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CAPITAL STRUCTURE AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN RWANDA: CASE STUDY OF SELECTED COMMERCIAL BANKS, 2010-2019

A thesis submitted to the school of Business, College of Business and Economics, in partial fulfilment of the requirement for the award of the degree of Master of Business Administration in Finance by the University of Rwanda

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DECLARATION

I declare that this thesis is my original work and has not been presented in any other university

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Abstract

Raising money for investment to keep up with competitive environment at the same time maintaining a healthy capital structure in a company to ensure its financial stability is one of challenging decisions managers are confronted with. Managers should be aware of the financial leverage of their businesses in order avoid any financial distress and whether it affects the financial performance of the firm. Thus, this study was to assess the level of influence of capital structure on financial performance of five selected commercial banks in Rwanda.

To achieve that objective, debt to equity ratio and debt to asset were used to characterize capital structure while financial performance was measured using Return on Equity, Return on Asset, and Net Interest Margin. The study used annual time series data from 2010-2019 in five major commercial banks in Rwanda. By the use of R-program for statistical computing, trend analysis was performed to examine capital structure and financial performance of five selected major commercial banks. In addition, correlation analysis and Ordinary Least Square linear regression analysis were performed to explore the relationship between capital structure and financial performance.

Findings showed that there was positive and statistically significant linear association between ROE and D/E in Bank of Kigali and Equity banks while there was a negative relationship was found in BPR Atlas Mara. The results showed an unstable up-and-down (fluctuation) movement in capital structure indicating that there was no targeted optimum debt to equity ratio (leverage ratio) that any banks aimed to reach –which is contrary to what static trade-off theory of capital structure would predict. In addition, financial performance was also unstable with fluctuation movements in all five banks which indicates a somewhat risky environment for investment.

In regard to the relationship between capital structure and financial performance, the results indicate that there is no common and definite answer to whether the capital structure affect the financial performance. That is to say, the relationship between capital structure and financial performance varies depending on each bank. The findings of this study show that the relationship between capital structure and financial performance is firm specific and cannot be generalized in the banking industry. As such, each bank should analysis its capital structure and its impact on financial performance and take appropriate actions.

Key words: Capital structure, financial performance, commercial banks

Table of Contents

List of Tables

List of figures

CHAPTER ONE: INTRODUCTION

This chapter provides a background of what was to be studied in this study and gives justifications on why it was important to study it. It does also provide objectives of this research. Lastly, it explains the significance as well as the scope of the research.

1.1 Background of the study

Rwanda's banking system is highly intense, at the same time increasingly competitive as Foreign banks has gradually been expanding their operations in the country. A highly competitive and sound banking sector is paramount for the economic development of any given country inasmuch as it promotes capital formation and flow, facilitates monetary policy, as well as influencing economic activities and encouraging innovation (Mishra & Aspal, 2012). Banks in general provide a fundamental role of channeling fund from individual of surplus (namely savers) to individuals with fund shortage thus promoting the economic efficient usage of resource. Moreover, banks exercise control on a big part of the money supply and circulation which influence the overall economic productivity of any country (Rashed & Tamima, 2013).

Banking system in Rwanda is characterized as solvent, profitable, and dominated mostly by commercial banks. Banking sector comprises 66.7 percent share of financial sector assets in Rwanda and commercial banks have grown from three banks before 1994 to eleven (11) banks as of 2019 (Christian & Callixte, 2019). The banking sector is dominated by five major commercial banks (Bank of Kigali, I&M Bank, Equity Bank, BPR Atlas Mara, and COGEBANQUE) with almost 76% of all bank assets in the country (Export.Gov, 2019). Recently, Rwandan banking industry has recorded an annual growth of 11% in net income after tax. Furthermore, the industry average profitability, as measured by Return on Equity, has increased to 10% while the return on asset remained relatively unchanged at 1.7% (I&MBank, 2018).

There are a number of factors that influence financial performance of a particular bank. According to Athanasoglou, Brissimis, and Delis, bank financial performance is influenced by internal (bank specific) and external factors (Athanasoglou, Brissimis, & Delis, 2008). External factors are mostly macroeconomic and industry specifics which are beyond

management control but have strong impact on the bank's profitability. External factors often called exogenous variable are factors such as: economic growth, inflations, market concentration, ownership, etc, just to name a few. On the other hand, efficiency, liquidity, and risk management are some of examples of firm specific factors that influence financial performance. There have been many studies conducted on the internal determinants of bank profitability.

In the quest to understand where Rwandan banks' financial performance comes from, Okello, Memba, and Kigabo in 2008 studied the effect of liquidity on the Rwandan commercial banks' financial performance and found a strong positive influence of profitability as measured by return on assets and return on equity. However, they also found a negative influence on the operation efficiency as measured by net interest margin (Okello, Florence, & Kigabo, 2008). In the study conducted on the effect of banks deposit mobilization on financial performance, it was found that a deposit mobilization through innovative banking technology leads to low cost deposit and increases deposit volume, which in turn, boost the return of asset, return on equity, and net profit as well. In addition, a positive correlation between deposits mobilization and financial performance was found to exist in the commercial banking sector in Rwanda (Richard & Zenon, 2015).

The study conducted on the role of risk management on financial performance of banking institutions in Rwanda revealed that risk management has a profound positive relationship with risk management and financial performance of a bank. That is to say that credit risk, operational risk, and liquidity risk management has a tremendous effect on the financial performance as measured by return on asset, return on equity, and net income (Harelimana, 2017).

As postulated by many researchers, capital adequacy, liquidity, and asset structure are essential to the performance of banks. Capital adequacy measures the availability of capital and is often described by the ratio of capital to the risk weighted assets (weighted credit exposures). Banks in Rwanda have a high capital adequacy of 21% well above the regulatory requirement of 15% (Export.Gov, 2019). The liquidity of the banks also stands at 39%, which is also above the 20% ratio required by the National Bank of Rwanda (I&MBank, 2018). Total assets of the banking sector grow on average by 14% with a large chunk of asset funding being customer deposits.

As a regard to funding structure, banks remain challenged by short term funding. As of June 2017, short-term deposits –deposits with maturity of up to 12, consisted of approximately 85% of the total banks' deposits (I&MBank, 2018). As put forth by Abeywardhana, financing structure is very important and capital structure decision should be carefully analyzed in relation to debt and equity mix (Abeywardhana, 2017).

Capital structure of banks has great impact on the function of the overall financial system because bank funding and financial crises are heavily intertwined (Adrian & Gabriele, 2013). An accumulation of debt due to expansion into risky business areas leads to imbalances in bank funding structures which is reflected into high degrees of leverage. Such excessive recourse to debts financing may trigger deterioration of bank asset quality (Adrian & Gabriele, 2013). Weakness on the asset side of banks' balance sheets pushes firms to get rid of the assets hastily which in turn lead to further decline in asset prices. The sudden decline of asset prices creates a financial distress for the banks and banks' borrowers/lenders which is in turn pervaded the entire financial system. Any distress in financial system which is not carefully addressed may as well lead to financial crisis as observed in 2007.

With the rapidly expanding Rwandan banking sector and constant influx of foreign banks, current banks operating in Rwanda need to be alerted and learn how to quickly raise money for constantly investment in their businesses in order to keep up with the very competitive environment. In doing so, it is important to maintain a healthy capital structure in a company to ensure its financial stability. Since dangerously high level of debts resulting from excessive leverage in both private and public sector have been the main driver of 2008 financial crisis and European sovereign debt crisis, financial regulators and bank management should monitor the financial leverage and its effects on performance in order avoid any financial distress that may result from an excessive financial leverage.

 Though many studies had been conducted to underscore the influence of different factors on banks financial performance in Rwanda, there was no empirical study that explains to what extent capital structure contributed to the overall performance of banks. Therefore, this work was intended to explore whether there is a relationship between the capital structure and financial performance of Rwandan commercial banks.

1.2 Statement of the Problem

The source of money's supply to finance a business endeavors is probably the most important and inescapable decisions managers need to be confronted with at some point. According to Stewart Myers, capital structure decision is a puzzle in as much as selecting between internal sources or external sources is a big challenge given different costs and issues arising to each source (Hashemi & Shivaraj, 2014). There have been interesting debates on capital structure since 1950s with the idea that finding an optimal ratio between equity and debt would minimize the capital cost and would maximize the companies' value (Elena, Georgeta, & Stefan, 2018).

Commercial banks in Rwanda have been struggling to cope with a problem of staggeringly low domestic long-term savings. For instance, as of June 2017, short-term deposits –deposits with maturity of up to 12, consisted of approximately 85% of the total banks' deposits (I&MBank, 2018). Another problem is that Rwandan capital market is small and underdeveloped which makes hard for businesses to accessing long-term financing from the general public (Minecofin, 2013). Compared to regional countries, the size of capital markets (both equities and bonds) in Rwanda amounts to US $ 2,023 million which is far less than US$ 36,707 million in Kenya, US$15,714 million in Tanzania, US $7,146 million in Uganda. On top of that Rwanda StocK Exchange is the youngest in East Africa (Capital Market Authority, 2015). Clearly, Commercial banks in Rwanda have a big problem of limited access to long-term debt financing, which makes capital structure decisions even more challenging.

Another problem is commercial Rwandan banks have reported on average lower profitability levels compared to regional countries particularly Kenya, Uganda and Tanzania. Rwandan banking sector has registered over the years a return on assets of 1.7 percent which is less than 3.6 %, 2.6%, 2% of Kenya, Tanzania and Uganda respectively and return on equity of 10.7 percent which is less than 28.8% of Kenya, 13.9% of Tanzania, and 12.4% of Uganda (Capital Market Authority, 2015).

It is seen, looking on the above numbers, in countries where there has been a better access to long-term capital financial, the banking sector has reported better performance. However, concluding that access to long term capital leads to better performance may be misleading. Thus, researches on the relationship between capital structure and firms' financial performance are needed.

There have been many empirical studies documenting the effects of capital structure on financial performance. However, those studies have not yet provided a conclusive relationship and further researches in the capital structure area have been encouraged (Jawad, Tenveer, Paeman, & Sajid, 2015). For example, the study conducted by Baker H Samuel on risk, leverage and profitability found that firms with higher debt in capital produce better profitability (Baker, 1973). On the contrary, the study performed in Egypt by Ebaid Ibrahim on the relationship between corporate performance and financial leverage found a negative relationship by using ROA and ROE as performance measures (Ebaid, 2009). Khan Abdul Ghafoor studied 36 listed companies from engineering sector in Pakistan and found that "financial leverage, measured using total debt to total assets, has a significant negative relationship with firms' performance (Khan, 2012). Another research was conducted on the impact of financial leverage on corporate financial performance using Pakistan's textile sector and it was also found that financial leverage has a negative effect on the financial performance as far as return of asset is concerned (Khan, 2012).

Despite the importance of capital structure decision especially in an environment with high cost of borrowing and underdeveloped capital market, the relationship between the capital structure and financial performance has not attracted so much attention in Rwanda. In fact, most of the researches on the subject matter have been conducted in countries where capital markets are far developed. Obviously, the deductions from these studies cannot be used for policy formulation and firm-level managerial support in Rwanda as the context is entirely different. Even though many study have tried to evaluate different determinants of corporate financial performance, there is no popular study in Rwanda that have attended to explore if there is any relationship between capital structure and financial performance particularly in banking sector. Therefore, this study attempted to fill this gap by exploring with a reasonable conclusion on whether there is any significant effect played by capital structure on their business financial performance.

