AN EXAMINATION OF THE ROLE OF CAPITAL STRUCTURE IN ENHANCING FINANCIAL PERFORMANCE: EVIDENCE FROM BANKING SECTOR OF GHANA

ABSTRACT

The study used data from Ghana's banking sector to investigate the influence of capital structure in improving financial performance. The study used a descriptive research approach to achieve these goals. A sample of ten (10) banks was analyzed from a population of banks registered on the Ghana Stock Exchange. ADB, Trust Bank Limited, Access Bank, Cal Bank, Republic Bank, Standard Chartered Bank, Ecobank, Fidelity Bank, GCB Bank, and Société Générale Ghana Limited were among the banks that were chosen. Only secondary data was used in the study, which included yearly reports of bank financial statements from 2009 through 2020. In addition, panel regression was utilized to analyze the data, and the results were interpreted using the random effect model's findings. The study found that capital structure had a statistically significant positive effect on bank Net Profit Margins ($\beta=0.2133$, t=5.72, p<0.05), ROA ($\beta= 0.0587$, t=15.44, p<0.05) and ROE ($\beta= 0.3985$, t=6.88, p<0.05) of banks. As a result, it was recommended that to improve bank financial performance, management makes decisions about funding operations using internal funds rather than borrowing, because borrowing reduces bank profits, so lowering financial performance.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

In recent times, a highly competitive, dynamic, and vibrant business environment has characterized the world where various stakeholders have found interest in a company. The ability of a business to compete well in the business market and to satisfy its stakeholders depend highly on how well it manages its financial performance (Ayadi, 2019). However, various financial performance (FP) metrics are taken as very important business factors that are useful in monitoring and measuring an organization's interests.

Capital structure (CS) is a FP metric influenced by the financial support of a business which depends on funds generated from both internal and external sources (Markova et al., 2019). However, the FP of businesses depends on how well a company can manage its debts and equity from the various financial sources to achieve maximum profit. Thus, depending on the source of funds for a business's operations, business organizations develop their financial structure by combining their debts and equity. Capital structure is therefore described as a mixture of debt and equity utilized by an organization to provide financial assistance for the company's operations and growth (Nenu et al., 2018). It (capital structure) is typically made up of debt, stock, and preferred shares issued to raise capital for a company's long-term operations.

As the global south seeks to strengthen its private industries, inadequate debt and equity capital may hinder the sustainability and growth of firms, particularly in Africa (Yinusa et al, 2019). One of the most pressing issues confronting managers is determining the best debt and equity mix to establish an optimal CS that lowers a company's cost of capital while maximizing shareholder

return (Awunyo-Vitor & Badu, 2012). The equity of an organization's CS rises from its ownership share as well as claims to the cash flow and profits in the future.

Debt, on the other hand, is incurred through bond issuances or loans. Overall, debt holders are primarily interested in their principal and interest payments, and they are not committed to the company in the long-term, whereas equity holders are involved in the company for a long term, and the excess reserved earnings are used to fund the company's capital outflows, resulting in a regular dividend from the company (Prasad, 2019). Capital structure decisions are vital in financial and non-financial institutions, and therefore regulators are interested in the capital adequacy of these institutions to ensure their stability, especially banks (Doku et al., 2019). The banking sector is very susceptible to fluctuations in financial leverage as a result of the small amount of equity capital to total assets (Sivalingam and Kengatharan, 2018). They further stated that banks must come up with an appropriate means to determine the amount of capital that account for a large percentage of their financial resources.

The CS of banks in Ghana is geared towards high debt and low equity, which makes the study of the impact of debt on their FP very interesting (Gatsi, 2012). Ghana's banking sector has undergone recapitalization schemes. This exercise, according to the Central Bank of Ghana, is intended to make the banks grow, ensure sustainability and resilience to enhance the economy of Ghana (Obuobi et al, 2020). They mentioned that the Bank of Ghana in 2017 upped the minimum capital of operating banks from 120,000,000 Ghana cedis to 400,000,000 Ghana cedis as part of the banking sector reforms. Some banks were able to raise the requisite capital, while other banks were unable to do so and merged. On other hand, those who were experiencing severe liquidity issues winded up (Musah, 2017). He reiterated that it is imperative for bank managers to carefully

look into the link between leveraged CS and FP to make informed decisions regarding the optimal debts and equity mix for their business.

As a result, the CS of an organization has a huge impact on its FP. The CS forms a major parameter that helps to direct business organizations in the capital markets. The company's CS affects its FP in various ways, as evidenced by results obtained by existing research works (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016; Siddik et al., 2017). While these research works are largely focused on non-financial firms, the concept of CS and its optimal level or benefit of ensuring financial leverage can be applied to the financial firms or the banking sector. This is because the banking sector is one sector that uses a high amount of leverage to create value since its operating revenues are derived from lending and borrowing activities (Widyastuti et al., 2019). These revenues are what primarily examine the potential performance and profitability of banks. Also, from the perspective of banks, the ability to use a high amount of leverage to create value is based on their commands and size, which is subsequently determined by the number of branches they operate (Widyastuti et al., 2019).

Various studies (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016; Siddik et al., 2017) have, therefore, been done to look into the impact that CS has on bank performance.

Different studies (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016; Siddik et al., 2017) used different approaches and methodologies, and they all had varying opinions about the findings. Here, Siddik et al. (2017) evaluated the link between CS and bank performance in Bangladesh and postulated that CS had a substantial effect on the performance of the banks negatively. The study specifically showed that CS did not improve the banks' returns on assets and returns on equity. Marandu and Sibindi (2016) evaluated the correlation between CS and bank profitability

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in South Africa and discovered that it (capital structure) improved the return on assets of the bank, while not improving much of the return on equity of the banks. In Ghana, Owusu-Antwi et al. (2016) conducted research on CS and company performance. Findings from the study revealed that macroeconomic variables such as inflation influence the correlation between CS and FP. The function CS plays in a business organization are broad as it affects various aspects of FP.

Following the above-mentioned studies (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016; Siddik et al., 2017), it is noted there is a significant correlation between bank's CS and FP, even though the findings of these studies are contradictory (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016, Siddik et al., 2017).

The mixed evidence prompts the need to investigate and prove how the CS is pertinent in enhancing banks' FP.

Moreover, the banking sector of global south economies such as Ghana is critical to the country's economic development process, so studying the performance of its banking sectors is more important.

1.2 Problem statement

Many researchers and academicians have strived to establish the link between CS and firms' performance. Considering this, to optimize firm value, firms, including financial firms must carefully analyze their CS decision, which seems to be a difficult task given that leverage usage differs from one firm to the next. Thus, firms typically attempt to obtain the best debt-to-equity ratio in their CS.

However, this is not the case in the studies conducted by Marandu & Sibindi (2016), Owusu-Antwi et al. (2016) as well as Siddik et al. (2017). Here, the gap identified is that although these studies (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016; Siddik et al., 2017) established the link between the CS and bank performance. However, it was worth mentioning that they (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016; Siddik et al. 2017) did not concentrate on how CS affected different types of profitability ratios of commercial banks, hence total debt to total asset ratio on gross profit margin, net profit margin, return on assets and return on equity. Furthermore, there are few studies relating to the relationship between CS and bank FP in the global south, particularly Ghana. Almost none of them are focused on how CS affects different profitability ratios such as total debt to total asset ratio on gross profit margin, net profit margin, return on assets and return on equity and there is a scarcity of research on the effect of the aforementioned profitability ratios. Thus, various research approaches must be applied to solve the research problem to enhance the validity and reliability of results obtained for the problem.

Bridging the research gaps from existing literature (Marandu & Sibindi, 2016; Owusu-Antwi et al., 2016; Siddik et al., 2017) will help to create a better understanding and generalization of results obtained to tackle the research problem. For this reason, the current study examines the role of CS in enhancing FP with evidence from the Ghanaian banking sector.

1.3 Objectives of the Study

The main object of this research is to examine the role of capital structure in enhancing FP with evidence from Ghana's banking sector.

1.4 Research Questions

I.   What effect does the total debt to total asset ratio have on gross profit margin in Ghana's banking sector?

II. What effect does the total Debt to Total Asset Ratio have on Net Profit Margin in Ghana's banking sector?

III. What effect does the total Debt to Total Asset Ratio have on Return on Assets in Ghana's banking sector?

IV. What effect does total Debt to Total Asset Ratio on Return have on Equity in Ghana's banking sector?

1.5 Hypotheses of the Study

In light of the research objectives, the below hypotheses were created:

H1: there is no statistically significant impact of Total Debt to Total Asset Ratio on Gross Profit Margin in the banking sector of Ghana.

H2: there is no statistically significant impact of Total Debt to Total Asset Ratio on Net Profit Margin in the banking sector of Ghana.

H3: there is no statistically significant impact of Total Debt to Total Asset Ratio on Return on Assets in the banking sector of Ghana.

H4: there is no statistically significant impact of Total Debt to Total Asset Ratio on Return on Equity in the banking sector of Ghana.

1.6 Significance of the study

Results from the current research will provide various relevance. First, results from the study will serve policymakers such as government agencies, international communities, and development agencies to enhance their policy formulation. Also, practitioners such as organizational managers and employees will benefit from the study topic by gaining insight on the best decisions to make concerning the total debt to total asset ratio. Lastly, the findings from the current research will be a point of reference for researchers and academicians who want to carry out future studies about the study topic. The study will also contribute to already available literature about CS and FP.

1.7 Scope of the Study

The research is conducted by using institutions from the banking sector only and involves banks listed on Ghanaian Stock Exchange. The research was confined to using secondary data obtained from the websites of the banks and Ghana stock exchange respectively.

