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Do Gambian Banks Source Financing for Investments in Line with the Predictions of the Pecking Order Theory?

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Abstract

The pecking order theory contends that firms would rather source financing first through retained earnings, followed by debt and finally equity in that order. This implies shareholders are reluctant to dilute equity holdings, but would rather borrow for investments than risks impairment of the proportion of company holdings. This paper is an empirical study on sources of finance for investment in an environment without a capital market. It seeks answers to the research question on the determinants of investment, such as internally generated revenue, debt and equity and its link to the predictions of the pecking order theory. The study reviews secondary data from the audited financial statements of the twelve commercial banks in the country, covering the period 2005 – 2018 and using among others, ordinary least squares (OLS) regression in an unbalanced panel data, through the statistical software Eviews. Findings are that the determinants of investment include firm-specific variables, such as equity, profitability, firm size, leverage, non-performing loans and liquidity. There is no evidence of observance of the pecking order theory in the sourcing of external financing by banks in The Gambia. The study enriches the literature on the determinants of investments and its link with the pecking order theory in an environment without a capital market.

Key words: pecking order theory, investments, equity, firm size, debt, capital market.

1.0 Introduction

The literature shows divergent views on whether or not firms prefer particular types of instruments as sources of finance to others. The pecking order hypothesis contends that firms would rather source financing first through retained earnings, followed by debt and finally equity, in that order (Jibran et al, 2012).

This study investigates the capital structure of Gambian banks, to determine if, as non-listed firms, they still follow the pattern of capital structure proposed by the pecking order theory. Previous investigations of the pecking order theory and capital structure focused mainly on listed firms in advanced economies. Haron (2014) observed that despite the increasing presence in the literature of studies from developing countries, the bulk of studies have focused on advanced economies (USA and Europe), due to market imperfections and inefficiency in developing countries. This study is on The Gambia, a country without a capital market, of which the institutions under review (commercial banks), are not listed in any stock exchange except one listed in a foreign capital market. Notwithstanding the foreign listing of one of the institutions, banks in The Gambia generally source equity through private placements, or issuance of shares (rights issue) to investors in their home countries[1]. They are also exposed to debt financing (borrowings or issuance of debentures), and organic growth through retained earnings.

This study explores sources of financing for investments within the banking industry in The Gambia. The study has significance due to the following policy implications:

- If the pecking order theory holds, equity may not be the preferred source of financing and could have implications for banks as issuers in the proposed capital market;
- On the other hand, excessive popularity of equity financing among banking institutions, could result in dominance and crowding out of issuers in the real sector of the economy.

The main object behind the establishment of a capital market is the channeling of funds to the real sector to enhance infrastructural development. The ideal situation is where the current dominance of the money market by banks is not extended to the capital market, as it could defeat

[1] The majority of banks in The Gambia are foreign owned and often source financing from their home countries due in part to the absence of a platform for raising long-term funds.

the above objective. Banks tend to lend on short-term basis, while the real sector engaged in infrastructural development is better of sourcing long-term finance from capital markets. CBN (2013) defines the real sector as that which is responsible for the production and distribution of goods and services (from a combination of factor resources), necessary to meet the consumption demand of an economy. The AfDB-WB (2017: 9) noted the limited natural resources in the country, with agriculture being the largest sector, while other forms of sectoral infrastructure are underdeveloped and highly vulnerable to weather-related shocks. This is a reference to the infrastructure deficit in the country and the dire need to address the challenges through long-term financing.

1.1 Justification of study

This study tests the predictive validity of the pecking order theory among Gambian banks, a country on the verge of establishment of a capital market. In all, there are twelve commercial banks in the country, the annual data of which are explored in an unbalanced panel data covering the period 2005 – 2018.