1.3 Purpose of the study

The main objective of this study was to assess the level of influence of capital structure on financial performance of selected commercial banks in Rwanda.

1.4 Objectives

Specific objectives of this study were:

1. To examine the capital structure and financial performance trends in selected commercial banks in Rwanda
2. To assess the relationship between capital structure and financial performance of the selected commercial banks

1.5 Research questions

This study was guided by the following questions:

1. What is the trend of capital structure and financial performance in different commercial banks in Rwanda?
2. Is there a relationship between capital structure and financial performance within selected commercial banks?

1.6 Significance of the Study

This study highlights the importance of capital structure in the banking industry. This study answers a critical question of role played by the capital structure on the business performance of any commercial banks in Rwanda. This study was intended to trigger management attention in balancing the disadvantages and advantages of each money source in capital formation. In addition, this study lays a foundation upon which empirical analysis of capital structure should be studied in the context of Rwanda.

1.7 Limitation of the Study

It is important to acknowledge that there are many variables contributing to the financial performance of commercial banks and those variable have been frequently studied in other researches. This research, however, was only intended to explore the level of capital structure contribution to the financial performance in commercial bank sector. It did not in any way attempt to address the whole complexity of multi-variables that influence the commercial banks profitability on one side and could not cover all commercial banks on another side.

CHAPTER TWO: LITERATURE REVIEW

This chapter reviews capital structure concepts, empirical review on capital structure and bank's common financial performance measurements. It also provides the conceptual framework on all variables.

2.1 Capital Structure Theories

Capital structure involves how firms mix debt and equity in order to finance the business with the view that debt to equity ratio have an influence on the business market value. Debt to equity mix (sometimes referred to as leverage ratio) of any firm can have an indication on cost of capital as well as the value of the business. Firms leverage debt in trying to maximize the shareholders' wealth because of the interest paid at debtors is tax deductible, which in turn reduces the debt's effective cost. Nevertheless, the more the debt, the more the firm becomes risky, thus the higher the cost of equity required by investors (Abeywardhana, 2017).

Over the years, matters related to capital structure have been puzzling finance scholars. Much has been written and proposed to what is seemed to be a better explaining theory about capital structure but yet there has not been consensus among researchers. Nonetheless, three major theories namely: tradeoffs theory, pecking order theory, and timing theory have emerged and gained popularity (Hashemi & Shivaraj, 2014).

Irrelevance theory was first introduced by Modigliani and Miller in 1958 and was the first founding theory of the capital structure (Mohdshahid, Rachna, & Khan, 2010). Modigliani and Miller first argued that the value of any firm is not affected by how its capital structure is. This signifies that firms 'owners can have any leverage they want and could possibly get on the market. The theory postulates that the "value of levered firm is the same as unlevered firm". The main implication of this was that there is no optimal debt to equity ratio and matters related to capital structure are irrelevant (Abeywardhana, 2017). Furthermore, they claimed that if the firm's value is dependent on the capital structure, there would be arbitrage opportunities created in the Market (Mohdshahid, Rachna, & Khan, 2010).

In 1966 and 1969, Hirshleifer and Stiglitz contributed to the irrelevance theory by stating that the accumulation of debt increases the risk of the firm, which in turn raises the cost of equity. However, they claimed that the overall cost of the business remains unchanged since the rises in cost of equity is compensated by the low cost of debt (Abeywardhana, 2017). Though the

irrelevance theory provided a simplistic view on firms' capital structure, it provided a foundation for further researches on the subject matter.

Trade off theory was developed out the fact that there are different cost and benefits associated with either using debt or equity. This theory postulates that, in running a business, a decision maker evaluated various cost and benefits of alternative debt and equity mix plans (alternative leverage plans) (Popescu & Visinescu, 2009). Following the recommendation by Modigliani and Miller that firm should borrow as much as possible to benefit from the debt tax shield, it was realized that the benefit of tax shield is to a great extent offset by the costs of financial distress (Hashemi & Shivaraj, 2014).

The trade-off theory sought to explain that each fund source has advantages and disadvantages and there is an optimal capital structure mix, which balances the trade-off, that the firm should strive to achieve. Debt has numerous advantages such as: interest tax shields, a signaling device, it reduces the agency costs related to using equity. It is also argued that probably the critical role of debt is the psychological effect on managers. "Debts reduces the agency cost of management [by] disciplining managers" (Hashemi & Shivaraj, 2014).

On another hand, debt is associated with the problem of increasing the cost of financial distress/ bankruptcy. Borrowing may cause managers to harm debt holders in the interest of equity holders by investing in risky investments or by increasing the debt for the purpose of paying out dividend to shareholders (Popescu & Visinescu, 2009). Moreover, a plethora of debt create a debt overhang problem —a situation whereby good project may be passed on because the debt cannot be raised at the right time due to the already accumulated debts. (Popescu & Visinescu, 2009).

At the onset, the theory focused on explaining that managers mainly strive to balance the tax advantage and higher risk of financial bankruptcy. Later on, they included the agency cost as one of other major factors. Agency costs arise from conflicting interests among various stakeholders of the firm due to information asymmetry. Thus, the inclusion of agency cost into the static trade-off theory implies that firms choose their capital structure by "trading off the tax advantage of debt against the cost of financial distress of too much debt and the agency costs of debt against the agency cost of equity (Popescu & Visinescu, 2009).

The Pecking order theory shifts the focus from the optimal capital structure mix point of view and focuses on the practical evidence of firms preferring internal source of finance over external finance. Internal funds are a result of accumulated earnings or excess liquid assets.

Pecking order theory insinuates that firms choose first accumulated earnings over debt capital. It also suggests that firms use internal funds first and if the internal funds are not sufficient to finance the investment opportunities, then the firms acquire debt and finally as the last option they issue equity capital (Abeywardhana, 2017).

As suggested by Myers and Majluf, the debt ratio of a firm reflect its cumulative picture of external financing and businesses with higher profit and growth opportunities would utilize less debt capital. They also said that firms would retain profits if there are no investment opportunities in order to prevent the future use of external financing (Abeywardhana, 2017). Harris and Raviv, in 1991, claimed that capital structure decisions help to eliminate the inefficiencies created by information asymmetry (Abeywardhana, 2017). Though Fama and Fresh demonstrated empirically that some features of financial data are best described by perking order theory, studies have shown that pecking order theory has not been able to significantly explain firms' capital structure (Rashed & Tamima, 2013).

Market timing theory suggests that capital market conditions have an influence on a firm's capital structure. Market conditions affect the firm's structure in the sense that firms sell new equity shares when they are overvalued and purchase them back when they are undervalued. This price fluctuation of shares eventually does affect the corporate equity ratio, which in turn, affect its capital structure (Popescu & Visinescu, 2009).

Baker and Wurgler argued that market timing theory is consistent with the pecking order theory in that both theories reject the notion that firms move to target a certain leverage ratio. They suggested that equity transactions are quite dependent to stock market conditions. According to Baker and Wurgler, variation in capital structure rose from market timing decisions last long time. Welch found that gearing rations are negatively correlated to past stock returns and he suggested that stock returns is the most important determinant of a firm's capital structure (Abeywardhana, 2017). Hovakimian refuted the above argument by stating that market timing does not have a significant effect on the firms' capital structure in the long run. In fact, he stated "the impact of market timing on gearing will entirely fades within two years" (Popescu & Visinescu, 2009)

Though these theories provide a detailed view and the understanding on how capital structure is formulated and its effect on the value of the firm, they do not explain whether the formulated capital structure has a bearing on the final output of the firm -which is its financial performance. All the above discussed capital structure theories try to explain the effect of

capital structure through the examination of the overall cost of capital employed by a firm and ultimately the value of the firm. However, these theories do not explore deeply the notion that debt has a psychological effect on managers as argued that debt reduces the agency cost of management [by] disciplining managers (Hashemi & Shivaraj, 2014).

After realizing the limitations of capital structure theories described above, few researchers started to explore the role of financial leverage (capital structure) in explaining corporate financial performance. For example, Khan Abdul Ghafoor studied 36 listed companies from engineering sector in Pakistan and found that "financial leverage, measured using total debt to total assets, has a significant negative relationship with firms performance (Khan, 2012). Another research was conducted on the impact of financial leverage on corporate financial performance using Pakistan's textile sector and it was also found that financial leverage has a negative effect on the financial performance as far as return of asset is concerned (Khan, 2012). The above researches advised that managers have to balance between debt and equity financing and keeping all internal and external factors in order to decide the capital structure of a firm.

Despite all the above researches and others, the relationship between the capital structure and financial performance has not attracted so much attention in Rwanda. Therefore, this study examines the capital structure of Rwandan commercial banks and its relationship with financial performance with the hope to provide recommendations to managers and policy implications.

2.2 Factors affecting Capital structure

They are factors that are critical in determining financing decisions. Various studies conducted on the capital structure have found that these factors are often classified as firm's specific and macro-economic factors. Demis Hailegebreal and Man Wang, in their study, have identified that variable such as: firm size, growth opportunity, asset tangibility, financial distress cost as well as profitability are most important determinants of capital structure. on the other hand, the most important macro-economic factors that affect financial decisions are: Gross Domestic Product, Real Interest rate, Inflation rate, and stock market development (Demis & Man, 2018).

Trade-off and pecking order theory give two different perspectives on the effect of profitably on capital structure (debt ratio). According to trade-off theory, highly profitable companies

have high taxable income which should be shielded by the use of more debt. More profitable firms have a high chance of getting loans on favorable conditions. Thus, trade-off theory suggests a positive association between profitability and leverage. On the other hand, pecking order theory suggest that profitability and leverage are negatively related owing to the fact that more profitable companies have internal fund which they prefer to use in place of external finance (Tendai, Miracle, & Mthokozisi, 2016).

Researchers have found that asset tangibility and leverage are positively related due to the fact that firms with more assets are able to provide more collateral to lenders as such they possibly are able to negotiate loans at a lower cost. Moreover, lenders prefer firms with greater collateral because greater collateral presents greater values that can be recovered in the event of default. Contrary, firms with less tangible assets have lower collateral and are likely to access costly loans, which is turn, discourage them from using more debts (Tendai, Miracle, & Mthokozisi, 2016).

Firm size and growth opportunities are other factors that determine the capital financing. According to pecking order theory, bigger companies are attributed to less information asymmetry issues and have a higher probability of employing equity –meaning that negative relationship between size and leverage. However, according to trade-off theory, bigger companies are associated with less risk because of high degree of diversification and stable cash flows which explain less probability of default. This explains that there is a probable positive correlation between size and debt ratio. Growth opportunities is negatively related to debt ratio because growth opportunities are not tangible assets and are less attractive to lenders whereas growth opportunities attract investors thus providing equity financing (Demis & Man, 2018).

Financial distress costs arise from the cost incurred during bankruptcy process or firm reorganization or restructuring. Moreover, financial distress cost includes legal, administration, asset disposing costs, and the cost resulting from conflicts of interest between debtholders and equity holders. As a result, debts have benefits and costs associated with it. Therefore, according to trade off theory, firms move to a target debts equity ratio that optimizes the capital structure (Tendai, Miracle, & Mthokozisi, 2016).