1.8 Organization of the study

In this research, there are five chapters labelled chapters one, two, three, four, and five. Chapter one introduces the study along with the purpose and research questions of the study. Chapter two thoroughly discusses theoretical work as well as empirical literature relating to the study topic. used to collect and analyze the study's data. Chapter four analyses and discusses the data gathered from the data collection process. The final chapter summarizes, concludes, and makes recommendations regarding the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter includes an overview of the literature that focuses on addressing the research questions. As a result, the chapter includes sections on conceptual review, study theories, empirical review, conceptual framework, and a chapter conclusion.

2.1 Conceptual review

This section provides an overview of the study's key concepts. The conceptual review is intended to provide a thorough background on the subject by delving into these concepts. Thus, the section gives an insight into the CS and its components, the meaning of FP, and an overview of bank performance in Ghana.

2.1.0 Meaning of CS

The decision regarding CS takes up an important place in the management of a company. Because a company's decisions with regards to the use of various forms of finance result in a varying CS, each of which has a unique impact on a company's performance. Several scholars have shared their understanding of the CS. Kibrom (2010) defines CS as a firms' long-term source of funds employed to finance its business operations in meeting its strategic objectives. This implies that the choice of capital is very crucial when making financing decisions, as it is attributed to a company's risk and returns. Capital structure, on the other hand, refers to a company's mix of various sources of funding, which may include preference shares, reserves, equity capital, and debt. Companies, for example, can fund assets using either debt or equity. Nenu et al. (2018), on the other hand, believe that a mix of debt and equity financing is the best approach.

CS, according to Hassan and Samour (2015), is the mix of debt and equity instruments used to obtain financing. Doorasamy (2021) explains that CS indicates the manner that a business finances its operations based on a debt-to-equity ratio. This suggests that businesses operate on a level ratio that could be low or high. Likewise, Gallo (2015) reveals that a high ratio shows that the business operations are largely financed by borrowed money whilst a low debt to equity ratio implies financing through debt lending. Thus, debt represents borrowed money that is due back to the lender normally, with interest expense and equity represents money belonging to shareholders without the need to pay back any investment (Gallo, 2015). According to Doorasamy (2021), businesses decide on the type of CS to work with and thus, the use of a specific CS is dependent on several factors. These are the conditions of the market, nature of business, the attitude of investors, regularity of earnings among others.

The choice of CS can be associated with the level of debt maturity, which tends to affect performance. In line with this, Popov et al. (2018) elaborate that businesses invest more when they experience debt maturity. This implies the level of CS of a business has also determined its profitability as indicated by Marandu and Sibindi (2016) study. To finance their operations, firms consider using either short-term loans or long-term loans as financing options.

2.1.1 Components of capital structure (CS)

A company's CS focused on the long sources of funds it uses to fund its operations. The various sources are divided into two categories: debt capital (borrowed funds) and owned capital (funds from shareholders) (Thi & Phung, 2021).

Borrowed funds

Borrowed funds in a company's CS refer to monies raised from outside sources in the form of credit or loans also known as debt capital. Borrowed funds are the company's outside liabilities

that require the payment of fixed interest continuously as part of the CS. However, the safest type normally regarded is the long-term debt since the firm has adequate time to repay the principal while settling the interest in instalments (Aljamaan, 2018). Furthermore, Nawi (2015) states that borrowed funds allow for greater flexibility in the CS of a company because they can be redeemed whenever needed as well as provides tax benefits in the form of deductions although it creates a burden on the business. The various sources of borrowed funds include long-term loans, debentures, and public deposits (Aljamaan, 2018).

i. **Debentures** - Debenture capital is a form of borrowed capital. Thus, a debenture is an acknowledgement of loans raised by a company indicating that the company is chargeable to pay a specified amount plus interest at a predetermined date. As such, the debenture holders are the company's creditors. For the convenience of investors, various types of debentures are issued. Moreso, the debentures have a high-interest rate and are not collateralized (Anebo, 2019).

ii. **Term loans** - Term loans are monies obtained by an organization from other financial institutions and banks at a fixed interest rate. These loans are usually medium-term and long-term loans, which are payable in instalments and the organization seeking the loan, has to offer collateral security. As such, organizations in good financial positions and seeking funds can easily do so using term loans (Peria & Schmukler, 2017).

iii. **Public deposits** - Public deposits are funds received as a deposit or loan by a non-banking company from the general public, which includes the company's customers and shareholders other than in the form of debentures and shares, as well as employees. Also, public deposits can be used for debt financing. Again, companies prefer this method since deposits are unsecured and mostly last for up to 3 years (Marandu & Sibindi, 2016).

Shareholder's Funds

Shareholder funds as a constituent of the CS represent the company's capital, as the funds are supplied by the owners of the company. Thus, the owners bear the real risk although they also reap rewards (Etale & Ekpulu, 2019). Again, their liability is restricted to the capital contributed by them (owners). Again, the shareholders' funds could either be in the form of issuing shares to raise capital or using retained earnings to cover the expenses of the business. Shareholder funds can come from a variety of sources, including preferred capital, equity capital, and retained earnings (Olubukola Otekunrin et al., 2020).

i. **Preferred capital** - Preferred capital or preference shares carry preferential treatment as to payment of dividends and have priority over equity shares for return of capital when the company is liquidated (Williams, 2011). Also, the preference shareholders are owners of the business who get preferential treatment when it comes to dividend payments and capital repayment. Preference shares have a predetermined dividend hence, the preference shareholders are cautious investors. According to Kumar (2014), preference shareholders have limited voting rights and have control of the operations, unlike equity shareholders. Preference shares can be redeemed or non-redeemable, convertible or nonconvertible, and cumulative or non-cumulative. . The issuing company of the redeemable preference shares can buy back by the shares at any time during the maturity period. In terms of non-redeemable preference shares, the company that issued them cannot buy back the shares until the organization has the resources needed to stay in operation (Yarko, 2020). On the other hand, cumulative preference shares have their dividends paid when the funds are available thus, paid later whilst non-cumulative preference shares have no dividends paid thus, they are lost forever (Garett, 2013). With convertible preference shares, they can be changed to equity shares and the non-convertible preference shares are as preferred capital (Kim, 2018).

ii. **Equity capital** - The principal source of financing business activities is equity capital, which is provided by equity shareholders. In other words, equity shares are shares that get dividends and repayment of capital after it is paid back to preference shares. The ultimate risk associated with ownership is borne by the holders of such shares. Also, equity shares carry dividends at a fluctuating rate depending on the profits earned by the company (Alalade et al., 2015).

iii. **Retained earnings** – It is the portion of the profit that is kept by the organization to meet future financial needs and for business expansion. Thus, retained earnings refer to the total sum of profits realized over the years and reinvested back into the organization. In other words, it is referred to as ploughing back of profits or self-financing (Yemi & Seriki, 2018).

The diagram below shows the components of CS.
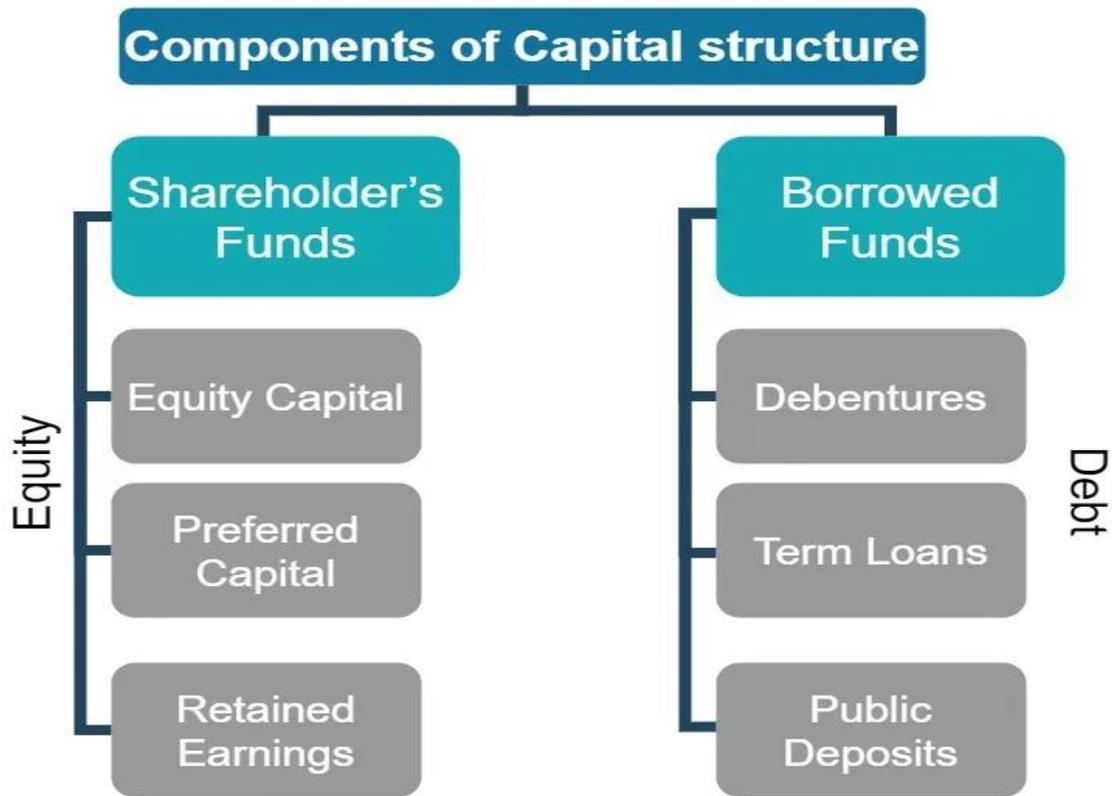
Figure 2.1: components of capital structure

Source: Thi & Phung (2021).