While the pecking order theory is based on the assumption of perfect information flow, ideally in a capital market environment, this could not invalidate the results of studies in environments without capital markets, as in The Gambia. The pecking order theory has generally been tested under conditions where capital markets exist, although conditions in developing countries have come under criticism by a number of authors. Baron (2014) argue that there are market imperfections and inefficiency in developing countries. Gyamfi et al (2017) also posit that even where markets exist, they are still prone to inefficiency, with most experiencing increases in market capitalization, membership, value and volume traded, but the results are mixed regarding improvements in their information efficiency. Capital markets exist in part to boost information flow between investors and issuers, pursuant to efficiency. Gyamfi et al (2017) went on to disaggregate the efficient market hypothesis (EMH) into three forms, namely information efficiency, allocative efficiency and operational efficiency. This is an extension of the information efficiency advanced by Fama (1965).

From above, it is apparent that capital markets do not necessarily deliver on the intended perfect information efficiency. Afego (2015) reported that the South African stock market was adjudged to have achieved a weak-form efficiency through the work of Simons & Laryea (2005). Contradictory findings were registered through the work of Smith (2008), which concluded that

the South African stock market is inefficient in any of the forms envisaged by the EMH. The results are therefore inconclusive and while the debate rages on, this study explores the pecking order theory, albeit not under conditions of a formal capital market. The next part presents arguments in favour of the need to explore environments without capital markets.

1.2 Why relax the need for an organized / formal equity market

A country without a capital market effectively lacks a deepened financial system, defined by the size of financial markets relative to economic activities, functions such as intermediation, price discovery and hedging (IMF-Global Financial Stability Report, 2014, p.75). Capital markets are effectively organized / formal platforms for the sharing of information between issuers and investors, to facilitate price discovery and trade. Riding on this principle, the pecking order theory involves listed firms issuing shares through capital markets when in need of finance, thus the focus by previous studies on listed firms. In cases without capital markets, as in The Gambia, shares are issued through private placements, i.e. where firms are not listed entities. This paper contends that due to the amount of information disclosures contained in the annual financial statements, and the mandatory quarterly publication of lending and deposit rates, there is reasonable market information for investors to consider. Besides, Charoenwong et al (2014) in their study of the relationship between asset liquidity and stock liquidity, found that investors rely more on a firm's asset liquidity to value the firm in countries with poor accounting and or information environments. While such environments are admittedly informal and lack centralized trading platforms, informal trade[2] does take place. For instance, the disclosure requirements include invaluable information such as price earnings ratio, which can be used to compute equity prices. This paper explores the investment financing behaviour of Gambian banks based on the following assumptions:

i. That the disclosure requirements imposed on banks are sufficient to adequately inform investment decisions, irrespective of the absence of a capital market;
ii. That the free market principles under which the banking system operates, including the free determination of prices accords issuers (firms) the latitude to freely interact with investors;

[2] Informal trade here refers to private placement of shares under situations without formal trading rules, no formal processes for price discovery, etc as would otherwise be present in capital markets.

iii. That even under conditions of a capital market environment, it is the same firm level disclosures that informs investors;

iv. Finally, that it is better to explore firms under conditions without capital markets and contribute to knowledge than ignore such countries.

These assumptions should not be misconstrued as sanctioning disorganized markets, but mere acknowledgement of the pending establishment of a capital market in The Gambia, and the already existing informal equity market through private placements. To reiterate, the Gambian financial system operates under free market principles and is relatively small, with information easily accessible by economic agents. This matters to this study as both issuers and investors deserve to be well informed about available options in any market place. Needless to note, information asymmetry is more pronounced in markets without formal arrangements. That notwithstanding, it is justified to explore Gambian banks' possible observance of the pecking order theory, in particular how they source investment finance.