Though firm's specific factors play an important role, one cannot ignore the fact that companies are affected by the country context they operate in. For example, banks are subjected to rigorous regulatory requirements that ultimately affect their financing decision.

Gross Domestic Product, Real Interest rate, Inflation rate, and stock market development are the macro-economic factors that have influence on financing decisions.

Booth and others have found that GDP growth rate increases the "overall debt ratio and long-term debt ratio of firms''. This view is also shared by Korajaczyk and levy who found out that macro-economic factors account for 125 to 515 of variation in leverage financing decisions –an indicator that GDP growth rate positively influence the leverage ratio. Interest rate is arguably the most macro-economic determinant of capital structure. higher interest rates lead to fall in borrowing rates thereby affecting the debt ratio. Therefore, higher interest rate negatively affects the leverage ratio of firms (Demis & Man, 2018).

Dammon found that higher inflation influences some investors to sell their bonds holding in favor of equity thus reducing the debt to equity ratio. In addition, frank and Goyal stated that when inflation rate is high, firms find it easier to replenish their debts. Therefore, Demis Hailegebreal and Man Wang found a positive relationship between inflation and leverage in African firms. In underdeveloped, weak, uncompetitive capital market, companies are confronted with challenges to access equity which leads to high level of debt usage. Strong development stock market is associated with lower debt ratio because firms are able to tap into public fund through equity financing (Demis & Man, 2018).

2.3 Empirical studies on Capital structure

The concept of capital structure received much attention after Modigliani and Miller in 1958 demonstrated that the choice between debt and equity does not have any material effects on the value of the firm. Since then many researches have been undertaken to study the corporate capital structure. In the study conducted by Hoang, Minh, and Hong in order to empirically test capital structure theories on Vietnamese listed companies, it was found that Vietnamese listed companies "follow the trade-off theory to establish their capital structure [which is] they try to determine optimal debt level". The study also found that there was no evidence to support the use of pecking order theory in financing decisions among the Vietnamese companies as it was much anticipated (Hoang, Chi Ho, & Duc Vo, 2019).

In 1999, Shyam-sunder and Stewart Myers wrote a paper on testing static trade-off and pecking order theories in corporate financing decisions. In their research, they used data of one-hundred fifty-seven US firms over a period of 18 years and they analyzed the year-end values of the book debt ratios of each firm. They found that there was enough evidence to

suggest that pecking order model best describes the firm's financing behavior (Lakshmi & Stewart C, 1999). However, when Yu and Aquino tested the validity of the above claim by including the years from 1992 to 2001, they found that firms did follow the trade-off model in selecting their capital structure (Yu & Aquino, 2009).

In a study that used leverage data of 1057 non-financial Chinese listed companies for a period of 11 years from 2000 to 2011, it was found empirically that, for Chinese firms, equity finance tracks the financing deficit better than debt –a revelation that is not consistent with the pecking order theory. In addition, Chinese firms demonstrated a tendency to have an optimal market-based leverage ratio (Liang, Yu Liu, & Hongxian, 2018). On another hand, Frank and Goyal, by using American publicly traded companies date from 1971 to 1998, found out that internal financing was on average insufficient to cover investment expenditures, as a result, external financing was considerably used. Moreover, they found that net equity issues track the financing deficit better than net debt issues do, which is contrary to the pecking order theory (Frank & Goyal, 2003).

With data for 200 listed companies in Malaysia from 2007 to 2012, trade-off theory and the pecking order theory were tested by Razak and Rosli in order to explain financing decision of firms in relation to new debt acquiring. They found that the issuance of new shares was not necessarily triggered by the deficit in internal fund. Therefore, they concluded that the pecking order hypothesis suggesting that firms issue debt to finance internal fund deficit was not statistically supported (Razak & Rosli, 2014).

Wafa Khémiri and Hédi Noubbigh studied capital structure determinants in five Sub-Saharan African Countries namely: South Africa, Zimbabwe, Nigeria, Ghana, and Kenya. Using data from 2006-2016, they found out that firms' capital structure situations are consistent with the predictions of the trade-off and pecking order theories. The study revealed that there is "significant inverse U-shaped relationship between firm's performance and its leverage". In addition, the evidence from the study suggested that macroeconomic factors and past leverage are strong determinants of the prevailing level of debt (Wafa & Hedi, 2018).

The study conducted by Lambert H. de Wet and Sean Joss Gossel on the factors influencing decisions on capital structure in South Africa discovered that Chief Financial Officers tend to follow the pecking order and static trade-off theories. It was also found that small firms were likely to follow the pecking order theory while evidence suggested that large companies favor the static trade-off theory. Moreover, the study suggested that companies in South Africa "are

more likely to follow the static trade-off theory that companies in other emerging countries" (Lambert H. & Seen, 2016).

By using data of 239 listed South Africa companies on capital structure determinants in South Africa, Tendai Gwatidzo, Miracle Ntuli, and Mthokozisi Mlilo found a strong confirmation of pecking order theory through an observed negative relationship between profitability and leverage. Furthermore, they demonstrated that there was a positive relationship between asset tangibility, firm size and leverage in South Africa where capital markets are relatively more developed than the rest of African countries (Tendai, Miracle, & Mthokozisi, 2016).

Demis Hailegrebreal and Man Wang conducted a study on determinant of capital structure of African Firms by using data from non- financial companies from 13 African countries and they found that both static trade off and pecking order theories are evident. In particular, evidence from the study showed that profitability and debt ratio of firms were negatively associated in countries where banking sector and stock market were under or moderately developed and thus proving the pecking order theory. On the other hand, there was a positive and strong relationship between profitability and leverage in companies from relatively developed stock market and banking sector. In addition, the study revealed that factors such as: asset tangibility, financial distress cost, non-debt tax shield, and profitability are firm specific determinants of capital structure. it was also found that banking sector development, corporate tax rate, GDP growth rate, as well as interest rate are the country specific determinant of capital structure (Demis & Man, 2018).

2.4 Banks' Financial performance

Performance of any company can be defined as the extent to which company's objectives are achieved within a period of time. Performance measures can be both qualitative and quantitative. The main purpose of performance measurement is to manage and evaluate progress towards achieving predetermined goals. They are various performance aspects as far as banks are concerned. Banks' performance can be analyzed on multiple fronts such as: on its contribution to common wealth of consumers and businesses, efficiency, and profit generation. Particularly, shareholders view performance in terms of the profits made on their behalf in relation to the risk they took (Jacob A., 2010).

Various studies have been conducted on the analysis of banks performance as a whole and these studies relied on the use secondary data found in financial statements which are readily

available from bank's annual reports (Satish, Mikhail, & Andrery, 2016). Within the Rwandan context, few studies have attempted to analyze and relate banks' performance to other variables.

For example, in the study conducted by Okello, Memba, and Kigabo on the influence of banking sector liquidity on financial performance of commercial banks in Rwanda, it was found that "banking sector liquidity measured by bank deposits has a positive and significant influence on profitability measured by ROA and ROE but a negative significant influence on Cost of operation measured by NIM" (Okello, Florence, & Kigabo, 2008). This clearly showed that Banks performance is affected by the level of liquidity in the sector if the performance was described by profitability. On the other hand, it also showed that if performance was measured by net interest margin, bank deposit would have a negative effect on the cost of operation.

In the study conducted to by Jean Bosco Harerimana in order to investigate the correlation between risk management and financial performance of banking institutions in Rwanda, financial performance was described by return on asset, return on equity, and net income and it was found that there is a strong positive relationship between risk management and financial performance (Harelimana, 2017). The research conducted on financial performance of commercial banks in Ethiopia also used return on equity, return on asset, and net interest margin among others as the measure of bank financial performance (Ashenafi, Tadesse, & Hailemicheal, 2014).

In a research conducted by Niyonsenga and Abuya on the relationship between internal control system and financial performance in financial institution in Rwanda, it was found that internal control system has a strong positive relationship (with a strong correlation of .964) on financial performance of a bank. It was revealed that internal control systems contribute heavily on financial performance in form of increased capital, return on asset, loan and equity, increase in the bank deposit and profitability (Niyonsenga & Abuya, 2017) .

An analysis of financial performance of commercial banks in Rwanda for a period of 5 years from 2008 to 2013 revealed that the commercial banks have done reasonably well whilst the global financial crisis that had affected the general financial system. In the study conducted by Nduwayo antoine on the effect of loan management on the financial performance of commercial banks in Rwanda, it was found that there is a close relationship between loan

management and financial performance as demonstrated by the Bank of Kigali (Antoine, 2015).

Satish, Mikhail and Yukhanaev criticized most researches on bank's performance to lack any consideration of risk element taken by bank institutions in their process of making profits. They argued that most of the researches use return on equity, return on assets and return on capital in attempt to analyzed performance. They stated that "it is imperative to obtain a reliable estimate of returns on investments, but the significant factor –risk taken- was missed". So instead, they developed a framework that uses risk adjusted return on capital and risk adjusted return on equity. They argued that the framework involves a consideration of risk in calculating of risk-adjusted performance measures that have been used in the financial sector as a measure of economic efficiency (Satish, Mikhail, & Andrery, 2016).

2.5 Conceptual Framework

This section briefly illustrates the relationship between variables under this study. It firstly explains the methods for quantifying independent and dependent variables then it is followed by graphical representation of the relationship between variables.

2.5.1 Financial performance

In this study, banks' financial performance was measured by three important ratios which are: Return on Equity, Return on Asset, and Net Interest Margin.

2.5.1.1 Return on Equity

Return on Equity is probably the most important measure of a bank's profitability and growth potential as far as shareholders are concerned. It measures how a business generates a profit in relation to the equity raised. Return on Equity measures the amount of net income after tax that is earned per each unit of money of equity share of capital contributed by banks stockholders. When a company reports a higher return on equity, it increases the price of shares in the capital market and existing shareholders expect higher dividend distribution (Ashenafi, Tadesse, & Hailemicheal, 2014).

It is calculated as $ROE \dfrac{\text{Net Income}}{\text{Equity}}$

Eq (1)

2.5.1.2 Return on Asset

The return on Asset is a measure of how efficiently assets are used to make profit by the business. It determines the net income produced per each unit of assets and is useful to measure profitability linked to the asset size of the bank. It is expressed as net income for each unit of a given asset –which shows how banks assets are converted into earnings. Higher return on asset is appreciated and favourably considered by the owners of the banks. On the other hand, it is usually affected by disposal and acquisition of asset. When the level of asset increase, it is likely that ROA will decrease and vice versa. Contrary to other business organizations, assets of the bank are financial in nature, like loan and Treasury bills, etc. Unlike other profitability ratios, such as return on equity (ROE), ROA measurements include all of a business's assets-; those which arise out of liabilities to creditors as well capital paid in by investors (Jacob A., 2010).

It is calculated as $ROA\dfrac{Net\,Income}{Total\,Assets}$ 　　　　　　　　Eq (2)

2.5.1.3 Net Interest Margin

Net interest margin (NIM) is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin of non-financial companies. Banks are keenly interested in their net interest margins because they lend at one rate and pay depositors at another (Ashenafi, Tadesse, & Hailemicheal, 2014). Basically, net interest margin is a spread between earnings from assets and interest paid out due to liabilities.