2.1.2 Meaning of financial performance (FP)

Financial performance denotes the outcome of use, mobilization, and management of capital in an organization (Albertini & Berger-Remy, 2019). The FP of organizations is a broad economic indicator that shows the extent to which production factors are utilized (Egbunike & Okerekeoti, 2018). Verma (2021) defines FP as a metric used to quantify the monetary value of an organization's operations and policies. Financial performance is explained as the ability of a function of a firm to obtain and manage its resources in diverse ways aimed at developing a competitive advantage (Nguyen et al., 2021). According to Saad and Zhengge (2016), FP

emphasises variables linked directly to the financial report. Also, Kharatyan et al. (2014) added that there are numerous factors of assessing a company's FP and these indicators include Return on Assets (ROA), Return on Investment (ROI), Return on Equity (ROE), and Earnings per Share (EPS).

Return on assets, return on equity, and return on sales are all ways to measure FP, according to Batchimeg (2017). The efficiency with which a company uses its resources is shown by return on assets (ROA), whereas the return on equity (ROE) indicates how much profit investors make on their investments (Batchimeg, 2017). The FP of a company, according to Stobierski (2020), reflects its capacity to manage its assets. This is mostly determined by the balance sheets or financial statements, as well as the profit and loss statements issued by the board of directors to report to its shareholders. . Additionally, Dufera (2010) explained that financial statement analysis is critical in helping evaluate the FP of a company. This is done by extracting useful performance ratios which help in identifying the flaws and taking the necessary actions to improve performance. According to Dinh and Pham (2020), a way of understanding the FP of an organization is to gather insight into its business performance. This can be done by calculating ratios used to measure performance trends of companies over a period and comparing them with other organizations. Again, performance is a cycle of company activities to achieve objectives which are measured from the appreciation of what the business owns or controls as at the end of the reporting date (Dufera, 2010).

2.1.3 Overview of bank performance in Ghana

Ghana's banking sector is relatively new when compared to the banking sectors of developed countries (Korboe, 2019). The banking sector of Ghana is made up of nationwide licensed and

statutory financial institutions that operate under the banking laws of the country (Nkegbe & Ustarz, 2015). The Bank of Ghana is the central bank that controls all bank activities. Performance and subsequently, profitability in the banking sector has been mixed. For instance, in 2005, the net interest margins of banks had declined from 9.6% to 6.5%. By the end of 2009, the profitability ratios such as the return on assets (ROA), return on earning assets and return on equity (ROE) had been steadily declining (Nkegbe & Ustarz, 2015). However, in recent years, particularly in the early 2010s, the banking sector had remained solvent, liquid and lucrative for a while (Bank of Ghana, 2012). This was not long until the collapse or closure of seven banks in a banking crisis that hit the sector. Inefficient banking practices along with lax oversight and regulation by the central bank (Bank of Ghana) had adversely affected the stability of financial institutions. In 2015, UT Bank Limited and Capital Bank Limited, both among the seven banks that were closed down, had received liquidity support of 860 million cedis and 620 million cedis respectively from the central bank (Nyalatorgbi, 2018). In August 2017, the central bank had no choice but to ask state-owned bank GCB Bank Limited to take over the liabilities and chosen assets of these banks due to rising non-performing loans, as well as their inability to meet the capital adequacy requirements (Nyalatorgbi, 2018). This also led up to the dissolution of five other banks, where one of them, UniBank, took amounts totalling 3.1 billion cedis between 2015 and 2015, all of which were not collateralised (Nyalatorgbi, 2018). This action posed risks to the central bank itself.

Overall, the performance of banks in Ghana has been such that it is pleasing at times and then not pleasing at certain times. The performance of these banks is particularly important and of much interest to investors and policymakers because a bad performance may lead to a loss of confidence and at the same cause these investors and customers to engage in panic withdrawals. In the same

way, the good performance of these banks tends to improve the confidence of investors and customers in the financial sector of the country.

2.2 Theoretical review

The connection between a bank's financial structure and its FP has been the subject of numerous theories. The theory of pecking order and the notion of agency costs were used to support the relationship in this case.

2.2.0 Agency costs

Agency costs are a concept that explains the causes of dissatisfaction between the principal and an agent (Siddiqui, & Afzal, 2012). However, Panda and Leepsa (2017) indicated that the cost of both debt and capital is affected by the agency cost in the CS. The cost associated with equity includes the agent's bonding expenditure (manager), as well as reduced welfare for the principal because of diverging the agent's decision from those that maximize the principal's welfare (Huu Nguyen et al., 2020). Florackis (2008) stated that debt issuing motivates managers to invest their resources into higher-risk projects to generate high returns irrespective of the risk involved. The agency cost associated with debt is obtained from the opportunity costs which are triggered by the effect of debt on the firm's investment decisions, monitoring and bond expenses between the bondholder and the manager as well as the cost associated with bankruptcy and restructuring of the organization (Siddiqui & Afzal, 2012). Based on this, the optimal debt-to-equity ratio comes when it realizes that both debt and equity generate cost to the company and to minimize this cost, a trade-off is initiated between the two types of cost (Bendickson et al., 2016). According to Maher and Andersson (2000), conflicts arise among the manager and shareholders and debt holders. The conflict between managers and shareholders arises when the former refuses to invest or involve in a larger risk project if the expected return is very low (Maher & Andersson, 2000).

Also, conflicts between debt holders and shareholders arise when the manager intends to invest in risky projects that only favours the shareholders and not the bondholders. Canarella and Miller (2022) explained that managers do not use the appropriate matured bond to increase the shares of the bondholders, which creates a conflict between shareholders and bondholders. Therefore, in line with the study, the theory connotes that the FP of commercial banks can be stabilized if managers combine both debt and equity to finance their operations. Also, stakeholders can monitor the operations of the managers, board of directors and auditors to minimize conflicts.

2.2.1 Pecking order theory

Stewart Myers and Nicolas Majluf popularized this concept in 1984, and it has subsequently acquired widespread support (Butt et al., 2013).). The theory relates to the CS of companies and states that managers consider sources of financing when following a hierarchy. The hierarchy includes managers who consider a preferred source of fund opportunities for investment which includes first by the retained earnings of a company, next by debt and finally by choosing equity financing (Jibran et al., 2012).

The theory emerged from the concept of asymmetric information also known as information failure (Butt et al., 2013). This occurs when a transactional power imbalance exists as a result of one party possessing more information than the other. For example, a company's manager may have more and better information on areas such as the organization's performance, risk, opportunities, and outlook than outside users and may use it to their benefit. For the manager to compensate for information asymmetry, the user of the company's services demands a higher return to offset any risk taken. Thus, external sources of financing require a higher yield as a form of compensation for higher risk.

According to Jibran et al. (2012), a company develops its internal finances which help to minimize information asymmetry. This is opposed to finances from external sources such as equity financing and debt. With external finances like debt and equity, the firm incurs fees to get finances externally, however, internal financing is the least expensive as well as the most convenient source of financing.

Matemilola et al. (2011) indicated that the theory is criticized for its inability to involve new forms of funding. Thus, the theory has not been updated with newer financial methods for raising funds for a company. Moreover, there are no risk and rewards measures applied in the financing of costs. The perking theory applies to the current study topic as it explains how organisations can organise their financial structure through various financial sources to control all forms of biases and cheats in conducting transactions with clients.

2.3 Empirical review

The chapter's section on the influence of total debt to total assets ratio on gross profit margin, net profit margin, return on assets, and return on equity were examined. The majority of these connected papers came from online journals.

2.3.0 The effect of total Debt to Total Asset Ratio on Gross Profit Margin in the banking sector of Ghana

Aziz and Abbas (2019) looked into the impact of debt-to-total-assets ratios on gross profit margins in Pakistani enterprises. The study employed a quantitative research strategy to examine companies on the Stock Exchange in Pakistan from 14 distinct areas. From 2006 to 2014, relevant stock market data was collected via a secondary data source. A regression model, as well as descriptive statistics, were used to examine the data collected. The total debt-to-total assets ratio

was shown to be negatively connected with the banking sector's group profit margin, according to the findings of the study.

In Amman Bursa, Rahman (2017) examined the correlation between total debt to total assets ratio and gross profit margin. The research was conducted using a quantitative research method and involved a total of eight businesses. From 2012 to 2014, data from these companies' financial records were collected using a secondary data source. The descriptive statistics and Statistical Package for Social Science was used in this study's analysis. As rising debt costs and increased reliance on externally financed assets were excluded from the profit and loss or income statement after gross profit margin, the study's findings suggested that there was no significant association between total debt to total assets and gross profit margin.

Finally, in Europe, Horobet et al. (2021) investigated the impact of total debt on total assets on a firm's gross profit margin. The random forest methodology was used in the study, in which companies were picked at random and used to form a node and tree. 2011-2013, 2014-2016, and 2017-2019 were the three groups of companies picked. The data collected from the sampled nations were analysed using descriptive and inferential statistics. According to the study, total debt to total assets and gross profit margins have a negative relationship. This was because a high total debt-to-total-assets ratio increased asset utilisation efficiency while decreasing profitability.

2.3.1 The effect of total Debt to Total Asset Ratio on Net Profit Margin in the banking sector of Ghana

Muhammad et al. (2014) investigated the relationship between debt to total assets ratio and net profit margin among Pakistani enterprises. The study employed a quantitative research method, with twenty-five (25) publicly-traded companies on the Karachi Stock Exchange chosen. From

2009 to 2013, data from the Karachi Stock Exchange was gathered using a secondary data source. The results were reported using descriptive and inferential statistics, respectively, based on regression analysis. The debt-to-total-asset ratio was found to have a positive impact on the net profit margin in the study. This was due to the sector's debt financing.

In addition, Jayaraman, Azad, and Ahmed (2021) investigated how total debt affects net profit margins in Oman's commercial banks. Using a cross-sectional research approach, a total of sixteen (16) persons were chosen. Data was acquired from the financial accounts of the selected institutions from 2007 to 2019. The regression model, as well as descriptive and inferential statistics, were employed in the analysis. The analysis discovered a negative significant relationship between net profit margin and total debt to total assets. As a result, a rise in liquidity may result in a lower return on investment.