The majority of Gambian banks are small institutions by international standards, with parent companies from within the West African sub-region. Frank and Goyal (2003) advanced the argument that the pecking order theory is more relevant for large firms, as smaller institutions suffer from high asymmetric information problems. This may sound discouraging to this study for two main reasons; the number of small banks in the country and the lack of a capital market to address the information asymmetry problem. However, Byoun and Rhim (2005), cited in M'ng et al (2017), submit a counter argument that the pecking order theory is relevant for small and non-dividend paying firms, due to the challenges they face in accessing external financing. This study leverages on the conclusions by Byoun and Rhim (2005), given the small size of the banking industry with some institutions not paying dividends often. The challenge of accessing external markets may have been compounded by the absence of a capital market. It is critical therefore that the literature is enhanced with knowledge on possible linkages between capital structure and investment decisions in an environment without a capital market. Finally, unless small and developing markets like The Gambia are explored and understood in this manner, their development may remain elusive.

2. Background

Capital structure refers to the composition of financing options used by firms, either through external financing (issuance of debt or equity), or through organic growth from profitability.

Awan and Amin (2014) observed that there are two schools of thought on the capital structure of firms. First is due to the pioneering work of Modigliani and Miller (1958), which advanced the theory that firm value is independent of its capital structure, thus the latter is irrelevant in influencing firm valuation. The second school of thought proposes that the value of a firm is affected by its capital structure. The contentious argument is whether or not, the securities issued by firms can affect their productive capacity, and therefore shareholder value.

Shahar et al (2015) observed that the literature is replete with capital structure theories, although the most influential are the static trade-off and the pecking order theories. Danso and Adomako (2014) further noted that both of these influential theories were actually inspired by Modigliana and Miller's (1958) pioneering work on the "irrelevance theory". The irrelevance theory is of the assumption that firms seek financing based on a given order of prioritization, with equity and debt freely substitutable. The theory contends that under conditions of perfect capital market, the capital structure is not relevant in determining firm value (market capitalization), as cost of capital depends largely on borrowing rates. Consequently, the theory considers both the capital structure and financing decisions as irrelevant in enhancing shareholder value. This irrelevance is here interpreted to mean the absence of an optimal capital structure for a firm. For instance, H and Cladia (2017) found that it is very difficult to identify if there is an optimal capital structure in order to impact company profitability. However, the challenge of identification of an optimal capital structure does not negate the necessity for management's decisions on the subject. Management's attempt at enhancing shareholder value manifests through satisfying appropriate borrowing requirements, through the issuance of a combination of instruments, etc. The choice of appropriate combination of instruments may depend on internal company strategy, or other internally determined policies.

The capital structure theory attracted much research over the years, resulting in numerous theoretical propositions, most influential of which are the static trade-off theory and the pecking order theory (Danso and Adomako, 2014). Mostafa and Boregowda (2014) took the argument a step further, by observing that the traditional trade-off and pecking order theories are the most widely acceptable theories in corporate finance. The trade-off theory posits that despite the tax benefits accruing from issuance of debt, firms must be careful to balance this with the risks of excessive interest payments on debt exposures, which could carry the risk of bankruptcy. The rest of this study focuses on the pecking order theory.

3.0 Literature review

This section will review theoretical propositions, empirical studies, capital structure of banks in The Gambia

3.1 Theoretical propositions

As Shahar et al (2015) argue, the literature is awash with theories of firm's capital structure, with most of the works inspired by the pioneering contribution of Modigliana and Miller (1958). This study focuses on one of the most influential of these theories, the pecking order theory.

The pecking order theory originated from the work of Donaldson (1961), which was further expanded by Myers (1984), Myers and Majluf (1984). The theory is reputed to have made a significant contribution to the literature, by establishing the linkages between firm's capital structure, dividends and investment decisions. Myers, (1984, 1989, 2001), as cited in Herciu and Ogrean (2017), defined the pecking order theory as implying "firms will borrow, rather than issuing equity, when internal cash flow is not sufficient to fund capital expenditures……but are willing to sell equity when market overvalues them". This relates to the claim that firms with financing needs first turn to internally generated funds (retained earnings), before any other sources of funds. The reason is obvious, it is cheaper (interest or dividend free), thus better and probably the preferred source of new investment financing. It is intuitive that external financing will always be required, as internal funds are often inadequate. In which case, the pecking order theory contends that the second most preferred financing option is debt issuance, with equity at the bottom of the pecking order. In reality, some firms may not have internal funds nor the credibility to attract lenders or investors, thus leaving equity as the only available instrument. Besides, capital markets exist primarily for the listing of firms and issuance of equity as sources of long-term financing.