It is calculated as $Net\,Interest\,Margin\,(NIM) = \dfrac{(Investmnt\,return - Interest\,Paid)}{Average\,Assets}$ 　Eq (3)

Where Investment return is equal to interest received or return on investment, Interest paid equals to interest paid on the debts, while Average assets equals to assets at the start of the year plus assets at the end of the year divided by two.

2.5.2　Capital structure

In this study, capital structure was characterized by a leverage ratio particularly: debt to equity ratio often referred to as gearing ratio and Debt to Asset. Only these two ratios are used because they capture first the long-term "relationship between borrowed, owner's funds, and assets used to generate returns". Secondly, other ratios are correlated to above-

mentioned ratios since they are derived from them. In addition, gearing ratio is the most important indicator of "financial health of a bank and how over-extended" banks are. According to European Central Bank, "Excessive leverage has been identified as a key driver of the 2007-2011 financial crisis and many past crises" (Jonathan, Micheal, & Jan, 2017). Due to the implication of leverage on the stability of banks and the overall financial system, Basel III capital framework intends to introduce a non-risk base leverage ratio in order to "restrict the build-up of excessive leverage in the banking sector to avoid potential damage on financial system and the broader economy (Jonathan, Micheal, & Jan, 2017).

Debt to Equity (Gearing ratio) formula $= \dfrac{Total\,\text{Debt}}{\text{TotalEquity}}$

Eq (4)

Debt –to-Assets ratio $= \dfrac{Total\,\text{Debt}}{\text{TotalAsset}}$

Eq (5)

Below is a graphical representation of the relationship between variables
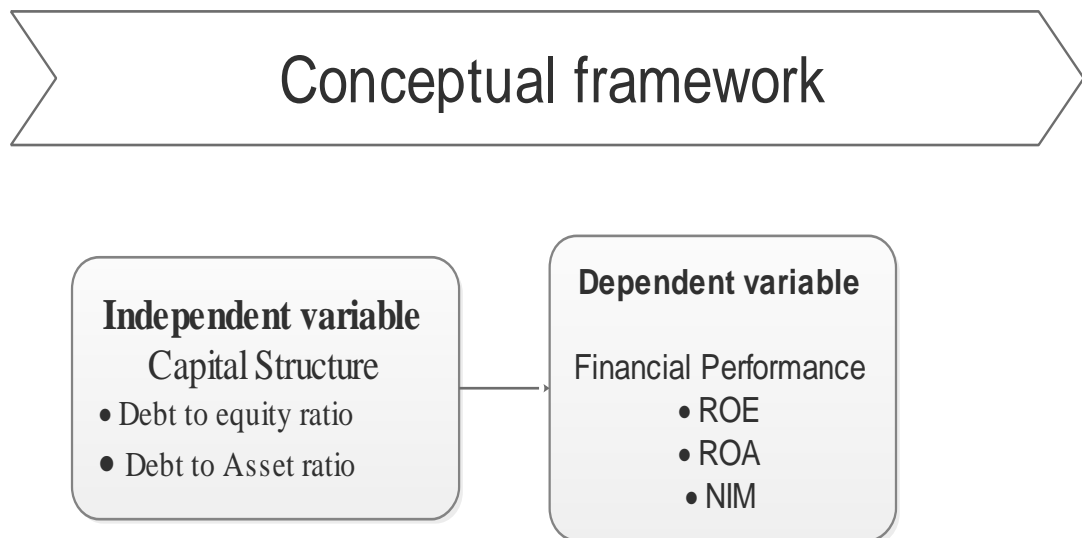
Figure 1: Graphical representation of relationship between independent and dependent variables

CHAPTER THREE: RESEARCH METHODOLOGY/METHODS

This chapter discusses the scientific procedures used to collect relevant information and data in order to address the objectives of this study which is to explore whether there is a statistical significant relationship between capital formation and business performance in a commercial banking sector in Rwanda. It includes the research design, the target population, operationalization of variables, and data analysis methods as well.

2.1 Research Design

According to Manheim and Rich, research design is a systematic plan and structure of investigation that is used to obtain answers to the research questions or objectives. It basically organizes the observations in a way that establish a sound logical basis for casual inferences (Richard & Zenon, 2015).

This study adopted a descriptive and quantitative method to obtain data useful in evaluating existing situation and providing the basis for data analysis and decision making as well. Descriptive research is a process of collecting data in order to test hypothesis or to answer questions concerning a present situation of the subjects in the study. A descriptive study determines and reports the way things exist. It is also used to describe characteristics of a population or phenomena being researched upon (Richard & Zenon, 2015).

The intention of this study was to know what is the trend in capital structure and financial performance of commercial banks in Rwanda and whether there is a correlation between capital formation and business performance in banking sector; the study was not intended in knowing why and how banks choose the capital structure thus the descriptive research is appropriate for this study.

Quantitative method addresses research objectives through empirical evidence that have numerical measurement. This method collects quantifiable information that can be used for statistical analysis of a population. Quantitative method allows a researcher to describe population characteristics. In this study, quantitative method helped in drawing meaningful results from a data in order to describe the nuances of capital structure in the commercial banking sector in Rwanda. Therefore, this study used descriptive research and quantitative methods.

2.2 Target Population and Sample size

Population is a sum of all the persons or objects which are concerned by the study. It also simply means all the possible individual/ objects for which information can be collected. The entire target population of this study constituted of financial reports of all eleven (11) commercial banks in Rwanda. In this study only five banks were studied. Those include: Bank of Kigali PLC, I &M bank, Equity bank Rwanda, BPR Atlas Mara and COGEBANQUE. The reason for picking these five banks was that they are the major banks in Rwanda with almost 76% of all bank assets in the country. Therefore, it was reasonable that these five banks would provide the accurate representation of the commercial banking sector in Rwanda.

2.3 Data Collection

The data used in this study was secondary data obtained from annual financial reports of selected commercial banks in Rwanda. This research was mainly based on secondary data from three audited financial statements namely: statement of financial position, income statement, and statement of changes in Equity.

The study involved ten (10) year's annual time series data for dependent and independent variable. The data were downloaded from website of the banks, annual reports, and other credible source such as Rwanda National Bank.

2.4 Operational definition of variables

Performance measures are similar to those applied in other industries, with return on assets, return on equity or cost-to-income ratio being the most widely used (Ashenafi, Tadesse, & Hailemicheal, 2014). In this study, banks' financial performance was measured by three important ratios which are: Return on Equity, Return on Asset, and Net Interest Margin. Return of Equity enable individuals to measure a bank's profitability and growth potential as far as shareholders are concerned. On other hand, return on assets (RoA) shows the ability of management to acquire assets at a reasonable cost and invest them in profitable investments. In addition, given the importance of the intermediation for banks, net interest margin was typically monitored and was included in the study.

They are multiple ways of describing or evaluating capital structure by using leverage ratios. Leverage ratios are namely: debt-to equity ratio, and debt-to Assets ratio. The most common

among the above ratio is probably the debt-to-equity ratio which is the ratio of total liabilities to total shareholders' equity. A high number of debt-to equity ratio signifies that a firm is aggressive in financing its expansion with debts. The most stressing issue with excessive debt is that it can result in volatile earnings due to interest expense additional. On the other hand, debt-to-Assets ratio is another financial leverage ratio that shows the amount company's total assets that were financed by debts. It is calculated as total debt to total Assets.

2.5 Data Analysis Methods

Trend analysis and regression analysis were used to synthetize and analyze gathered data. Trend analysis was used in assessing the capital structure and financial performance of commercial banks in Rwanda while regression analysis was used in explore whether there is a statistical significant relationship between capital formation and business performance in banking sector.

R Program for Statistical Computing was used as a statistical tool in analyzing the collected data. To measure the relationship between the dependent and independent variables, a single linear regression (OLS) model was used. Single linear regression is method that enables a researcher to study any relationship between an explanatory and a dependent variable. In doing so, the following model was employed:

$$y = \beta_0 + \beta_1 x + \varepsilon \qquad \text{Eq (6)}$$

Where y = dependent variable (financial performance of commercial banks) such as return of equity, return on asset, and net interest margin; β_0 and β_1 were model coefficients while x represents explanatory variables such as: debt-to-equity(gearing ratio) and debt-to-assets ratio, ε is the error term.

2.6 Research Reliability and Validity

Reliability in research refers to how consistent the research instruments used produces equal value while validity refers to the extent the instrument measures what it intends to measure. In this study, Cronbach's Alpha test (internal consistency) of all variable test was performed to determine how well they measure what they intended to measure. As it is clearly seen on the table below, the Cronbach's alpha was good (0.82) which is well above the accepted value of 0.7.

Reliability Statistics	
Cronbach's Alpha	N of Items
0.82	5

Table 1: Reliability test of five variables used in the study

In addition, to ensure reliability of this research, only methods and variables used in other researches were used. Based on how the information and results are presented, if another researcher uses the same methodology and data used in this study she/he would be able to replicate the study. Only published books, articles, and journals were used to ensure that information used in this study is valid. In addition, data was obtained from only published audited financial statements from all commercial banks. Ratios used to measure both independent and dependent variables are those that have been used by other researchers and have been extracted from financial statements as they are in order to avoid any bias. Analysis of data and how conclusions are reached are well presented.

2.7 Ethical consideration

As required in conducting social science research, high professional and ethics consideration was highly kept throughout the research process. The views of other researchers were accurately represented in this research. In addition, data, methods used, and findings were reported accurately. In this research, only credit for original ideas was taken by the researcher at the same time giving credits to others' work. A high degree of professionalism was maintained throughout to ensure that data were used and interpreted accurately. Finally, the study findings were not presented in a manner that suit the researcher's objectives to avoid misleading information, conclusion, and recommendations.

CHAPTER 4: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the findings of the study and the interpretation of the results. Trend analysis, correlation matrix, and linear regression analysis are presented in this chapter and were performed using R program for statistical computing. For all results, discussions are made based on theoretical and empirical views.