In Amman Bursa, Rahman (2017) investigated the correlation between total debt to total assets ratio and net profit margin. There was no significant association between total debt to total assets and net profit margins, according to the study's findings. The result also revealed that an increase in debt to assets or equity would result in higher financial costs and a lower net profit margin.

2.3.2 The effect of total Debt to Total Asset Ratio on Return on Assets in the banking sector of Ghana

Muhammad et al. (2014) investigated the relationship between total debt to total assets ratio and return on assets in Pakistani enterprises. The study's findings revealed that the debt to total asset ratio had a negative impact on return on assets. This was due to the sector's debt financing.

Aziz and Abbas (2019) also looked into the impact of total debt-to-total assets on return on assets among Pakistani enterprises. The study discovered a negative link between debt to total assets and return on assets. This means that the debt-to-total-assets ratio lowers a company's performance.

Kasasbeh (2021) looked at the impact of total debt on return on assets in Jordanian listed enterprises. A total of 40 listed organizations were included in the study, which used a qualitative research method. The information was taken from the audited financial statements that were published before 2007 and are still available. The analysis was carried out using GMM approaches as well as descriptive and inferential statistics. According to the data, there is a negative relationship between total debt and total assets, as well as return on assets. As a result, for every 1% increase in the total debt to total assets ratio, the return assets decline by 7.3 per cent.

The influence of the total debt-to-total assets ratio on the performance of Ghana's state-owned firms was investigated by Owusu-Ansah (2019). The study's findings revealed a negative relationship between total debt to total assets and return on assets. This meant that when the state-owned enterprise's equity increased, their return on assets would decrease. The quantitative research approach involved a total of twenty-two (22) State-Owned Enterprises. From 2014 to 2017, the secondary data source was used to obtain information from their website and stock market financial statements. Regression analysis, as well as descriptive and inferential statistics, were used to analyze the data.

Siddik et al. (2017) investigated the impact of total debt on return on assets among Indian commercial banks. From 2005 through 2014, panel data was used to engage a total of 22 banks. The pooled ordinary least square technique was used to evaluate the collected data. The study's

findings demonstrated a substantial negative association between total debt and total assets on return on assets. This meant that if the total debt to total assets ratio rose, the bank's performance would suffer.

2.3.3 The effect of total Debt to Total Asset Ratio on Return on Equity in the banking sector of Ghana

Furthermore, Muhammad et al. (2014) investigated the impact of total debt to total assets ratio on return on equity in Pakistani enterprises. A negative association was identified between debt-to-total assets and return on equity in the study. This was due to the sector's debt financing.

Reddy (2011) also looked at the impact of the debt-to-total-assets ratio on the return on equity of Indian enterprises. From 2008 to 2013, the study used a quantitative research approach to collect data from organisations using a secondary data source. To see how one or more variables influenced the effect of debt-to-total assets on return on equity, a correlation study was undertaken. According to the research, debt to total assets and return on equity have a strong relation.

Aziz and Abbas (2019) looked at the impact of total debt-to-total assets on return on equity in Pakistani enterprises. Debt to total assets exhibited a favourable link with return on assets, according to the study.

Kasasbeh (2021) also looked at the impact of the total debt-to-total-assets ratio on the equity of Jordan's publicly traded enterprises. According to the data, there was a negative and substantial association between the total debt to total assets ratio and return on equity.

Siddik et al. (2017) investigated the impact of total debt to total assets on return on equity in Indian commercial banks. The study's findings demonstrated a substantial negative association

between total debt and total assets on return on equity. The conclusion implied that the ratio of total debt to total assets had an inverse influence on commercial bank performance.

Musah (2018) investigated the effect of total debt to total assets on bank return on equity in Ghana. Over six years, 23 banks were sampled using a quantitative research method (2010 to 2015). Secondary data sources were used to collect data, which was then evaluated with a multiple regression model. Return on equity and total debt-to-total assets have a substantial negative association, according to the study. This means that the bank must reduce its reliance on both short- and long-term funding to enhance earnings.

2.4 Conceptual framework

A conceptual framework is a technique that is used to demonstrate or forecast the link between dependent and independent variables (Childs, 2010). Financial performance (return on equity, return on assets, net profit margin, and gross profit margin) are the dependent variables in this study, whereas CS is the independent variable (total debt to total asset). The link between these factors is illustrated in the model below:

Independent variable   Dependent variable

CAPITAL STRUCTURE
Total to Debt to Total Assets

→

PROFITABILITY
Return on assets
Return on equity
Gross Profit Margin
Net Profit Margin
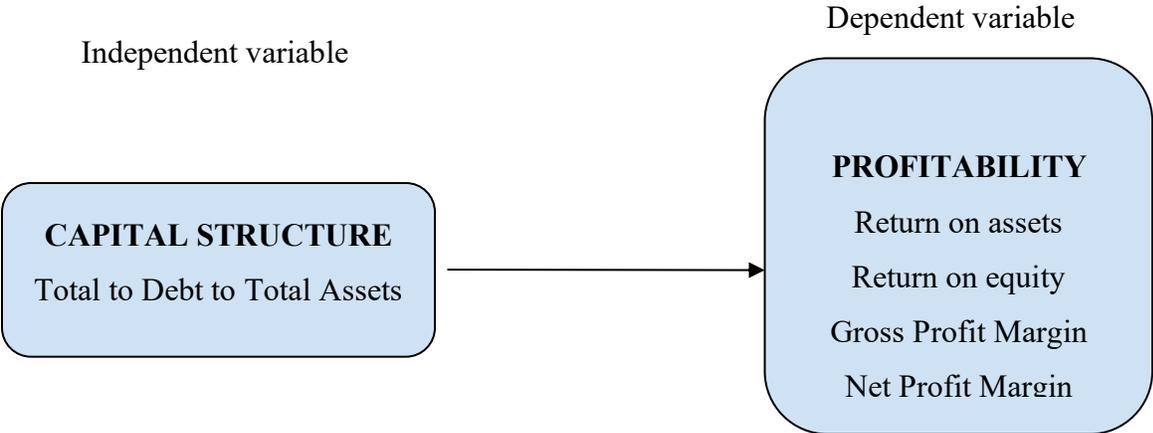
Source: Student's Construct, 2022

Figure 1: Conceptual framework on the relationship between capital structure and financial performance of commercial banks.

Capital structure is very pertinent in the FP of an organization nowadays. It is based on the reason why most companies create a strategic plan on how to finance their operations considering the competitive nature of the market. Most companies consider funding their operations with debts whereas others prefer to depend on equity or assets. However, both CSs imply the FP of an organization. According to Aziz and Abbas (2019), the use of debt to total assets implies the gross profit margin. The usage of debt to total assets affects the net profit margin, return on equity, and assets, according to Muhammad et al. (2014). A shift in the CS's value, as depicted in the diagram above, could affect commercial banks' FP.

2.5 Conclusion

The majority of the empirical literature came from various geographical locations. The following chapter will outline and explore the methodologies to apply to understand the actual reflection of the impact of CS on FP among commercial banks in Ghana, to bridge the research gap from limited literature in Ghana.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter outlines the research methods including the procedures or strategies that are used to find, select, process, and analyze data concerning the role of CS in enhancing FP. The procedures include the research design, population and sample selection, model specification, variable definitions and measurements, the estimation strategy, data description, and sources.

3.1 Research design

A research design is a methodology for logically and cogently integrating the various components of a study, making sure that the research problem is effectively addressed (Myers et al., 2010). The research design serves as a blueprint or template for data collection, measurement, and analysis. It is imperative to note that the research problem determines the type of research design to be chosen. As a result, given that the purpose of this research is to determine the current condition of a scenario, in this case, how CS affects commercial banks' FP. A suitable research design to adopt is a descriptive research design. The descriptive research design is appropriate for this study because it collects a large amount of data for detailed analysis, which is exactly what is needed (Siedlecki, 2020).

3.2 Population and sample selection

A research population is a large group of persons or objects with similar features and are the subject of a scientific study. Thus, the population for the study consist of banks that are publicly traded on the Ghana Stock Exchange. While it is for the benefit of the population that research works are done, it is worth mentioning that not every individual or item can be involved due to

the often-large size of the population and the fact that it can be time-consuming and expensive (Martínez-Mesa et al., 2016). This highlights the significance of sampling selection. The 10 commercial banks listed on the Ghana Stock Exchange form the study's sample set. Access Bank (Ghana) Plc, Agricultural Development Bank, Cal Bank Plc, Ecobank Ghana Limited, Fidelity Bank, GCB Bank, Republic Bank Plc, Societe Generale Ghana Limited, Standard Chartered Bank Limited Plc, and Trust Bank Limited are among these financial institutions.

A purposive sampling method was employed for the study. Kothari (2004) postulated that when the population is small and a well-known characteristic of the population requires extensive research, a purposive sampling method is optimal. The researcher used a purposive sample because the number of listed banks on the Ghana Stock Exchange is small and known. Furthermore, secondary data was used in the study. The study makes use of annual reports of banks' financial statements from 2009 to 2020 (12 years). The selected banks' data is sourced from the Ghana Stock Exchange, the central bank, and the banks' websites.

3.3 Model specification

On time-series cross-sectional data from 2009 to 2020, the impact of CS (CapStr) on FP in the banking sector is calculated. The study examines the impact of a few variables on FP in this section. Performance is as follows when gross profit margin (GPM), net profit margin (NPM), return on assets (ROA), and return on equity (ROE) are regressed on a variable:

$$Profitability = f(capital\ structure, Bank\ Size, Growth, Liquidity) \quad (1)$$

In the second, third, fourth and fifth equations, the static linear models are presented:

$$GPM_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots \quad (2)$$

$$NPM_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots \quad (3)$$

$$ROA_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots \quad (4)$$

$$ROE_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it}$$

$$+ \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots \quad (5)$$

Where;

α_i= y-intercept of the regression equation

$\beta_1, \beta_2, \beta_3, \beta_4$=are regression coefficients of the respective independent variables

GPM_{it}= Financial performance measured by gross profit margin, which revenue minus cost of goods is sold, divided by revenue

NPM_{it}= Financial performance measured by net profit margin, which is revenue minus cost divided by revenue

ROA_{it}= Return on assets is a metric that measures financial performance by dividing net income by total assets.