Proponents of the pecking order theory justify it by arguing that due to the costs of funds, firms would rather source financing internally to avoid interest payments on debt, or dividend payments on equity. In this view, debt is considered to have an edge over equity, due to tax benefits. Further, more equity dilutes ownership, and may require the commitment of more funds to dividend payments in support of a key market indicator (dividend per share). Investors are very particular about dividends per share, with more equity translating to more dividend

payments, possibly in absolute and relative terms. Jibran et al (2012) note that the predictions of the pecking order theory are that firms' capital structure formulation depends firstly on organic growth (revenue generated from operations), followed by debt issuance, and bottom of the pecking order is equity. The strong form of the theory contends that the issuance of equity may never occur at all in some cases, due to the high annual costs of dividend payments. In the real world however, proponents of this theory will struggle to prove it validity due to the excessive usage of equity financing in all markets, including non-listed firms accessing equity financing through private placements. Others have explored the issue of capital structure and its relevant theories through empirical studies, and came up with interesting results as explored in the next part.

3.2 Empirical studies

Saumitra (2012) explored the pecking order theory in a study of 556 manufacturing firms in India, and found strong evidence in support of the theory. The conclusion from this work was that if the theory holds, there must be a link between the capital structure of firms, their dividend payments, as well as investment policies. This is in reference to the relationship between the mix of sources of funds (equity, bonds, loans and other forms of exposures), which eventually determine if firms are obligated to investors in the forms of dividends, interest payments or other costs of funds.

M'ng et al (2017) tested the determinants of capital structure in Malaysia, Singapore and Thailand. The variables employed in the study included profitability, firm size, net tangible assets, depreciation and macroeconomic factors like inflation, which were identified from the review of previous studies on the subject. The study was based in three ASEAN countries of Malaysia, Singapore and Thailand. They conclude that their work contributed to the literature regarding the importance of some firm specific factors in the determination of capital structure. The study effectively sought evidence of cross-country capital structure and the financing decisions in these countries. The findings were varied across the three countries, although summed up as determinants of capital structure said to include firm-specific factors like profitability, size, tangibility of assets and depreciation, etc. In earlier works on advanced economies, Frank and Goyal (2009), explored the capital structure theories among USA firms and concluded that while scholars remain divided over a unifying theory, empirical studies point to firm-specific variables such as profitability, firm size, tangibility of assets and expected

inflation which is the sole macroeconomic variable, are the core factors that influence capital structure in the US.

Horan (2014) explored property firms in Malaysia on possible practice of a target capital structure and its determinants, plus the speed of adjustment over to the target leverage. The results show evidence of target capital structure by property firms, which was said to be impacted by firm specific factors, such as non-debt tax shield, asset structure, profitability, firm size, growth opportunity and liquidity. In short, there was evidence of validity of the pecking order theory of some sought, although the results are at best inconclusive. While some found evidence of validity of the theory (Horan (2014), Frank and Goyal (2000), Saumitra (2012), others M'ng et al (2017) had mixed results across the three countries of study. The next part explores the capital structure of banks in the country.

3.3 Capital structure of banks in The Gambia

The list of components of the balance sheet in Table 2 are as prescribed by the regulatory authority (Central Bank of The Gambia (CBG)) for implementation by banking institutions as the authorized components of capital. Other things being equal, the capital structure evidences permissible sources of financing for banks as listed in Table 2. A comparison between the Gambian approach and the capital structure found elsewhere, as presented by Reynolds and Hepinstall, in Strumeyer (2017), revealed slight differences. The Gambian model excludes general reserves and other undisclosed reserves from capital and reserves. The Gambian model also recognizes only 50 percent of revaluation reserves as qualified Tier 2 capital. These minor differences aside, capital has generally gained universal recognition as the difference between assets and liabilities. Reynolds and Hepinstall, in Strumeyer (2017) argue that capital is virtually the equity or difference between assets and liabilities in a bank's balance sheet, which serves as the cushion to absorb losses incurred by institutions.