4.2. Trend observations for variables

Figure 2 to figure 6 show the trends of variable observed in the five banks under this study. Figure 2 shows Bank of Kigali's variables trend. As it can be seen from the first two graphs (graphs of debt to equity ratio and debt to assets ratio) under figure 2, there is an instability in the capital structure of Bank of Kigali which is reflected in the up and down movement over time. Return on Equity and Return on Asset observed a growth between 2011 to 2014 and a decline from 2014 to 2018. The last graph of figure 2 shows a growing trend in the Net Interest Margin reflecting the spread between earnings from assets and interest paid out due to liabilities.
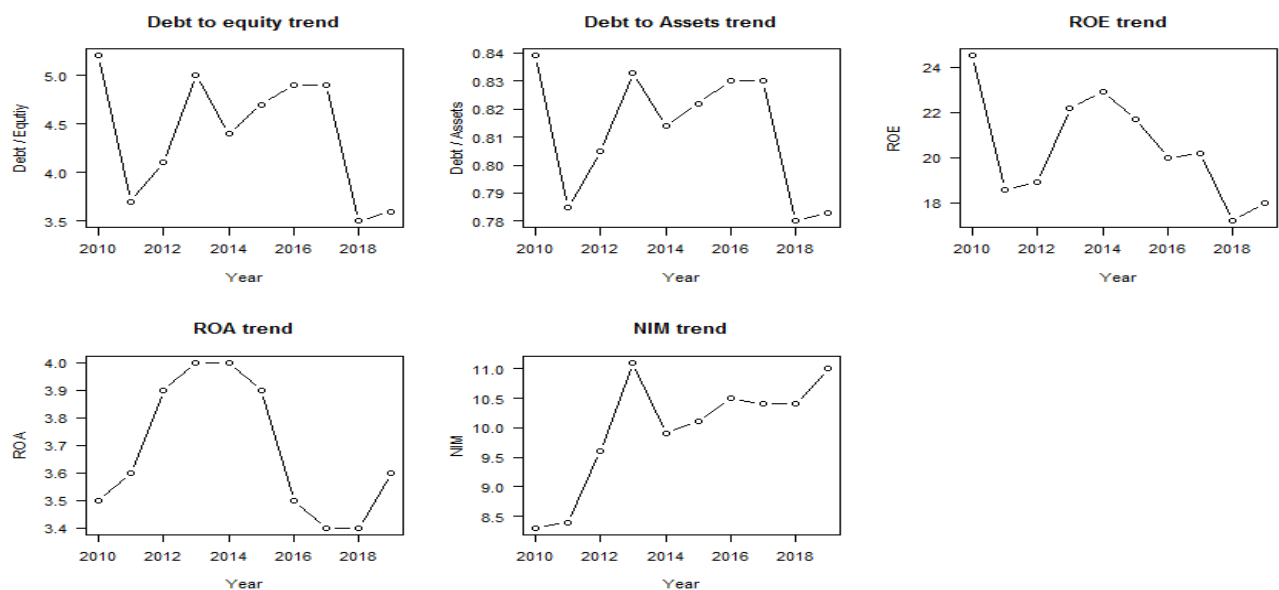
Figure 2 : BK variables trend observation

The below figure 3 presents BPR Atlas Mara's variables trend. The first two graphs (graphs of debt to equity ratio and debt to assets ratio) under figure 3 show an increase in leverage from 2010 to 2013 which followed by a volatile period of up and down movement up to 2016 whereby the bank's leverage started to move upward. Return on Equity and Return on Asset

observed a decline between 2010 to 2013 where investors experienced negative ROE and ROA (up to -37.48% and -3.281% respectively in 2013) and Return on Equity and Return both started to pick up from 2014 and observed a growing trend. The bank experience a relatively volatile movement in Net Interest Margin with a persistent decline from 2016 to 2019.
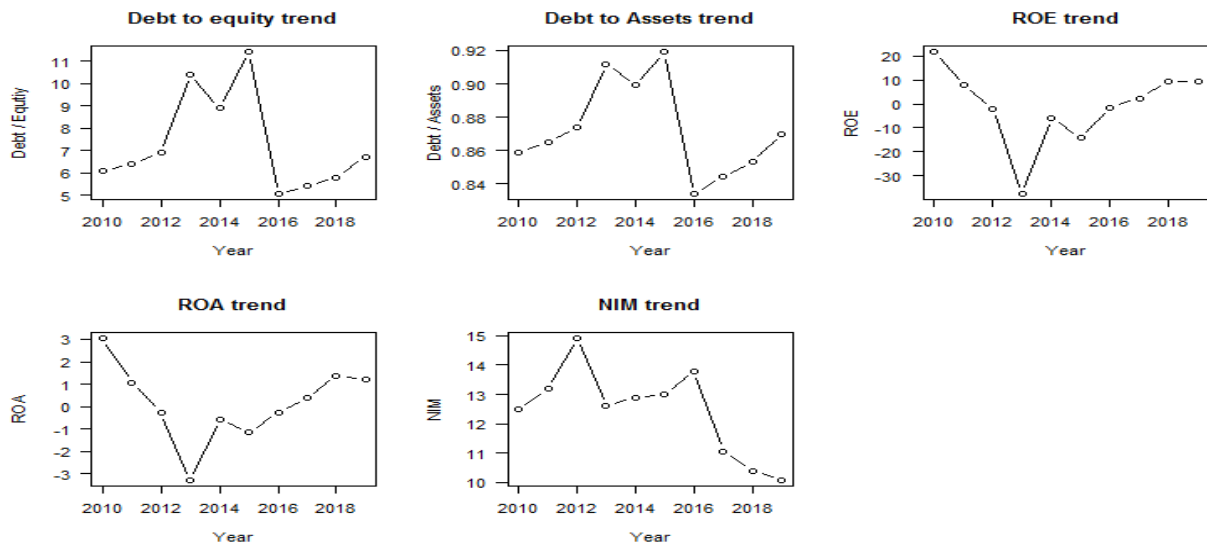
Figure 3: BPR Atlas Mara variables trend observation

The below figure 4 presents Cogebanque variables trend. the first two graphs (graphs of debt to equity ratio and debt to assets ratio) under figure 4 reveal an increase in leverage from 2010 to the pick level in 2014 and 2015. The leverage sharply declined in 2016 and then remained relatively constant up to 2019. As it is clearly seen also in the figure 4, there was fluctuation in ROE and ROA as characterized by the up and down trend movement. There has been a growing trend in the Net Interest Margin over the period of the study.
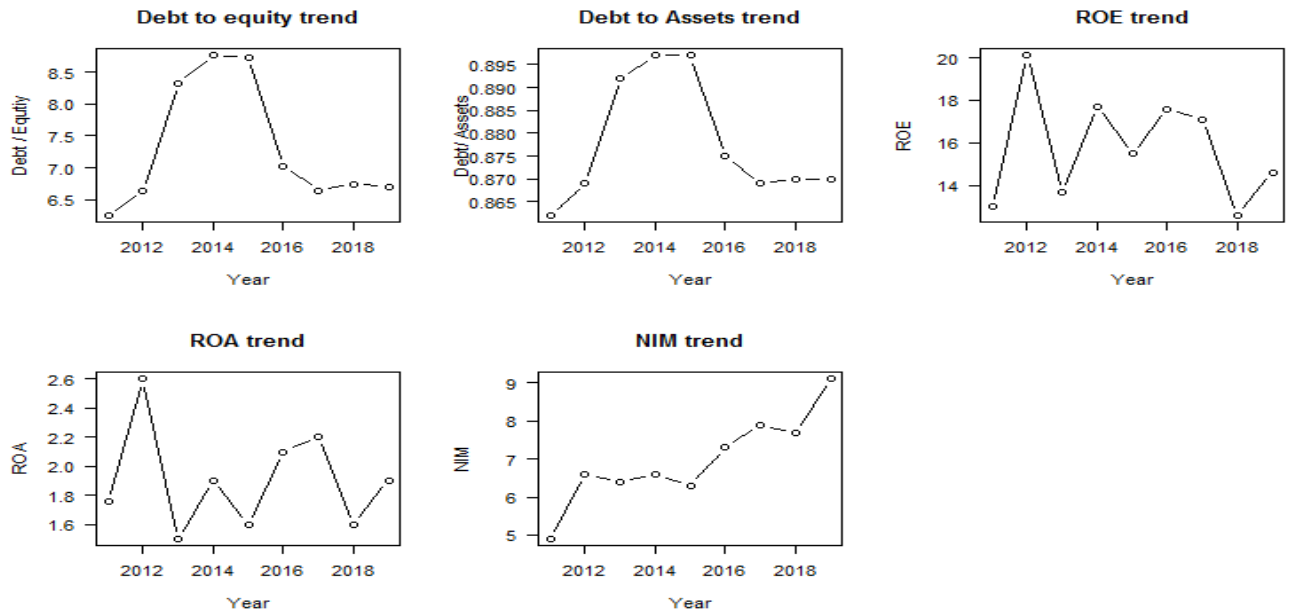
Figure 4:Cogebanque variables trend observation

Equity bank's variables trends over the 5 years' period (from 2015 to 2019) are presented in the below figure 5. The first two graphs (graphs of debt to equity ratio and debt to assets ratio) under figure 5 reveals a growing trend in leverage. The bank clearly experienced a growing trend in financial performance as reflected by trend in ROE, ROA and NIM as well.
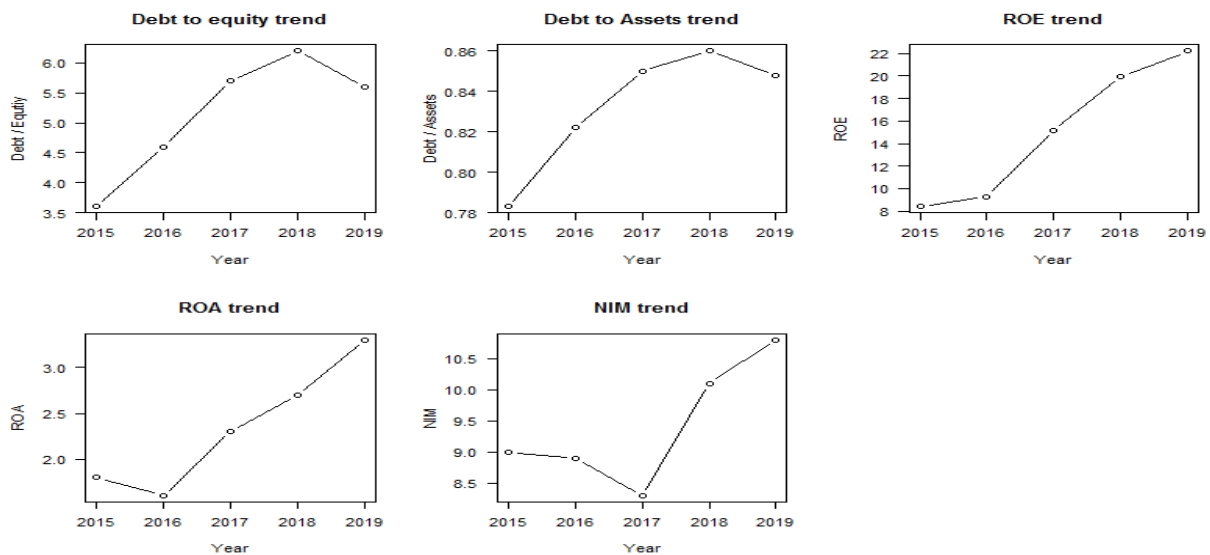
Figure 5: Equity Bank variables trend observation