ROE_{it}=Return on equity (ROE) is a metric that measures financial performance by dividing net income by shareholder equity.

$BnkS_{it}$= Bank Size which is given as the natural logarithm of assets

Gth_{it}= Sales/revenue for the current year minus the prior year's sales/revenue divided by the previous year's sales/revenue gives the firm growth.

$Lqdt_{it}$= The current ratio, which is the current assets divided by the current liabilities, measures the bank's liquidity.

ε_{it}= Error term

3.4 Variable Definitions/Measurements

3.4.0 Dependent variable

Financial performance is the dependent variable, which refers to how well a company is doing (Heikal et al., 2014), and it is examined in this study using net profit margin (NPM), return on equity (ROE), gross profit margin (GPM), and return on assets (ROA).

i.   Gross Profit Margin

A company's gross profit margin is a profitability measure that shows the number of revenues in a given accounting period (Laudon & Traver, 2013). The gross profit margin is expressed by subtracting the company's revenues (net sales) from costs of goods sold, dividing by revenues, and multiplying by 100.

$$Gross\ Profit\ Margin = \frac{Revenues - Cost\ of\ Goods\ Sold}{Revenues} \times 100$$

ii.   Net Profit Margin

The amount of money left over after all expenses have been deducted is known as the net profit margin (Laudon & Traver, 2013). The gross profit margin is calculated by dividing the company's revenues (net sales) by revenues and multiplying by 100.

$$Net\ Profit\ Margin = \frac{Net\ Income}{Total\ Revenues} \times 100$$

iii. Return on Assets

The financial indicator return on assets (ROA) is a financial metric that compares the total assets of a company to determine its profitability (Heikal et al., 2014). To determine the return on investment, divide net income by total assets (ROA)

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

iv. Return on Equity

The ability of a firm to make returns on the investment it receives from its shareholders is referred to as return on equity (ROE) (Heikal et al., 2014). Net income divided by shareholder equity is the formula for calculating return on equity (ROE).

$$ROE = \frac{Net\ Income}{Shareholder's\ Equity}$$

3.4.1 Independent variable

The term "independent variable" means precisely what it says in the study. It is an independent variable, meaning it is unaffected by other factors. It, on the other hand, predicts or influences changes in other variables.

i. Capital structure (CS)

Capital structure, as previously stated, is the combination of loans and equity used to fund a company's assets and operations. On one hand, the total debt to asset ratio is used to evaluate a company's financial structure. The total debt to asset ratio is a calculation of how much of a company's total assets are financed by debt (Heikal et al., 2014). The following formula is used to compute the overall debt-to-asset ratio:

$$Total\ Debt\ to\ Asset\ Ratio = \frac{Total\ Debt}{Total\ Asset}$$

3.4.2 Control variables

Bank size, liquidity and growth are the control variables While these variables are held constant in the study, they could influence the outcome variable which in this case is, the FP of the banks.

i. Bank Size

Bank size is based on the total assets of the bank. This means that a bank with high total assets has a high value, which also means that the bank is efficient at generating revenues from its assets. On the other hand, a low total asset means low value and inefficient generation of revenues from assets.

ii. Growth

The difference between current and prior year yearly sales or revenues divided by the previous year's sales/revenue multiplied by 100 is used to calculate bank growth.

$$Bank\ Growth = \left(\frac{Revenue\ for\ year\ 2 - Revenue\ for\ year\ 1}{Revenue\ for\ year\ 1}\right) * 100$$

iii. Liquidity

The term "liquidity" relates to how rapidly an asset can be converted into cash without affecting its market value (Acharya & Mora, 2015). The current ratio, which is defined as current assets divided by current liabilities, is used to determine a bank's liquidity.

$$Liquidity = \frac{current\ Asset}{current\ liability}$$

3.5 Estimation strategy

i. Normality

Normal data is the underlying assumption in parametric testing. Many statistical tests require determining the normality of data because if data are not normally distributed, the resulting mean does not reflect the value of the data (Vaclavik et al., 2018). Even though normality testing can be done in a variety of ways, for this study, the SPSS statistics test is used. It is critical to conclude that the data do not follow a normal distribution if the p-value is equal or less compared to the significance level. The null hypothesis must be rejected in such a case.

ii. Stationarity

Stationarity, in common terms, refers to the fact that the statistical parameters of a process that generates a time series remain unchanged over time (Hadri & Kurozumi, 2012). The Augmented Dickey-Fuller (ADF) test is used in this research to access the stationarity of time series. Here, the more negative the ADF test, the stronger the rejection of the hypothesis.

iii. Multicollinearity

When two or more independent variables have a strong correlation with one another, this is known as multicollinearity (Perez-Melo & Kibria, 2020). The variance inflation factor is used in the study to check for multicollinearity (VIF). The variance inflation factor impacts the strength of the relationship between independent variables as well as the relationship itself. In using the variance inflation factor, a value of 1 represents no relationship between the independent variable and any others. Furthermore, if the variance inflation factor is between 1 and 5, then there is a moderate correlation. However, if the variance inflation factor is more than 5, then this shows a critical level of multicollinearity, which means that the coefficients are not properly estimated.

iv. Heteroscedasticity

Heteroscedasticity means uneven scatter. However, in the context of regression analysis, it is described as the error term or residuals (Khaled et al., 2019). Here, the residuals must be randomly

displayed or have no patterns. On the one hand, if the residuals have patterns, then this means that the model has a problem, which also means that the data (results) cannot be trusted.

v. Hausman tests

The Hausman test can help one decide whether to employ a random effect or a fixed-effect model (Amini et al., 2012). The random-effect model is unexpected and unpredictable, whereas the fixed-effect model is consistent and does not alter over time. The null hypothesis is that the random effect model is the most appropriate when doing the Hausman specification test, whereas the alternative hypothesis is that the fixed effect model is the most appropriate. When the p-value results are less than the 0.05 significance level, the null hypothesis is rejected in favour of the alternative hypothesis. According to the alternative hypothesis, the fixed-effect model is the most appropriate.

3.6 Data Description and Sources

From 2009 to 2020, data was obtained from audited financial statements of ten commercial banks listed on Ghana's stock exchange (12 years). For authentication, the data was gathered from financial statements that are publicly available on the Ghana Stock Exchange's website as well as the banks' websites.

4.1 Introduction

This chapter presents the findings of the study's data collection. The results were gathered from the financial statements of banks listed on the Ghana Stock Exchange. The findings were examined in light of the study's several research subjects.

4.2 Descriptive statistics

The panel data received from commercial banks listed on the Ghana Stock Exchange is shown in Table 4.1 below.

Table 4.1: Summary of the panel data obtained from commercial banks on the Ghana Stock Exchange

Variable	Obs	Mean	Std. Dev.	Min	Max
GPM	120	0.6755824	0.1462739	0.2950931	0.9608834
NPM	120	0.3031758	0.2383112	0.0123417	1.803535
ROA	120	0.0413875	0.0533978	0.0016423	0.5169937
ROE	120	0.2942797	0.374792	0.005805	3.351605
CapStr	120	0.9557736	0.9452207	0.1581892	10.53849
BnkS	120	2.23E+08	8.02E+08	93110	5.12E+09
Gth	110	0.2675445	0.4410485	-0.8224459	3.12664
Lqdt	120	0.3144283	0.4135831	0.0910456	3.924907

Source: Financial Statements of banks on the GSE

As shown in Table 4.1, the variable observation (return on equity [ROE], gross profit margin [GPM], Bank Size [BnkS], net profit margin [NPM], Liquidity [Lqdt], return on assets [ROA],, and capital structure [CapStr].) amounted to 120, whereas growth [Gth] had 110 observations. Thus, 10 listed banks by a period of 12 years (2009 to 2020) and 10 listed banks by growth period

of 9 years (2009 to 2020). An average mean value for gross profit margin was 0.6755824, and 0.1462739 as standard deviation. The minimum value for gross profit margin ranged from 0.2950931 to a maximum value of 0.9608834. Similarly, the net profit margin recorded 0.3031758 as its average mean value, and 0.2383112 as standard deviation. The minimum value for net profit margin ranged from 0.0123417 to a maximum value of 1.803535. In addition, the average mean value of return on assets was 0.0413875, and 0.0533978 as standard deviation. The minimum value for return on assets ranged from 0.0016423 to a maximum value of 0.5169937. Furthermore, the average mean value of return on equity was 0.2942797, and 0.374792 as standard deviation. The minimum value for return on equity ranged from .005805 to a maximum value of 3.351605. The average mean value for the CS was 0.9557736, and the standard deviation value of 0.94522207. The minimum value for CS ranged from 0.1581892 to a maximum value of 10.53849. The bank size recorded an average mean value of 223,000,000 and a standard deviation value of 802,000,000. The minimum value for bank size ranged from 93110 to a maximum value of 5,120,000,000. Again, the average mean of the growth was 0.2675445, and a standard deviation of 0.4410485. The growth's minimum value ranged from -0.8224459 to a maximum value of 3.12664. Finally, the liquidity had an average mean score of .3144283, and a standard deviation value of 0.4135831. Liquidity's minimum value ranged from 0.0910456 to a maximum value of 3.924907.