Table 1 : Components of capital

As per latest CBG Guidelines, 1994, revised over the years.	**As per Reynolds and Hepinstall, in Strumeyer, 2017.**

Equity- Comprises paid up capital (Ordinary and preference shares) **Reserves -** Retained earnings **Bonds-** long-term instruments, including debentures **Preference shares-** **Revaluation reserves –** of which only 50% is qualified as regulatory capital	Core equity capital (common stock) Disclosed reserves/retained earnings Certain forms of nonredeemable, noncumulative preferred stock Evaluation reserves General loan-loss reserves Other undisclosed reserves

Source: **Reynolds and Hepinstall, in Strumeyer, 2017 and CBG Guidelines.**

It is worth noting that regulators categorize components of capital in terms of quality, where Tier 1 components are considered higher value and more permanent[3] in nature. Other sources of capital like preference shares and loans (bonds) are less valued, less permanent and attract interest payments. Part of the qualifying criteria of capital components is permanency, or longevity of maturity period. Ordinary shares far exceed preference shares as regards the permanency criteria. Also, some of the second tier (Tier 2) capital components are not as permanent as Ordinary shares, such as revaluation reserves. For the purpose of this analysis, all components of capital are included in the structure of capital, irrespective of their nature. The main qualifying basis is their recognition by the apex bank as qualified capital. Furthermore, a comparison of the components of capital as prescribed by the supervisory authority (CBG) and the general model reported by Reynolds and Hepinstall, in Strumeyer, 2017, reveals that the CBG excluded two main items, the general reserves and other undisclosed reserves. These do not form part of sources of capital in The Gambian model and hence could not be explored within data from The Gambia. Accordingly, the regulatory capital comprising the components in Table 2 shall form the basis of analysis in this study.

4.0 Research methodology

The pecking order theory is reputed to have made a significant contribution to the literature, by establishing the linkages between firm's capital structure, dividends and investment decisions (Shahar et al, 2015). This study partially follows the work of M'ng et al (2017), who tested the

[3] Holders of Ordinary shares often sell to other investors in the event of exit, rather than withdrawing from the business, to the extent the investment exist indefinitely.

determinants of capital structure in Malaysia, Singapore and Thailand, with varied results across the countries. This study focuses on one country (The Gambia), and like M'ng et al (2017), it uses panel data regression model and incorporates data on both cross-sectional and time series dimension. Appropriate variables have been carefully selected to construct an unbalanced[4] panel data of twelve banks, for the period 2005 - 2018. It comprises data from published financial statements of commercial banks. The dependent variables representing investments (Treasury Bills and Loans and Advances) are tested for their association with the independent variables, namely profitability, firm size, leverage, etc. The M'ng et al (2017) model is adapted here as follows:

Investment = α_0 ++$\beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$, …… $\beta_n x_{n.....} u$ **(Eq.3.2)**

where **Investment** = The two dependent variables (Treasury Bills or Loans and advances);

α = constant, β_1 to β_n = coefficient of ex-planatory variables;

$\boldsymbol{X}_1$ - $\boldsymbol{X}_n$ are the independent variables, and $\boldsymbol{u}$ is the error term.

4.1 Description of variables

Where necessary, the variables are transformed into natural logarithms to facilitate combination of same within the same model with ratios such as foreign currency exchange rate and inflation rate.