As it is seen in the figure 6 below, in I&M bank, debt to equity ratio and debt to asset ratio followed a persistent declining trend up to 2013 which followed by a somewhat volatile period until the year 2017 where the bank reached a stable leverage. In regard to financial

performance as measured by ROE, ROA, and NIM, it is seen that the bank experienced unstable returns and changing performance in the net interest margin.
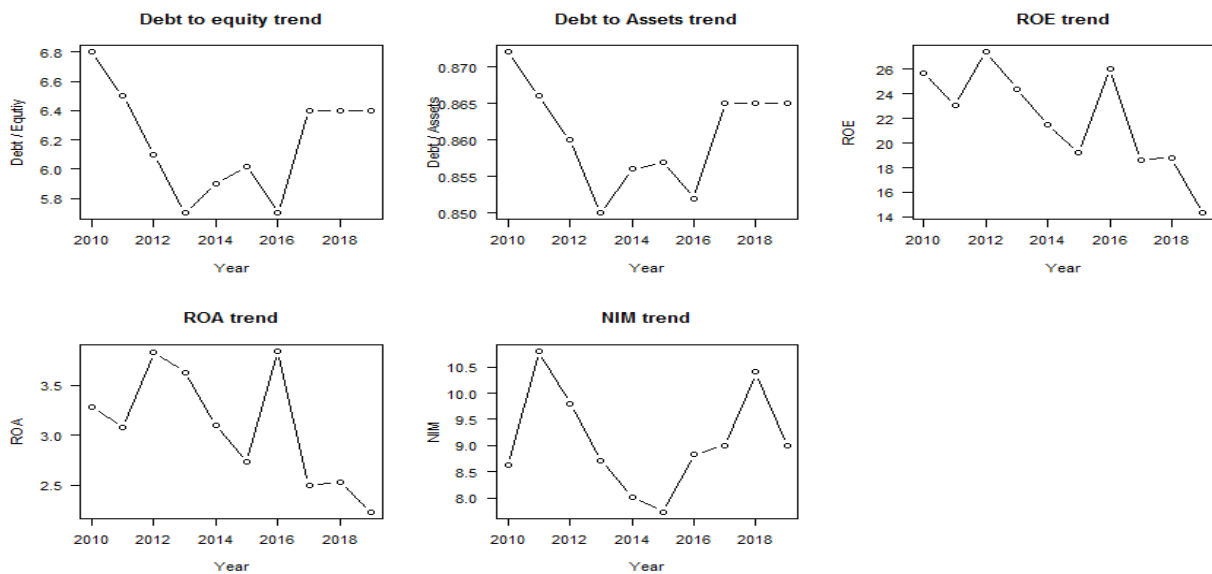
Figure 6: I&M parameters trend Analysis

4.2.1 Capital structure and Financial Performance Trends Analysis interpretations

From the above trend graph, it is seen that there is no common movement of same variables across all five banks. This means that though all banks operate in the same macro-economic environment, performance and capital decisions are predominantly determined by firm's specific factors. There is unstable and unpredictable movement in capital structure in all banks expect for Equity banks. This means that capital structure decisions change year-to-year and that there is no stable optimal targeted debt-to equity ratio as would be suggested by the trade-off theory. Financial performance trends, on the other side, show also volatility in returns as measured by (ROA, ROE and NIM) in all banks under study expect Equity banks. Volatility in returns implies a risky and a rigorous competitive banking environment. A risky environment like this is less attractive to risk-averse investors who prefer a stable return on their investment.

Moreover, Insights from the above figures (2,3,4,5,6) also reveal that debt to asset and debt to equity follow the same trend movement in every bank across the five banks under study. This suggests a possible existence of correlation between debt to equity ratio and debt to assets ratio. Return on Equity and Return on Assets also followed the same trends in all banks except Bank of Kigali which also indicates a possible correlation. It is also to be noted that the Net Interest Margin tends to follow its own trend irrespective of other variables.

4.3. Correlation among variables

Table 1 below shows correlation coefficients between variables in Bank of Kigali. As it can be seen, there is a strong (near perfect correlation) between independent variables –that is to say correlation between debt to equity ratio and debt to asset ratio. There is a weak correlation between independent variable as depicted by observed correlation (ROE ~ ROA with correlation of 0.378, ROE ~NIM with a correlation of -0.273, and ROA ~NIM with a correlation of 0.138). Evidence shows that there is a strong positive correlation between both debt-to-equity, debt to asset, and Return on Equity. Though correlation does not mean causation, the correlation of 0.817 and 0.812 observed between debt to equity and ROE and debt to asset and ROE suggest that there might be relationship between those variables. On the other hand, BK data did not show a strong correlation between debt to equity, debt to asset and ROA, NIM.

	Debt/Equity	Debt /Asset	ROE	ROA	NIM
Debt /Equity	1				
Debt /Asset	0.997282288	1			
ROE	0.817302749	0.81222259	1		
ROA	0.136400801	0.16819973	0.37867694	1	
NIM	-0.025386817	-0.0080171	-0.27334215	0.138547739	1

Table 2: BK variables Correlation matrix

From table 2 below which shows correlation coefficients between variables in BPR Atlas Mara, there is also a near perfect correlation between debt to equity and debt to asset. In addition, a moderate negative correlation was observed between debt-to-equity, debt-to-asset and ROE, ROA. However, the data shows that NIM is uncorrelated to independent variable of this study (debt-to equity and debt-to asset ratio).

	Debt/Equity	Debt/Asset	ROE	ROA	NIM
Debt /Equity	1				
Debt /Asset	0.981090108	1			
ROE	-0.747785432	-0.688266635	1		
ROA	-0.696092646	-0.636456277	0.986064088	1	
NIM	0.197038583	0.190967304	-0.278777572	-0.33141579	1

Table 3: BPR Atlas Mara variables Correlation matrix

Table 3 below shows correlation coefficients between variables in Cogebanque. Data shows also that there is correlation between independent variables. In addition, there is a very weak correlation between debt to equity, debt to asset and return on equity. Moreover, there is a moderate negative correlation between return on asset versus debt to equity and debt to asset. This suggests that there might not be relationship between debt to equity, debt to asset and

ROE, ROA. As realized from BK and BPR data, the NIM also moves uncorrelated to other variables.

	Debt/Equity	Debt/Asset	ROE	ROA	NIM
Debt /Equity	1				
Debt /Asset	0.998601615	1			
ROE	0.07243534	0.091787887	1		
ROA	-0.444188982	-0.427978298	0.854935637	1	
NIM	-0.216291221	-0.181721807	0.075255112	0.17538048	1

Table 4:Cogebanque variables Correlation matrix

In equity bank, as shown in the table 4, there is very strong correlation between independent variables. In addition, there is a moderate positive correlation between debt to equity, debt to asset and return on equity. Moreover, there is also a strong positive correlation between return on asset versus debt to equity and debt to asset. This suggests that there might be relationship between debt to equity, debt to asset and ROE, ROA. NIM registered a very weak correlation to independent variable.

	Debt/Equity	Debt/Asset	ROE	ROA	NIM
Debt /Equity	1				
Debt /Asset	0.991583139	1			
ROE	0.854033134	0.830654675	1		
ROA	0.711416218	0.685196609	0.970217883	1	
NIM	0.395394373	0.372841838	0.755386214	0.802368964	1

Table 5: Equity bank variables Correlation matrix

Table 5 below shows correlation coefficients between variables in I&M bank. Data shows that there is correlation between independent variables. In addition, there is a very weak negative correlation between debt to equity, debt to asset and return on equity. This suggests that there might not be relationship between debt to equity, ROE, ROA. Moreover, there is a fairly negative correlation between return on asset versus debt to equity and debt to asset. NIM registered a very weak correlation to independent variable.

	Debt/Equity	Debt/Asset	ROE	ROA	NIM
Debt /Equity	1				
Debt /Asset	0.994405467	1			
ROE	-0.251444081	-0.25259632	1		
ROA	-0.502813812	-0.50151779	0.951922284	1	
NIM	0.394549299	0.398099478	0.087485162	-0.019761	1

Table 6: I&M variables Correlation matrix

To sum up, the evidence from data tells us that debt to equity ratio and debt to asset ratio are nearly perfect positive correlated in all five banks, which signifies that they move together in

the same direction. This high correlation between debt to equity ratio and debt to asset ratio suggests that these two are somewhat bounded together. This also means that most of the additional capital in all banks are used to finance assets of the banks. In all banks, Net Interest Margin showed no strong correlation to debt to equity ratio.

Debt to equity ratio and debt to asset ratio have been found to be positively correlated to return on Equity in Bank of Kigali and Equity Bank while there has been a negative correlation in BPR Atlas Mara and I&M bank. Data also show that Return on Asset is negatively correlated to debt to equity and debt to asset ratios in BPR Atlas Mara, Cogebanque, and I &M Bank.

During interpretation, it is crucial to keep in mind that correlations may or may not always indicate causal relations. Reversely, causal relations from some variable to another variable may or may not result in a correlation between the two variables.

4.4. **Regression Analysis**

This section presents the results of linear regression analysis of variables in the study. Due to high correlation between debt to equity ratio and debt to asset ratio which suggests that their effects may be somewhat bounded together, a simple linear regression was used to fit the relationship between independent and dependent variables. In the linear regression model, only debt to equity ratio is used to represent the capital structure. So, the following are three types of regression equations for each bank:

1. Regression equation of debt to equity ratio versus return to equity
2. Regression equation of debt to equity ratio versus return to asset
3. Regression equation of debt to equity ratio versus net interest margin

4.4.1 linear regression model for Bank of Kigali

Below table 7 contains the linear regression outcome of return to equity (ROE) against debt to equity ratio (D/E). the result showed the following keys observation:

- return to equity is positively associated with the debt to equity ratio which means that the higher the debt to equity ratio (high leverage) the higher return to equity (financial performance). This linear relationship is statistically significant at 95 % confidence level whereby p-value of 0.00388 is less that significant level of 0.05
- As shown by the coefficient of determination (R^2), 66.8% of variation in return to equity is explained by variation in debt to equity

Based on the above observation, there is a positive relationship between leverage and financial performance as measured by return to equity –that is to say that the more levered Bank of Kigali is, the more return to shareholders.

Table 7: linear regression model of ROE against D/E

	Coef. Estimates	Str. error	t value	p >t
Intercept (β_0)	7.0985	3.3514	2.118	0.06703
D/E coeff. (β_1)	3.0276	0.7547	4.012	0.00388

Residual standard error = 1.436 on 8 degrees of freedom, R^2 =0.668, significant level α = 5%

Below table 8 contains the linear regression outcome of return to asset (ROA) against debt to equity ratio (D/E). the result revealed that There is no statistically significant linear association between the variables since the p-value of 0.707113 is greater than the significant level (0.05). This means that the debt to Equity has no linear association with the return on asset. In addition, the coefficient of determination (R^2=1.8%) showed that an extremely small variation in return to asset is explained by variation in debt to equity. therefore, there was no statistically significant relationship between return to asset and debt to equity ratio. This result is supported by the Irrelevance theory developed by Modigliani and Miller in 1958 which argued that the value of any firm is not affected by how its capital structure is. This signifies that Bank of Kigali can have any leverage they want and could possibly get on the market.

Table 8: linear regression model of ROA against D/E

	Coef. estimate	Str. error	t value	p >t
Intercept (β_0)	3.44906	0.59852	5.763	0.000423
D/E coeff. (β_1)	0.05249	0.13477	0.389	0.707113

Residual str. error = 0.2564 on 8 degrees of freedom, R^2 =0.01861, significant level α = 5%

Below table 9 contains the linear regression outcome of Net Interest Margin (NIM) against debt to equity ratio (D/E).

Table 9: linear regression model of NIM against D/E

	Coef. estimate	Str. error	t value	p >t
Intercept (β_0)	10.14017	2.39112	4.241	0.00283
D/E coeff. (β_1)	-0.03867	0.53843	-0.072	0.94450

Residual str. error = 1.024 on 8 degrees of freedom, R^2 =0.0006445, significant level α = 5%

The above result revealed that there is no statistically significant linear association between the variables since the p-value of 0.9445 is greater than the significant level (0.05). This means that debt to Equity has no linear association with the net interest margin. Moreover, the coefficient of determination (R^2=0.064%) showed that an extremely small variation (close to zero) in return to asset is not explained by variation in debt to equity. Therefore, there was no statistically significant relationship between Net Interest Margin and debt to equity ratio. As it is clearly shown by the result, net interest margin is not influenced by the capital structure in Bank of Kigali, which suggest the spread between earnings from assets and interest paid out to borrowers is not influence by the ratio between debt and equity.