Table 4.2: Panel Unit root test results

Variables	At Level		First difference	
	Value	P-Value	Value	P-Value
GPM	-1.5548	0.0600	-5.0757***	0.0000
NPM	-3.0675**	0.0011	-9.0177***	0.0000
ROA	-21.7115***	0.0000	-9.5358***	0.0000
ROE	-2.3079*	0.0105	-7.4685***	0.0000
CAPSTR	-6.2e+02***	0.0000	-2.4e+02***	0.0000
Total Asset (Size)	-4.8344***	0.0000	-12.8372***	0.0000
Growth	-3.6196***	0.0001	-10.8813***	0.0000
Liquidity	2.6430	0.9959	-5.4846***	0.0000

Note: ***represents significance at 0.01
LLC=Levin-Lin-Chu Test

The Levin-Lin-chu unit root test results are shown in Table 4.2. Each panel has a unit root, according to the null hypothesis, however, the alternative hypothesis claims that the panels are static. All of the variables are stationary after the initial difference, as seen in the table above.

4.3 Correlation

Table 4.3: Correlation of the variables

	GPM	NPM	ROA	ROE	CapStr	BnkSlog	Gth	Lqdt
GPM	1							
NPM	0.103	1.000						
ROA	-0.046	0.241*	1.000					
ROE	0.099	0.949*	0.215*	1.000				
CapStr	-0.114	-0.078	0.918*	-0.060	1.000			
BnkSlog	0.125	0.451*	-0.592*	0.468	-0.745*	1.000		
Gth_di	0.258*	0.054	0.123	-0.011	0.077	0.089	1.000	

Lqdt	-0.244	0.031	-0.038	0.064	-0.025	0.096	-0.287*	1.000

As shown in Table 4.3, the correlation analysis was conducted for the selected variables (GPM, NPM, ROA, ROE, CS, liquidity, growth and bank size). The correlation coefficient (r=0.103) reveals a positive relationship between NPM and GPM. The coefficient (r=-0.460) shows a negative relationship between ROA on GPM. Again, the correlation coefficient (r=0.241) signifies a significant relationship between ROA and NPM. Again, the coefficient value (r=0.099) shows a positive relationship between ROE and GPM. Furthermore, the coefficient value (r=0.949) reveals a significant relationship between ROE and NPM. Similarly, the correlation coefficient (r=0.215) implies a significant relationship between ROE and ROA.

The correlation coefficient (r=-0.114) suggests a negative correlation between GPM in terms of CS. Again, the correlation coefficient result (r=-0.078) indicates that CS and NPM have a negative relation. Similarly, the correlation value (r=0.718) indicates that CS and ROA have a significant association. Furthermore, the correlation value (r=-0.060) shows that CS and ROE have a negative connection.

In terms of bank size, the correlation coefficient (r=0.125) indicates that bank size and GPM have a positive association. Again, the coefficient (r=0.451) indicates that bank size and NPM have a significant association. Furthermore, the correlation (r=-0.592) indicates that there is a significant negative link between bank size and ROA. Furthermore, the coefficient (r=0.468) indicates that bank size and ROE have a substantial association. As the correlation coefficient value (r=-0.745) shows, there is a negative significant association between bank size and CS.

In terms of growth, the correlation value (r=0.258) indicates that growth and GPM has a significant positive correlation. Similarly, the correlation value (r=-0.054) indicates that growth

and NPM have a negative relation. Furthermore, the coefficient (r=0.123) indicates that growth and ROA have a positive relationship. . Again, the coefficient (r=-0.011) indicates a negative link between growth and ROE. Furthermore, the correlation value (r= 0.077) indicates a positive relationship between growth and CS. The correlation coefficient result (r=0.089) indicates that there is a positive association between growth and bank size.

Finally, the correlation coefficient (r= 0.245) suggests a significant, although negative, the relationship between liquidity and GPM. Furthermore, the correlation value (r=0.031) indicates a positive association between liquidity and NPM. Furthermore, the coefficient (r=-0.038) indicates that liquidity and ROA have a negative relationship. As the coefficient (r=0.064) shows, liquidity and ROE has a positive relationship.   The correlation coefficient value (r=-0.025) indicates that liquidity and CS have a negative relationship. The correlation value (r=0.096) indicates that liquidity and bank size have a positive association. Finally, the coefficient value (r=-0.287) indicates that liquidity and growth have a negative significant correlation.

4.4   Regression Analysis

4.4.1 Choosing Between the Random and Fixed Effect Model

The Random Effect Model assumes that each variable's obtained observation changes with time; whereas the Fixed Effect Model assumes that it does not. Accordingly, the Hausman specification test aids in determining which model is best for interpreting the regression model or findings.

4.4.2 Hausman Test

The Hausman specification test posits the hypothesis as stated follows;

H_0: Random effect model is appropriate

H_1: Fixed effect model is appropriate

Model 1:

$$GPM_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it} + \varepsilon_{it}$$

Test results;

Table 4.4: Hausman test results for Model1

	Coefficients			
	(b) **Fixed**	**(B)** **Random**	**(b-B)** **Difference**	**Sqrt(diag(V_bV_B))** **S.E.**
CapStr	-0.003453	-0.0020827	0.0018374	0.004425
BnkSlog	0.0266254	0.0200853	0.0065401	0.0116462
Gth	0.0184134	0.0193958	-0.0009824	0.0028266
Lqdt	-0.0247125	-0.025833	0.005708	0.0043473

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2 (4) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

$\qquad\qquad = \qquad$ 0.35

$\quad$ Prob>chi2 = $\quad$ 0.9864

The Hausman test, which generated a p-value of 0.9864, and greater than 0.05, did not reject the

null hypothesis. Therefore, the random effect model was considered the best option to assess the

impact of capital structure (CAPSTR) on gross profit margin (GPM).

Model 2:

$$NPM_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it} + \varepsilon_{it}$$

Test results;

Table 4.5: Hausman test results for Model2

| | Coefficients | | | |
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_bV_B)) S.E.
CapStr	0.2492945	0.2133275	0.035967	0.0153947
BnkSlog	0.9978093	0.89695253	0.1005918	0.0394434
Gth	-0.1280938	-0.1142628	-0.013831	0.0073768
Lqdt	-0.0623086	-0.0721699	0.0098614	0.0135312

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

 Test: Ho: difference in coefficients not systematic

   chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

        =   6.64

   Prob>chi2 =   0.1559

To interpret the effect of CS on the net profit margin, the findings considered the random-effect model as the best option. This was proven by the Hausman test which generated a p-value of 0.1559, which is greater than 0.05. Hence the null hypothesis was not rejected.

Model   3:

$$ROA_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it} + \varepsilon_{it}$$
Test results;

Table 4.6: Hausman test results for Model 3

| | Coefficients | | | |
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt(diag(V_bV_B)) S.E.

CapStr	0.0603314	0.0587153	0.001616	0.0018623
BnkSlog	0.0435746	0.0398082	0.0037664	0.0049496
Gth	0.0001486	0.0007263	-0.0005777	0.001284
Lqdt	-0.003287	-0.0035923	0.0003053	0.0018972

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

$\qquad$ = 0.78

Prob>chi2 = 0.9414

To interpret the effect of capital structure [CAPSTR] on the Return on Asset [ROA], the findings considered the random-effect model as the best option. This was proven by the Hausman test which generated a p-value of 0.9414, which is greater than 0.05. Hence the null hypothesis was not rejected.

Model 4:

$$ROE_{it} = \alpha_i + \beta_1 CapStr_{it} + \beta_2 BnkS_{it} + \beta_3 Gth_{it} + \beta_4 Lqdt_{it} + \varepsilon_{it}$$

Test results;

Table 4.7: Hausman test results for Model 4

Coefficients			
(b)	**(B)**	**(b-B)**	**Sqrt(diag(V_bV_B))**

	Fixed	Random	Difference	S.E.
CapStr	0.4568463	0.3985242	0.0583222	0.0224144
BnkSlog	1.802801	1.631253	0.1715485	0.056372
Gth	-0.1822251	-0.1592028	-0.0230224	0.0074931
Lqdt	-0.0652088	-0.0817579	0.0165491	0.0180061

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2 (4) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

$\qquad$ = $\qquad$ 9.31

Prob>chi2 = 0.0538

To interpret the effect of capital structure [CAPSTR] on the Return on Equity [ROE], the findings considered the random-effect model as the best option. This was proven by the Hausman test which generated a p-value of 0.0538, which is greater than 0.05. Hence the null hypothesis was not rejected.

Table 4.8: Random Effects GLS Regression

	Random Effect model			
	model 1	model 2	model 3	model 4
Variables	Gross Profit Margin	Net Profit Margin	Return on Assets	Return on Equity
Capital structure	-.0021 (-0.22)	.2133*** (5.72)	.0587*** (15.44)	.3985*** (6.88)
bank size	.0201 (0.72)	.8970*** (8.21)	.0398*** (3.57)	1.631*** (9.61)

Growth	.0194	-.1143**	.0007	-.1592**
	(1.84)	(0.006)	(0.17)	(-2.49)
Liquidity	-.0253	-.0722	-.0036	-.0818
	(-1.96)	(-1.43)	(-0.70)	(-1.04)
Constant	.0004	.0326***	-.0095**	-.3658***
	(0.05)	(-6.03)	(-2.85)	(-7.22)
N	100	100	100	100
R-sq	0.1177	0.4214	0.8198	0.4978
F(Prob)	12.68	69.19	432.30	94.16
	(0.0130)	(0.0000)	(0.0000)	(0.0000)

Notes: t statistics in parentheses

 * $p<0.05$, ** $p<0.01$, *** $p<0.001$

The probability value is significant (p0.05) for regression models 1, 2, 3, and 4, indicating that the models are well-fit. The independent factors (capital structure) and the control variables explain 11.8 per cent, 42.1 per cent, 82.0 per cent, and 49.8 per cent of the variance in the dependent variables (GPM, NPM, ROA, and ROE), respectively, with r-squared of 0.1177, 0.4214, 0.8198, 0.4978 for model 1, 2,3, and 4 (Bank size, growth and liquidity).

As shown in Table 4.8, the Random Effect Model was used to interpret the role of CS in enhancing FP.