(a) Dependent variables

Saumitra (2012) concluded that if the pecking order theory holds, there must be a link between the capital structure of firms, their dividend payments, as well as investment policies. Drawing from this conclusion, the dependent variables in this study are the two main investment portfolios of banks, aimed at identifying possible links with sources of finance as per the pecking order theory. These are the treasury bills and the loans and advances portfolios, herein tested for association with the determinants.

i. Treasury Bills portfolio (LogTB)

The treasury bills portfolio is one of the main investment portfolios of commercial banks in the country. In line with the predictions of the packing order hypothesis, the investment variables assist in determining association with sources of financing by banks in The Gambia.

[4] The unbalanced panel data is warranted in dealing with identified data gaps in some of the institutions' time series.

ii. Loans and advances (LogLON)

The loan portfolio is traditionally the most important investment component found in the balance sheet of banks, by virtue of their role as financial intermediaries. This variable was not of interest to M'ng et al (2017) but has been added to this study as one of the dependent variables.

(b) Selected independent variables from the literature

i. Profitability (ROABT)

This measure of profitability was employed by M'ng et al (2017), and is the return on assets before tax (ROABT). It is one of the main contributors to retained earnings and is one of the variables of interest. The variable helps in determining possible association between investments financing and profitability (internally generated funds).

ii. Profit after tax (ROAAT)

This variable is defined as the return on assets before tax (ROABT). Although it was not tested by M'ng et al (2017), it is nonetheless added here to control for tax on firms' investment decisions. For instance, the trade-off theory argues that despite the tax benefits accruing from the issuance of debt, firms must be careful to balance this with the risks of excessive interest payments on debts (Mostafa and Boregowda (2014). Tax may therefore impact on the capital structure of banks as tested in this model. It is perhaps a more precise estimator of actual retained earnings after providing for tax and helps in determining association with investment as a source of financing.

iii. Liquidity (LogLIQ)

Liquidity is one of the most important factors which facilitates banks' intermediation process. It is liquid funds which are invested in the lending business, or in treasury bills portfolio, and was tested by M'ng et al (2017). The variable is one of those transformed to natural logarithm for convenience only, and is used to test association with the investment portfolios.

iv. Size of institution (SIZE)

Bank size, measured here as the natural logarithm of total assets was tested by M'ng et al (2017). The variable is expected to have a positive relationship with investments, as bigger institutions may have more resources for investment.

v. Net Tangible assets and Depreciation

M'ng et al (2017) studied entities which did not include banks and found interest in their tangible assets as well as depreciation. This study focuses on banking institutions and does not consider tangible assets nor their depreciation useful variables in this study. Most banks would rather operate in rented offices than purchase their own properties, thus the decision to exclude the variables, as could be misleading and inconsistent across institutions.

vi. Non-Performing Loans (LogNPL)

Non-performing loans represent assets that no longer earn revenue due to the suspension of interest on them. They could threaten the liquidity position of banks if significant, thus the interest in testing for association with investments as in M'ng et al (2017).

vii. Equity financing (Log EQUITY)

As in M'ng et al (2017), equity here refers to the tier one capital and reserves. It is used here as an estimator of the ordinary shares issued by the firms and indeed one of the sources of financing for investments.

viii. Leverage ratio (LEVRATIO)

This variable is measured as the ratio of debt divided by a combination of debt plus equity (M'ng et al, 2017). It estimates the contribution of debt to the financing of the institution's activities relative to the amount of financing received from both debt and equity combined. However, due to the lack of time series data on debt issuance by Gambian banks, deposits are used as proxy for debt financing in this analysis, and computed accordingly. On the other hand, deposits are a major financing component for banks but are not long-term in nature. Their use as proxy for debt is for convenience only.

ix. Inflation rate (INFRTE)

The inflation rate is one of the macroeconomic variables included by M'ng et al (2017) to control for the general economic performance and its impact on the firm.