4.4.2 Linear Regression Model for BPR Atlas Mara

Table 10 below contains the linear regression outcome of return to equity (ROE) against debt to equity ratio (D/E).

Table 10: linear regression model of ROE against D/E

	Coef. estimate	Str. error	t value	p >t
Intercept (β_0)	39.450	13.212	2.986	0.0174
D/E coeff. (β_1)	-5.544	1.740	-3.186	0.0129

Residual str. error = 11.36 on 8 degrees of freedom, R^2 =0.5592, significant level α = 5%

The result showed the following keys observation:

- return to equity is negatively associated with the debt to equity ratio which means that the higher the debt to equity ratio (high leverage) the lower return to equity (financial performance). This linear relationship is statistically significant at 95 % confidence level whereby p-value of 0.0129 is less that significant level of 0.05
- As shown by the coefficient of determination (R^2), 55.9% of variation in return to return to equity is explained by variation in debt to equity

Based on the above observation, there is a negative association between leverage and financial performance as measured by return to equity –that is to say that the more levered BPR is, the lower return to shareholders.

Table 11 below contains the linear regression outcome of return to asset (ROA) against debt to equity ratio (D/E)

Table 11: linear regression model of ROA against D/E

	Coef. estimate	Str. error	t value	p >t
Intercept (β_0)	4.1332	1.5085	2.740	0.0255
D/E coeff. (β_1)	-0.5449	0.1987	-2.742	0.0254

Residual str. error = 1.297 on 8 degrees of freedom, R^2 =0.4845, significant level α = 5%

The above result showed the following keys observation:

- Return to asset (ROA) is negatively associated with the debt to equity ratio which means that the higher the debt to equity ratio (high leverage) the lower return to asset (financial performance). This linear relationship is statistically significant at 95 % confidence level whereby p-value of 0.0254 is less that significant level of 0.05

- As shown by the coefficient of determination (R^2), 48.45% of variation in return to return to equity is explained by variation in debt to equity

Based on the above observation, there is also a negative association between leverage and financial performance as measured by return to asset –that is to say that the more levered BPR is, the lower return to asset.

Below table 12 contains the linear regression outcome of Net Interest Margin (NIM) against debt to equity ratio (D/E).

Table 12: linear regression model of NIM against D/E

	Coef. estimate	Str. error	t value	p >t
Intercept (β_0)	11.4413	1.8311	6.248	0.000246
D/E coeff. (β_1)	0.1371	0.2412	0.568	0.585326

Residual str. error =1.575 on 8 degrees of freedom, R^2 =0.3885, significant level α = 5%

The p-value of 0.5853 is greater than the significant level (0.05) which suggests that debt to Equity has no linear association with the net interest margin. Moreover, the coefficient of determination (R^2=0.3885) showed that a small variation in Net interest margin is only explained by variation in debt to equity. Therefore, there was no statistically significant relationship between Net Interest Margin and debt to equity ratio. One can conclude that net interest margin is not influenced by the capital structure in BPR Atlas Mara, which suggest the spread between earnings from assets and interest paid out to borrowers is not influence by the ratio between debt and equity.

4.4.3 linear regression model for Cogebanque

Below table 13 contains the linear regression outcome of return to equity (ROE) against debt to equity ratio (D/E). the result showed the following keys observation:

Table 13:linear regression model of ROE against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	14.4241	7.0445	2.048	0.0798
D/E coeff. (β_1)	0.1836	0.9557	0.192	0.8531

Residual str. error =2.693 on 8 degrees of freedom, R^2 =0.005247, significant level $\alpha = 5\%$

From the above result, the p-value of 0.8531 is far greater than the significant level (0.05) which means that the debt to Equity has no linear association with the return on equity. Furthermore, the coefficient of determination (R^2=0.005247) showed that an extremely small variation in return to equity is explained by variation in debt to equity. As a result, there was no statistically significant relationship between return to equity and debt to equity ratio observed in Cogebanque. The no linear association observed here is coherent to the Irrelevance theory which argued that the firm performance is not affected by how its capital structure is. This signifies that Cogebanque can have any leverage they want and could possibly get on the market. Moreover, the result does not the argument by the tradeoff theory that debts reduce the agency cost of management by disciplining managers.

Table 14: linear regression model of ROA against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	3.0470	0.8765	3.476	0.0103
D/E coeff. (β_1)	-0.1560	0.1189	-1.312	0.2310

Residual str. error =0.3351 on 7 degrees of freedom, R^2 =0.1973, significant level $\alpha = 5\%$

From the above table 14 the p-value of 0.2310 is far greater than the significant level (0.05) which suggests that there was no statistically significant linear association between debt to equity ratio (D/E) and the return to asset (ROA). In addition, the coefficient of determination (R^2=0.1973) showed that a large variation in return to asset is not explained by variation in debt to equity. Thus, there was no statistically significant relationship between return to asset and debt to equity ratio. This result supported by the Irrelevance theory by Modigliani and Miller which argued that the value of any firm is not affected by how its capital structure is.

This signifies that Cogebanque can have any leverage they want and could possibly get on the market.

Table 15: linear regression model of NIM against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	8.8704	3.2555	2.725	0.0296
D/E coeff. (β_1)	-0.2589	0.4417	-0.586	0.5762

Residual str. error =1.245 on 7 degrees of freedom, R^2 =0.04678, significant level α = 5%

The p-value of 0.5762 is greater than the significant level (0.05) which suggests that debt to Equity has no linear association with the net interest margin. Moreover, the coefficient of determination (R^2=0.04678) showed that a small variation in Net interest margin is only explained by variation in debt to equity. Therefore, there was no statistically significant relationship between Net Interest Margin and debt to equity ratio. As it is clearly shown by the result, net interest margin is not influenced by the capital structure in Cogebanque, which suggest the spread between earnings from assets and interest paid out to borrowers is not influence by the ratio between debt and equity.

4.4.4 linear regression model for Equity Bank

Below table 16 contains the linear regression outcome of return to equity (ROE) against debt to equity ratio (D/E).

Table 16: linear regression model of ROE against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	-11.058	9.312	-1.187	0.3205
D/E coeff. (β_1)	5.070	1.783	2.843	0.0355

Residual str. error =3.702 on 3 degrees of freedom, R^2 =0.7294, significant level α = 5%

The result showed the following keys observation:

- return to equity is positively associated with the debt to equity ratio which means that the higher the debt to equity ratio (high leverage) the higher return to equity (financial performance). This linear relationship is statistically significant at 95 % confidence level whereby p-value of 0.0355 is less that significant level of 0.05.
- As shown by the coefficient of determination (R^2), 0.7294% of variation in return to equity is explained by variation in debt to equity.

Based on the above observation, there is a positive relationship between leverage and financial performance as measured by return to equity –that is to say that the more levered Equity Bank is, the more return to shareholders.

Table 17: linear regression model of ROA against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	-0.08219	1.40382	-0.059	0.957
D/E coeff. (β_1)	0.47124	0.26877	1.753	0.178

Residual str. error = 0.5581 on 3 degrees of freedom, R^2 =0.5061, significant level α = 10%

The result suggests that there was no statistically significant linear association between debt to equity ratio (D/E) and the return to asset (ROA) since the p-value of 0.178 is greater than the significant level (0.05). This means that when capital performance is measured by the debt to equity, there is no effect on the financial performance when it is measure by the debt to asset. This result supported by the Irrelevance theory which argued that the value of any firm is not affected by how its capital structure is. This signifies that Equity Bank can have any leverage they want and could possibly get on the market.

Table 18: linear regression model of NIM against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	7.4460	2.6904	2.768	0.0697
D/E coeff. (β_1)	0.3840	0.5151	0.746	0.5100

Residual str. error = 1.07 on 3 degrees of freedom, R^2 =0.1563, significant level α = 5%

The above table (18) shows that the p-value of 0.5100 is greater than the significant level (0.05) which suggests that Debt to Equity (D/E) has no linear association with the net interest margin (NIM). Moreover, the coefficient of determination (R^2=0.1563) showed that a small variation in Net interest margin is only explained by variation in debt to equity. Therefore, there was no statistically significant relationship between Net Interest Margin and debt to equity ratio. As it is clearly shown by the result, net interest margin (as a measure of financial performance) is not influenced by the capital structure as measured by debt to equity in Equity Bank, which suggest the spread between earnings from assets and interest paid out to borrowers is not influence by the ratio between debt and equity.

4.4.5 linear regression model for I&M Bank

Below table 19 contains the linear regression outcome of return to equity (ROE) against debt to equity ratio (D/E).

Table 19: linear regression model of ROE against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	39.614	24.134	1.641	0.139
D/E coeff. (β_1)	-2.859	3.891	-0.735	0.483

Residual str. error =4.266 on 8 degrees of freedom, R^2 =0.06322, significant level α = 5%

From the above result, the p-value of 0.483 is far greater than the significant level (0.05) which means that the debt to Equity has no linear association with the return on equity. Furthermore, the coefficient of determination (R^2=6.322%) showed that an extremely small variation in return to equity is explained by variation in debt to equity. As a result, there was no statistically significant relationship observed between financial performance as measured by return to equity and capital structure as quantified by debt to equity ratio. The no linear association observed here is coherent to the Irrelevance theory which argued that the firm performance is not affected by how its capital structure is. This signifies that the bank can have any leverage they want and could possibly get on the market. Moreover, the result does not the argument by the tradeoff theory that debts reduce the agency cost of management by disciplining managers.

Table 20: linear regression model of ROA against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	7.9667	2.9778	2.675	0.0281
D/E coeff. (β_1)	-0.7900	0.4802	-1.645	0.1385

Residual str. error =0.5264 on 8 degrees of freedom, R^2 =0.2528, significant level α = 5%

The result suggests that there was no statistically significant linear association between debt to equity ratio (D/E) and the return to asset (ROA) since the p-value of 0.1385 is greater than the significant level (0.05). In addition, the coefficient of determination (R^2=25.28%) showed that a small variation in return to asset is only explained by variation in debt to equity. This means that when capital performance is measured by the debt to equity, there is no effect on the financial performance when it is measure by the debt to asset. This result supported by the Irrelevance theory which argued that the value of any firm is not affected by how its capital

structure is. This signifies that bank can have any leverage they want and could possibly get on the market.

Table 21: linear regression model of NIM against D/E

	Coef. estimates	Str. error	t value	p >t
Intercept (β_0)	2.5641	5.3835	0.476	0.647
D/E coeff. (β_1)	1.0543	0.8681	1.214	0.259

Residual str. error =0.9516 on 8 degrees of freedom, R^2 =0.1557, significant level α = 5%

The p-value of 0.259 is greater than the significant level (0.05) which suggests that debt to Equity has no linear association with the net interest margin. Moreover, the coefficient of determination (R^2=0.1557) showed that a small variation in Net interest margin is not explained by variation in debt to equity. Therefore, there was no statistically significant relationship between Net Interest Margin and debt to equity ratio. As it is clearly shown by the result, net interest margin is not influenced by the capital structure in the bank, which suggest the spread between earnings from assets and interest paid out to borrowers is not influence by the ratio between debt and equity.