Model 1 found that CS had no statistically significant positive influence on gross profit margin (=-0.0021, t=-0.22, p>0.05). As a result, the null hypothesis has been accepted. The findings also show that CS has a statistically significant positive influence on net profit margin (=0.2133, t=5.72, p0.001). As a result, the null hypothesis was disproved. The study's findings show that CS has a statistically significant positive effect on return on assets (=0.0587, t=15.44, p0.001). As a result, the null hypothesis was disproved. Finally, the model demonstrates that there is a

statistically significant positive influence of CS on return on equity (β=0.3985, t=6.88, p<0.001). As a result, the null hypothesis was disproved.

For the control variables, the model results show that firm size has no statistically significant impact on gross profit margin (=0.0201, t=0.72, p>0.05). As a result, the null hypothesis has been accepted. Firm size has a statistically significant positive effect on net profit margin (=0.8970, t=8.21, p0.001), according to the model's findings. Furthermore, the model depicts that the size of a company has a statistically significant positive impact on return on assets (=0.0398, t=3.57, p0.001). Furthermore, the results of the model show that firm size has a statistically significant positive effect on return on equity (=1.631, t=9.61, p0.001). Growth has a statistically significant negative influence on net profit margin (=-0.1143, t=0.006, p0.01), according to the model. Furthermore, the model shows that growth has a statistically significant negative influence on return on equity (=-0.1592, t=-2.49, p0.001).

4.5 Discussions

4.5.1 The Effect of Capital Structure (CS) on Net Profit Margin in the banking sector of Ghana.

Capital structure has a statistically significant positive impact on net profit margin (=0.2133, t=5.72, p0.001), according to the study results. This means that a 0.2133 increment in net profit margin can be achieved by adding a unit to the CS. According to Singh and Bagga (2019), CS refers to a company's use of a mix of debt and equity to fund its activities. Considering the fierce competition, most companies prefer to use equity to finance their operations since equity is cheap and flexible as compared to loans. On the other hand, the net profit margin measures the remaining money left after all deductions have been made (Jayathilaka, 2020). According to Jayathilaka (2020), when debt to cost is less than equity, both CSs affect a company's profit margins. Each

year, a company with a high debt CS pays a large interest payment, which reduces the net profit margin (Wieczorek-Kosmala, et al., 2021). Despite the large interest payment, the company is entitled to keep all profits earned during that period. The findings of this research corroborated with pecking order theory, which states that if a company organises its financial structure through various financial sources, it can control the effect of CS on net profit margin. Also, a study conducted by Rahama (2017) supported this result stating that an increase in the debt to assets increases financial cost which affects the net profit margin.

4.5.2 The Effect of Capital Structure on Return on Assets in the banking sector of Ghana.

The findings show that CS has a statistically significant positive effect on return on assets (=0.0587, t=15.44, p0.001). This suggests that a 0.0587 rise in return on assets will occur from a unit increase in CS. According to Wieczorek-Kosmala, et al., (2021), when a corporation uses debt to finance its activities or operations, the company's assets expand as a result of the influx of cash. In other words, when the debt is spent to increase production, significantly the return on assets will increase. To put it another way, when debt is utilised to expand production, the return on assets increases. When debt is expensive, however, it has a negative impact on net income, lowering the return on assets due to excessive spending (Wieczorek-Kosmala, et al., 2021). The findings of this study are backed with the pecking order theory, which states that asymmetric knowledge can assist managers to maintain a hierarchy of financial structure by giving them complete control over their spending and capitalising on their assets to generate appropriate income. However, in contrast to the study's findings, Muhammed et al. (2014) hypothesized a negative association between debt to total asset ratio and ROA. Also, Aziz and Abbas (2019) discovered a negative association between debt and total assets on ROA in their investigation.

4.5.3 The Effect of Capital Structure on Return on Equity in the banking sector of Ghana.

CS has a statistically significant positive impact on return on equity (=0.3985, t=6.88, p0.001), according to the findings of the study. This means that the return on equity grows by 0.3985 for every unit added to the CS. Return on equity (ROE) is defined as a company's annual profit divided among its shareholders (Suhendry, 2021). . As a result, a company's CS, which includes debt and equity, has an impact on its return on equity. According to Suhendry (2021), when a company uses excessive debt to support its operations, the company's leverage increases. This implies that if a corporation takes on more debt and leverage, its return on equity rises faster than its return on assets. But during recessions, corporations incur exponential losses due to leverage (Sadiq, & Sher, 2016). This finding is consistent with the agency hypothesis, which states that if a corporation uses more debt than equity, it may be eligible for tax benefits because interest payments are deductible. However, the higher the cost, the more leverage a company obtains. In contrast to the study result, a study conducted by Kasasbeh (2021) revealed that the relationship between total debt to total assets on equity and ROE was negative and significant. A study by Muhammad et al (2014) found a negative association between debt-to-total assets and return on investment. In addition, Siddik (2017) discovered that total debt to total assets had a negative significant impact on ROE.

4.5.4 The Effect of Capital Structure on Gross Profit Margin in the banking sector of Ghana.

Capital structure has no statistically significant negative influence on gross profit margin (r=-0.0021, t=-0.22, p>0.05), according to the study's findings. This result is consistent with Aziz and Abbas's (2019) findings, which found that the total debt-to-total assets ratio was inversely connected with the gross profit margin. . Rahman (2017) found no correlation between total debt to total assets and GPM in a study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study's principal findings are summarised in this chapter. The chapter ends with recommendations for both practice and future research based on the study's findings. A significant role is played by the CS decision.

5.2 Summary

With evidence from Ghana's banking system, the study's objective was to investigate the effect of CS in optimising FP. Four particular objectives were defined as part of the study to aid in the achievement of the main goal. Examining the impact of total debt on GPM, total debt to total asset ratio on NPM, total debt to total asset ratio on ROA, and total debt to total asset ratio on ROE in Ghana's banking system was among the particular objectives. The study used a descriptive research approach to achieve these objectives. The population in this study were banks that were listed on the Ghana Stock Exchange. As a result, the study included a sample of ten (10) commercial banks. ADB, Trust Bank Limited, Access Bank, Cal Bank, Republic Bank, Standard Chartered Bank, Ecobank, Fidelity Bank, GCB Bank, and Societe Generale Ghana Limited were among the banks that were chosen. Only secondary data was used in the study, which included yearly reports of bank financial statements from 2009 through 2020. As a result, the data was acquired from the banks', the Ghana Stock Exchange's, and the central bank's websites. The data was analysed using panel regression, and the results were interpreted using the random effect model's findings.

5.3 Key findings

The effect of capital structure on Net Profit Margin of banks

"There is no statistically significant effect of Total Debt to Total Asset Ratio on Net Profit Margin in the banking industry of Ghana," says the null hypothesis for objective 2. As indicated in Table 4.4, the results of model 2 of this study revealed that CS has a positive statistically significant effect on bank net profit margins (r=0.2133, t=5.72, p0.05). As a result, the null hypothesis was ruled out.

The impact of capital structure on ROA of banks

"There is no statistically significant effect of Total Debt to Total Asset Ratio on ROA in the banking industry of Ghana," says the null hypothesis for objective 3. However, the study discovered a positive statistically significant influence of CS on a bank's Return on Asset (r= 0.0587, t=15.44, p0.05) based on the results provided in Table 4.4 (model 3). As a result, the null hypothesis was ruled out.

The effect of capital structure on ROE of banks

"There is no statistically significant influence of Total Debt to Total Asset Ratio on ROE in the banking industry of Ghana," says the null hypothesis for objective 4. The study discovered a positive statistically significant influence of CS on bank ROE (= 0.3985, t=6.88, p0.05) based on the results provided in Table 4.4 (model 4). As a result, the null hypothesis is ruled out.

The effect of capital structure on Gross Profit Margin of banks

"There is no statistically significant effect of Total Debt to Total Asset Ratio on GPM in the banking sector of Ghana," declares the null hypothesis for objective 1. The study discovered that CS has no statistically significant effect on gross profit margin, as indicated in Table 4.4 (model 1). (t=-0.22, p>0.05) (=-0.0021, t=-0.22). As a result, the null hypothesis was accepted.

5.4 Conclusion

With evidence from Ghana's banking system, the study intended to assess the effect of CS in increasing FP. Because of the findings, the following conclusions are drawn.

The study concludes that CS has a statistically significant positive effect on bank net profit margins. This translates to a 0.2133 rise in net profit margin for every unit increase in capital. The study goes on to say that, CS has a statistically significant positive effect on bank ROA, with a unit increase in CS resulting in a 0.0587 increase in return on assets.

Finally, the study found that CS has a statistically significant positive effect on bank ROE, with a unit increase in CS resulting in a 0.3985 rise in return on equity.

5.5 Recommendations

Based on the findings of the study, the following recommendations are made:

The study discovered that CS had a statistically significant positive effect on bank ROA. This suggests that a higher CS will lead to a higher bank asset return, and vice versa. According to the study, financial institutions should encourage the use of short-term debts more than long-term debts to increase return on assets because long-term debts raise costs.

i. CS has a statistically significant beneficial effect on ROE, according to the study's findings. This means that if a bank's CS improves, so does its return on equity (ROE), and vice versa. Because the CS is the mix of debt and equity used to fund an organization's assets and operations. It is recommended that bank executives decide whether to fund their activities using internal cash rather than borrowing. This is because borrowing reduces bank profits, which has an impact on FP.

5.6 Recommendation for future studies

ii. According to the findings, further research should look at the impact of CS on non-financial enterprises' FP. This can be done by conducting a comparative study on both financial institutions

and non-financial institutions to examine how the variables examined affect both sectors and if the trends are similar or different.

iii.   Consequently, a comparative study can be considered in future studies between two countries like Ghana and Nigeria to examine how these variables are affecting financial institutions in both countries. This is to examine if the trends are similar or not.

iv.   The study also recommends that future studies should consider other factors like financial leverages and how they can affect the FP of firms. By including financial leverages, future studies can examine how financial institutions are using debts to acquire additional assets and if these debts are positively or negatively influencing the FP of the companies.