(c) Additional independent variables

The following variables were added to enhance the literature on the determinants of liquidity in an environment without a capital market.

x. Gross National Income per capita (GNIPCAP)

This variable was added to further control for the general performance of the economy. It is designed to represent the real sector of the economy, and in the process capture the contribution of all nationals. This is considered by the author to be most relevant to The Gambia as nationals of that country in the diaspora do contribute immensely to the country's development.

xi. Dollar exchange rate to the local currency (Dalasi)

The USA Dollar is the most utilized currency for the importation of goods into the country. As an important dependent economy, the author proposed to explore the role of foreign currency exchange rates in determining investment decisions, as the effect of exchange.

5.0 Data Analysis

In line with the variables discussed under the Methodology and partially informed by the literature review, the following hypotheses are tested as means of investigating association between dependent variables and the determinants in this study:

1. H_o: Bank size has a positive relationship with investments- this implies the larger an institution the higher the chances of investment;
2. $H_{o:}$ Foreign currency (USA Dollar) exchange rate has a positive influence on investments; as depreciation of local currency may result in increased foreign direct investments (FDI) due to exchange gains;
3. H_o: Profitability has a positive influence on investment- This relates to the possibility of higher profits being used to support investments by firms.
4. H_o: Leverage has a positive influence on investment- more debt exposure may result in increased funds for additional investments;

5. H_o: Equity has a positive relationship with investment- Higher equity contributes more funds for investment.

5.1 Descriptive statistics

There are twelve commercial banks in The Gambia, although most are fairly young institutions with a very short history of operation in the country. Some were established in the country in the late 1980s. Cognizant of this reality, the author decided to collect data for the period 2005 – 2018, to facilitate a 12-bank analysis and using an unbalanced data panel, resulting in 151 observations. The unbalanced panel data was due to some missing data in some banks, particularly going back a few years.

Table 3 shows the common statistics[5] of all variables in this analysis, of which those transformed to natural logarithms include SIZE, Treasury Bills, Non-performing loans and liquid assets. Among these, the natural logarithm of SIZE (total assets) is the highest, with a Mean of 6.12, being the total balance sheet items and varied within the range of 24.3. This is followed by the mean natural logarithm of liquid assets at 5.76, and varied within the range of 35.92. The lowest mean natural logarithm was reported by non-performing loans at 4.36 and varied within the range of 43.58. The results are consistent with the expectations of the author, as non-performing loans are expected to be generally lower than most other components of the balance sheet, while the total balance sheet is expected to the highest amount, here serving as the measure of firm size.

The exchange rate between the USA Dollar and the local currency (DOLXCR), reports a mean of 35.84. The currency experienced depreciation over the years, with the official exchange rate as at December 2018, reported to be 49.48, well above the mean. However, the depreciation may impact positively on investments from the perspective of inflow of foreign direct investments. For instance, Gambians in the diaspora are often expected to repatriate more funds in support of their families and in some cases for investments when the currency depreciates. The motivation is the exchange gains accruing from the repatriation of foreign currency. On the other hand, currency depreciation could also have an inverse relationship with local investments, given the inflationary tendencies of a fall in the value of the currency.

[5] Details of common statistics are in Appendix A

The mean return of profit before tax (ROABT) amounted to 2.2 and represents a fairly high level of profitability over the years. However, this may mask differences in performance between institutions, as larger banks tend to report higher levels of profitability, while some smaller ones actually reported losses in some periods. Overall, the industry has been profitable over the years, a factor often cited as the main reason for the new-entrants into the industry during the 1980s. The Return on Assets after tax (ROAAT), as expected, reports a mean of 1.21, lower than the mean profit before tax of 2.2. This outcome is consistent with normal expectations.

The mean natural logarithms of the dependent variables, namely Treasury Bills and Loans are by coincidence reported at 5.46 and 5.43, and varied at the ranges of 46.50 and 27.80 respectively. Both are the main investible portfolios in the country, with Treasury bills often the most dominant as shown here, with a marginally higher mean but a far wider range of variability.