4.5 Regression and Correlation Analysis Interpretations

Results from the correlation regression analysis are summarized in the table below.

Bank name	Correlation			Linear regression	
BK		D/E	D/A		D/E
	ROE	Strong positive	Very weak positive	ROE	Positive and statistically significant association
	ROA	Strong positive	Very weak positive	ROA	No statistically significant association
	NIM	Very weak negative	Very weak negative	NIM	No statistically significant association
BPR Atlas Mara		D/E	D/A		D/E
	ROE	Moderate negative	Moderate negative	ROE	negative statistically significant association
	ROA	Moderate negative	Moderate negative	ROA	negative statistically significant

37

		D/E	D/A		D/E
					association
	NIM	Very weak positive	Very weak positive	NIM	No statistically significant association
Cogebanque		D/E	D/A		D/E
	ROE	Very weak positive	Very weak positive	ROE	No statistically significant association
	ROA	Weak negative	Weak negative	ROA	No statistically significant association
	NIM	Very weak negative	Very weak negative	NIM	No statistically significant association
Equity bank		D/E	D/A		D/E
	ROE	Strong positive	Strong positive	ROE	Positive statistically significant association
	ROA	Strong positive	Strong positive	ROA	No statistically significant association
	NIM	Weak positive	Weak positive	NIM	No statistically significant association
I &M bank		D/E	D/A		D/E
	ROE	Very weak negative	Very weak negative	ROE	No statistically significant association
	ROA	Moderate negative	Moderate negative	ROA	No statistically significant association
	NIM	Weak positive	Weak positive	NIM	No statistically significant association

Table 22:Summary of correlation and regression analysis

- Evidence from correlation matrix tables, shows that debt to equity ratio and debt to asset ratio are nearly perfect positive correlated in all five banks, which supports the observed same trend movements in the two variables.

- Debt to equity (*D/E*) ratio and debt to asset (*D/A*) ratio were found to be positively correlated to Return on Equity in Bank of Kigali and Equity Bank while there was a negative correlation in BPR Atlas Mara. Data also show that Return on Asset is negatively correlated to debt to equity and debt to asset ratios in BPR Atlas Mara, Cogebanque, and I &M Bank.

- There was no correlation between Net Interest Margin and any other variables

- There was positive and statistically significant linear association between Return to Equity and Debt to equity ratio in Bank of Kigali and Equity Bank. This suggests that the more levered these banks are the higher return to investors. This is consistent with the study conducted by Baker H Samuel on risk, leverage and profitability that firms with higher debt in capital produce better profitability (Baker, 1973).

  On the contrary, there was a negative and statistically significant linear relationship between ROE and D/E ratio and between ROA and D/E in BPR Atlas Mara, which indicate the higher the leverage the lower return. This is also consistent with the study performed in Egypt by Ebaid Ibrahim on the relationship between corporate performance and financial leverage. The study also found a negative relationship by using ROA and ROE as performance measures (Ebaid, 2009).

  Lastly, the result showed no statistically significant linear relationship between ROE and D/E ratio in Cogebanque and I&M bank.

- There was no statistically significant linear relationship between Return on Asset and Debt to Equity ratio in all banks except BPR Atlas Mara where a negative and statistically significant linear relationship was observed.

- There was no statistically significant linear relationship between Net Interest Margin and Debt to Equity ratio in all banks.

CHAPTER 5: RESEARCH SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents major findings of the study with respect to the research objectives and questions. Conclusions are drawn based on the research findings and the theory relating to the subject matter. In addition, recommendations and suggestions for further researches are presented.

5.1: Research Findings Summary

This section summarizes the research findings according to the research objectives.

✓ **To examine the capital structure and financial performance trends in selected commercial banks in Rwanda**

The results showed an unstable up-and-down (fluctuation) movement in capital structure. This unstable and unpredictable movement in capital structure means capital structure decisions change year-to-year and that there is no stable optimal targeted debt-to equity ratio as would be suggested by the trade-off theory. It was also seen that there is no common movement of same variables across all five banks. This means that though all banks operate in the same macro-economic environment, performance and capital decisions are predominantly determined by firm's specific factors. Financial performance trends, on the other side, show also volatility in returns as measured by (ROA, ROE, and NIM) in all banks under study expect Equity banks. Volatility in returns implies a risky and a rigorous competitive banking environment. A risky environment like this is less attractive to risk-averse investors who prefer a stable return on their investment

✓ **To assess the relationship between capital structure and financial performance of the selected commercial banks**

- There is a relationship between capital structure and financial performance in Bank of Kigali and Equity Bank because findings indicate that there was positive and statistically significant linear association between Return to Equity and Debt to equity ratio in these banks. This indicates that This suggests that the more levered these banks are the higher return to investors. On the contrary, there was a negative and statistically significant linear relationship between ROE and D/E ratio and between ROA and D/E in BPR Atlas Mara, which indicate the higher the leverage the lower

return. Lastly, the result showed no statistically significant linear relationship between ROE and D/E ratio in Cogebanque and I&M bank.

- Results also showed that there was no statistically significant linear relationship between Return on Asset and Debt to Equity ratio in all banks except BPR Atlas Mara where a negative and statistically significant linear relationship was observed.

- The study found that there was no statistically significant linear relationship between Return on Net Interest Margin to Equity ratio in all banks.

5.2: Conclusion

The main objective of this study was to explore whether there is a relationship between the capital structure and financial performance in selected Rwandan commercial banks. To achieve this objective, an analysis of capital structure and financial performance trends was first explored and the results showed an unstable up-and-down (fluctuation) movement in capital structure. This means that there was no targeted optimum debt to equity ratio (leverage ratio) that any banks aimed to reach –which is contrary to what static trade-off theory of capital structure would predict. In addition, financial performance was also unstable with fluctuation movements in all banks. This fluctuation in return insinuates a somewhat risky environment for investment.

In regard to the relationship between capital structure and financial performance, the results indicate that there is no common and definite answer to whether the capital structure affect the financial performance. That is to say, the relationship between capital structure and financial performance varies depending on each bank. For example, in this study, Bank of Kigali and Equity bank, return to Equity and Debt to equity ratio were positively associated, which suggests that the more levered these banks are the higher return to investors. On the contrary, there was a negative relationship between ROE and D/E ratio in BPR Atlas Mara. Many researches have been conducted and theories have been developed and all of them seem to have no common overall agreement regarding the matter. The findings of this study show that the relationship between capital structure and financial performance is firm specific and cannot be generalized in the banking industry. As such, each bank should analysis its capital structure and its impact on financial performance and take appropriate actions.

5.3: Recommendations

According to the research analysis and findings, Bank of Kigali and Equity bank should closely monitor their capital structure since their returns are positively related to the

prevailing gearing (debt to equity ratio). These banks should try to find the optimum leverage ratio that balance the advantages and disadvantage of using excessive debts (tax advantage and higher risk of financial bankruptcy). In addition, BPR Atlas Mara should try to balance its debts as they are negatively associated with the return.

On the other hand, the result suggests that Cogebanque and I&M bank's managers should have any leverage they want and could possibly get on the market without worrying much on the effect of the financial performance because there is no statistically significant linear relationship between capital structure and financial performance observed in these banks.

Moreover, all banks should try to minimize fluctuations in their financial performance in order to improve a somewhat risky environment for investment.

5.4 Suggestions for Further Studies

This study relied on the accounting measures of financial performance and capital structure which are subject to management manipulation and reporting policies. Therefore, further researches which use market based measures such as Tobin's Q are encouraged to provide more insights and truth on the subject. In addition, this study solely focused on the relationship between capital structure and financial performance and it did not attempt to ask whether the prevailing capital structure in the above banks are optimal. As such, researches on the capital structure optimality are needed to determine whether the held proportions of equity and debt are the most effective to the banks.

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Appendix: Annual time series data of selected banks

Years	Debt/Equity	Debt/Asset	ROE (%)	ROA (%)	NIM
2010	6.1	0.859	21.6	3.03	12.48
2011	6.4	0.865	7.8	1.05	13.2
2012	6.9	0.874	-2.02	-0.255	14.9
2013	10.4	0.912	-37.48	-3.281	12.6
2014	8.9	0.899	-5.72	-0.576	12.9
2015	11.4	0.919	-14.2	-1.151	13
2016	5.06	0.834	-1.59	-0.263	13.8
2017	5.4	0.844	2.4	0.379	11.07
2018	5.8	0.853	9.4	1.38	10.4
2019	6.7	0.87	9.3	1.21	10.08

Annual time series data of Bank of Kigali

years	Debt/Equity	Debt/Asset	ROE (%)	ROA (%)	NIM
2010		blank			
2011	6.25	0.862	13	1.76	4.9
2012	6.64	0.869	20.1	2.6	6.6
2013	8.32	0.892	13.7	1.5	6.4
2014	8.76	0.897	17.7	1.9	6.6
2015	8.73	0.897	15.5	1.6	6.3
2016	7.02	0.875	17.6	2.1	7.3
2017	6.64	0.869	17.1	2.2	7.9
2018	6.74	0.87	12.6	1.6	7.7
2019	6.7	0.87	14.6	1.9	9.1

Annual time series of Cogebanque

years	Debt/Equity	Debt/Asset	ROE (%)	ROA (%)	NIM
2010					
2011					
2012					
2013		blank			
2014					
2015	3.6	0.783	8.4	1.8	9
2016	4.6	0.822	9.3	1.6	8.9
2017	5.7	0.85	15.2	2.3	8.3
2018	6.2	0.86	19.9	2.7	10.1
2019	5.6	0.848	22.2	3.3	10.8

Annual time series data of Equity Bank Rwanda

years	Debt/Equity	Debt/Asset	ROE (%)	ROA (%)	NIM
2010	6.8	0.872	25.7	3.28	8.62
2011	6.5	0.866	23.1	3.08	10.8
2012	6.1	0.86	27.4	3.83	9.8
2013	5.7	0.85	24.4	3.63	8.72
2014	5.9	0.856	21.5	3.1	8.02
2015	6.02	0.857	19.2	2.73	7.73
2016	5.7	0.852	26.07	3.84	8.83
2017	6.4	0.865	18.6	2.5	9
2018	6.4	0.865	18.81	2.53	10.4
2019	6.4	0.865	14.3	2.23	9

Annual time series data of I &M bank

Years	Debt/Equity	Debt/Asset	ROE (%)	ROA (%)	NIM
2010	6.1	0.859	21.6	3.03	12.48
2011	6.4	0.865	7.8	1.05	13.2
2012	6.9	0.874	-2.02	-0.255	14.9
2013	10.4	0.912	-37.48	-3.281	12.6
2014	8.9	0.899	-5.72	-0.576	12.9
2015	11.4	0.919	-14.2	-1.151	13
2016	5.06	0.834	-1.59	-0.263	13.8
2017	5.4	0.844	2.4	0.379	11.07
2018	5.8	0.853	9.4	1.38	10.4
2019	6.7	0.87	9.3	1.21	10.08

Annual time series data of BPR Atlas Mara