of LD.

5.2 CONCLUSION

The findings of this study highlight several important factors influencing loan delinquency among rural banks in the Ashanti region of Ghana. Board gender diversity was found to have a significant positive relationship with loan delinquency, indicating that as the proportion of

women on boards increases, loan delinquency also increases. This unexpected result may suggest the need for further investigation into the dynamics and effects of gender diversity on rural bank boards in Ghana.

Moreover, macroeconomic factors such as the policy rate and inflation showed significant relationships with loan delinquency. A higher policy rate was associated with lower levels of loan delinquency, while higher inflation rates were linked to increased loan delinquency. These findings emphasize the importance of macroeconomic policies in shaping the lending behaviour of banks and borrowers.

Furthermore, firm characteristics such as capital adequacy ratio and bank size demonstrated significant associations with loan delinquency. Higher capital adequacy ratios and larger bank sizes were correlated with lower loan delinquency rates, suggesting that stronger financial positions and larger scale operations may contribute to better risk management and reduced loan delinquency among rural banks.

However, the lack of significant relationship between some of the variables and LD highlights the complexity of this issue and the need for further research in this area.

5.3 RECOMMENDATIONS

Rural banks should provide gender-diverse boards with training and resources to enhance their understanding of risk factors specific to the rural banking context. This training can help board members make informed decisions regarding lending practices.

Rural banks should increase capital adequacy. Rural banks can increase their capital adequacy by retaining earnings, issuing new shares or debt, or reducing their risk-weighted assets. They

can also implement more conservative lending practices and risk management policies to reduce the likelihood of loan losses.

Rural banks should improve risk management practices. They can implement more robust risk management practices to identify, assess, and monitor risks. This includes developing and implementing risk management policies and procedures, establishing risk limits and controls, and using advanced risk management tools and technologies.

Rural banks should increase access to funding sources. They can increase their access to funding sources by diversifying their funding base and establishing relationships with a range of wholesale funding providers. This can help reduce their cost of funding and increase their ability to lend at competitive interest rates.

5.4 RECOMMENDATION FOR FURTHER STUDIES

Further studies can examine the impact of other board characteristics on loan delinquency: While the study examined the effect of board size, gender diversity, and independence on loan delinquency, there are other board characteristics that could also be explored, such as board tenure or board diversity in terms of skills and expertise. Also, the study focused on macroeconomic and firm-level factors, but there may be non-economic factors that could also influence loan delinquency, such as cultural or social factors so further studies can explore it. Future research could expand the scope by including more rural banks across different regions in Ghana or exploring the impact of loan delinquency on the broader economy.

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APPENDIX

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Regression with Driscoll-Kraay standard errors    Number of obs     =        87
    Method: Random-effects GLS regression           Number of groups  =        10
    Group variable (i): id                          Wald chi2(9)      = 493700.60
    maximum lag: 2                                  Prob > chi2       =    0.0000
    corr(u_i, Xb) = 0 (assumed)                     overall R-squared =    0.1772
```

		Drisc/Kraay				
LD	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
BSZ	.0037129	.0024411	1.52	0.159	-.0017262	.009152
BGD	.0614945	.0156648	3.93	0.003	.0265911	.0963979
BI	.0137908	.0474611	0.29	0.777	-.0919591	.1195406
PR	-.0028501	.0013283	-2.15	0.057	-.0058098	.0001097
IFL	.0031348	.0011823	2.65	0.024	.0005006	.0057691
GDP	.0008249	.0007161	1.15	0.276	-.0007706	.0024204
LIQ	-.0670182	.0445367	-1.50	0.163	-.166252	.0322157
CA	-.0137962	.0021386	-6.45	0.000	-.0185613	-.0090311
Size	-.0168735	.0051656	-3.27	0.008	-.0283831	-.0053639
_cons	.319143	.0983989	3.24	0.009	.0998967	.5383893

sigma_u	
	0
sigma_e	.04488775
rho	0	(fraction of variance due to u_i)