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APPENDIX A

```
. summarize GPM NPM ROA ROE CapStr BnkS Gth Lqdt
```

Variable	Obs	Mean	Std. Dev.	Min	Max
GPM	120	.6755824	.1462739	.2950931	.9608834
NPM	120	.3031758	.2383112	.0123417	1.803535
ROA	120	.0413875	.0533978	.0016423	.5169937
ROE	120	.2942797	.374792	.005805	3.351605
CapStr	120	.9557736	.9452207	.1581892	10.53849
BnkS	120	2.23e+08	8.02e+08	93110	5.12e+09
Gth	110	.2675445	.4410485	−.8224459	3.12664
Lqdt	120	.3144283	.4135831	.0910456	3.924907

	GPM_d1	NPM_d1	ROA_d1	ROE_d1	CapStr~1	BnkSlo~1	Gth_d1
GPM_d1	1.0000						
NPM_d1	0.1029	1.0000					
	0.2847						
ROA_d1	−0.0459	0.2413*	1.0000				
	0.6341	0.0111					
ROE_d1	0.0987	0.9487*	0.2149*	1.0000			
	0.3050	0.0000	0.0241				
CapStr_d1	−0.1137	−0.0780	0.9184*	−0.0600	1.0000		
	0.2369	0.4179	0.0000	0.5332			
BnkSlog_d1	0.1246	0.4512*	−0.5923*	0.4681*	−0.7445*	1.0000	
	0.1946	0.0000	0.0000	0.0000	0.0000		
Gth_d1	0.2583*	−0.0542	0.1230	−0.0114	0.0768	0.0887	1.0000
	0.0095	0.5922	0.2229	0.9106	0.4475	0.3802	
Lqdt_d1_d1	−0.2445*	0.0305	−0.0377	0.0642	−0.0252	0.0956	−0.2869*
	0.0142	0.7633	0.7093	0.5259	0.8033	0.3440	0.0038

	Lqd~1_d1
Lqdt_d1_d1	1.0000

```
Fixed-effects (within) regression              Number of obs     =        100
Group variable: code                           Number of groups  =         10

R-sq:                                           Obs per group:
     within  = 0.1170                                        min =         10
     between = 0.1261                                        avg =       10.0
     overall = 0.1171                                        max =         10

                                                F(4,86)           =       2.85
corr(u_i, Xb)  = 0.0144                         Prob > F          =     0.0287
```

GPM_d1	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
CapStr_d1	-.0002453	.010503	-0.02	0.981	-.0211247	.020634
BnkSlog_d1	.0266254	.0302334	0.88	0.381	-.0334767	.0867275
Gth_d1	.0184134	.0108998	1.69	0.095	-.0032546	.0400814
Lqdt_d1_d1	-.0247125	.0136429	-1.81	0.074	-.0518338	.0024088
_cons	-.0010406	.0088006	-0.12	0.906	-.0185356	.0164544

sigma_u	.01281503	
sigma_e	.05865644	
rho	.04555724	(fraction of variance due to u_i)

```
F test that all u_i=0: F(9, 86) = 0.47                    Prob > F = 0.8908
```

```
Random-effects GLS regression                  Number of obs     =        100
Group variable: code                           Number of groups  =         10

R-sq:                                           Obs per group:
     within  = 0.1164                                        min =         10
     between = 0.1526                                        avg =       10.0
     overall = 0.1177                                        max =         10

                                                Wald chi2(4)      =      12.68
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0130
```

GPM_d1	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
CapStr_d1	-.0020827	.0095254	-0.22	0.827	-.0207522	.0165867
BnkSlog_d1	.0200853	.0279003	0.72	0.472	-.0345982	.0747689
Gth_d1	.0193958	.0105269	1.84	0.065	-.0012365	.0400281
Lqdt_d1_d1	-.0252833	.0129318	-1.96	0.051	-.0506292	.0000625
_cons	.0004282	.0083227	0.05	0.959	-.0158841	.0167404

sigma_u	0	
sigma_e	.05865644	
rho	0	(fraction of variance due to u_i)

```
. hausman fixed .
```

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
CapStr_d1	-.0002453	-.0020827	.0018374	.004425
BnkSlog_d1	.0266254	.0200853	.0065401	.0116462
Gth_d1	.0184134	.0193958	-.0009824	.0028266
Lqdt_d1_d1	-.0247125	-.0252833	.0005708	.0043473

```
                    b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

            chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =            0.35
          Prob>chi2 =          0.9864
```

```
Fixed-effects (within) regression          Number of obs      =         100
Group variable: code                        Number of groups   =          10

R-sq:                                       Obs per group:
    within  = 0.4671                                      min =          10
    between = 0.0023                                      avg =        10.0
    overall = 0.4194                                      max =          10

                                            F(4,86)            =       18.84
corr(u_i, Xb)  = -0.3068                    Prob > F           =      0.0000
```

NPM_d1	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
CapStr_d1	.2492945	.0403507	6.18	0.000	.16908	.3295089
BnkSlog_d1	.9975441	.1161513	8.59	0.000	.766643	1.228445
Gth_d1	-.1280938	.0418748	-3.06	0.003	-.2113382	-.0448494
Lqdt_d1_d1	-.0623086	.0524137	-1.19	0.238	-.1665035	.0418864
_cons	-.2184573	.0338102	-6.46	0.000	-.2856699	-.1512448
sigma_u	.07085568					
sigma_e	.22534722					
rho	.08997056	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(9, 86) = 0.86                 Prob > F = 0.5643
```

```
Random-effects GLS regression                      Number of obs      =          100
Group variable: code                               Number of groups   =           10

R-sq:                                              Obs per group:
    within  = 0.4649                                            min =           10
    between = 0.0062                                            avg =         10.0
    overall = 0.4214                                            max =           10

                                                   Wald chi2(4)       =        69.19
corr(u_i, X)    = 0 (assumed)                      Prob > chi2        =       0.0000
```

NPM_d1	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
CapStr_d1	.2133275	.0372985	5.72	0.000	.1402237	.2864312
BnkSlog_d1	.8969523	.109249	8.21	0.000	.6828283	1.111076
Gth_d1	-.1142628	.04122	-2.77	0.006	-.1950525	-.0334732
Lqdt_d1_d1	-.0721699	.0506369	-1.43	0.154	-.1714165	.0270767
_cons	-.1965791	.0325893	-6.03	0.000	-.2604529	-.1327053
sigma_u	0					
sigma_e	.22534722					
rho	0	(fraction of variance due to u_i)				

. hausman fixed .

	———— Coefficients ————			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
CapStr_d1	.2492945	.2133275	.035967	.0153947
BnkSlog_d1	.9975441	.8969523	.1005918	.0394434
Gth_d1	-.1280938	-.1142628	-.013831	.0073768
Lqdt_d1_d1	-.0623086	-.0721699	.0098614	.0135312

```
                    b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

            chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =         6.64
            Prob>chi2 =       0.1559
```

```
Fixed-effects (within) regression                    Number of obs    =         100
Group variable: code                                 Number of groups =          10

R-sq:                                                Obs per group:
    within  = 0.8121                                               min =          10
    between = 0.9456                                               avg =        10.0
    overall = 0.8196                                               max =          10

                                                     F(4,86)          =       92.90
corr(u_i, Xb)  = -0.1806                             Prob > F         =      0.0000
```

ROA_d1	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
CapStr_d1	.0603314	.0042335	14.25	0.000	.0519155	.0687473
BnkSlog_d1	.0435746	.0121863	3.58	0.001	.0193491	.0678001
Gth_d1	.0001486	.0043934	0.03	0.973	-.0085851	.0088824
Lqdt_d1_d1	-.003287	.0054991	-0.60	0.552	-.0142189	.0076448
_cons	-.0102494	.0035473	-2.89	0.005	-.0173011	-.0031976
sigma_u	.00406713					
sigma_e	.02364279					
rho	.0287418	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(9, 86) = 0.28                        Prob > F = 0.9798
```

```
Random-effects GLS regression                        Number of obs    =         100
Group variable: code                                 Number of groups =          10

R-sq:                                                Obs per group:
    within  = 0.8119                                               min =          10
    between = 0.9488                                               avg =        10.0
    overall = 0.8198                                               max =          10

                                                     Wald chi2(4)     =      432.30
corr(u_i, X)   = 0 (assumed)                         Prob > chi2      =      0.0000
```

ROA_d1	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
CapStr_d1	.0587153	.0038019	15.44	0.000	.0512638	.0661669
BnkSlog_d1	.0398082	.0111358	3.57	0.000	.0179823	.061634
Gth_d1	.0007263	.0042016	0.17	0.863	-.0075086	.0089613
Lqdt_d1_d1	-.0035923	.0051615	-0.70	0.486	-.0137086	.006524
_cons	-.0094576	.0033219	-2.85	0.004	-.0159683	-.0029469
sigma_u	0					
sigma_e	.02364279					
rho	0	(fraction of variance due to u_i)				

```
. hausman fixed .

                        ────── Coefficients ──────
                         (b)            (B)            (b−B)        sqrt(diag(V_b−V_B))
                        fixed          random        Difference            S.E.

    CapStr_d1          .0603314       .0587153         .001616            .0018623
    BnkSlog_d1         .0435746       .0398082        .0037664            .0049496
       Gth_d1          .0001486       .0007263       −.0005777             .001284
    Lqdt_d1_d1         −.003287      −.0035923        .0003053            .0018972

                              b = consistent under Ho and Ha; obtained from xtreg
               B = inconsistent under Ha, efficient under Ho; obtained from xtreg

      Test:  Ho:  difference in coefficients not systematic

             chi2(4) = (b−B)'[(V_b−V_B)^(−1)](b−B)
                     =         0.78
             Prob>chi2 =       0.9414
```

DECLARATION

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