Another critical aspect of the descriptive statistics is the kurtosis reported by each of the variables. While most of the kurtosis are below the threshold of 3, a few were above. Those below the threshold of 3 are the variables with distributions having a lower and broader central peak, and the tails are shorter and thinner than the normal distribution. Those with kurtosis above the threshold of 3 have outliers, with wider and fatter tails than the normal distribution. These include the profitability variables of ROABT with a kurtosis of 3.7, ROAAT with a kurtosis of 4.14, and finally the inflation variable with a kurtosis of 3.23.

Table 2: Summary of common statistics of all variables

Variable	Mean	Maximum	Minimum	Kurtosis
Return on Assets before tax (ROABT)	2.25	13.39	-7.86	3.76
Return on assets after tax (ROAAT)	1.22	11.10	-8.42	4.14
Treasury bills (LogTB)	5.46	6.43	4.17	2.10
Firm size (LogSIZE)	6.12	6.96	5.13	2.14
Non-performingloans (Log NPLs)	4.36	5.34	3.02	2.38
Loans (LogLON)	5.43	6.16	3.92	3.32
Liquidity (LogLIQ)	5.76	6.71	3.97	2.97
Equity (LogEQUITY)	5.32	5.98	4.35	2.78
Leverage (LEVERAGE)	0.76	0.93	0.44	2.69
Inflation rate (INFRTE)	5.53	8.03	2.05	3.23

GNI Per capita (GNIPCAP)	716.02	890.00	520.00	2.48
Dollar exchange rate (DOLXCR)	35.84	49.48	22.54	1.59

5.2 Correlation analysis

Further test of the data was carried out to determine the extent of correlation between the variables and suitability for OLS regression analysis. Correlation significance is assessed here at 95 percent confidence interval, with the 151 observations in the sample, the degrees of freedom amount to 149 (151 – 2 = 149), which is closer to the critical value of 0.159. Thus, correlation coefficients above 0.159, or below -0.159 are significant and the relevant variables are considered suitable for OLS analysis. On the other hand, variables with excessively high correlation could cause issues in the estimation of equations.

Table 3 below shows correlations with the dependent variables. Furthermore, details of correlations in Appendix C show that most variables reported significant correlations[6], with coefficients above 0.159 or below -0.159. The correlation coefficients are generally low, which is interpreted as the absence of multicollinearity that may otherwise pose challenges when estimating the OLS regressions equation. The two measures of profitability (ROABT and ROAAT) as shown in Appendix C with a correlation coefficient of 0.975, are significantly and highly correlated and the latter will be excluded from the model to prevent multicollinearity.

Other variables with exceptional correlations are the macroeconomic variables of inflation, Gross National Income per capita and the Dollar exchange rate, given their lower correlations with the loans portfolio. However, all independent variables had significant correlations with at least one of the dependent variables. For this reason, the regression model will be tested with all variables, but the macroeconomic variables exhibiting low levels of correlation will be dropped eventually to determine the impact of their exclusion from the model. These and the rest of the independent variables will be tested using the OLS regression model.

Table 3: Bivariate correlations between dependent and independent variables.

Independent variable	Treasury Bills	Loans
Return on Assets before tax (ROABT)	0.475**	0.392**
Return on assets after tax (ROAAT)	0.477**	0.392**
Firm size (LogSIZE)	0.807**	0.743**
Non-performing loans (LogNPLs)	-0.119	0.557**
Liquidity (LogLIQ)	0.862**	0.504**
Equity (LogEQUITY)	0.755**	0.476**
Leverage (LEVERAGE)	0.376**	0.638**
Inflation rate (INFRTE)	0.370**	0.030
GNI Per capita (GNIPCAP)	-0.202**	0.069
Dollar exchange rate (DOLXCR)	0.403**	0.065

5.3 Inferential statistics

Frank and Goyal (2009) contend that although there is as yet, no globally agreed theoretical explanation of the capital structure of firms, empirical studies have concluded that firm-specific variables are the key determinants. These include profitability, firm size, tangibility of assets and expected inflation which is the sole macroeconomic variable. This study addresses the issue of capital structure indirectly, by focusing on sources of financing for investments. It is anticipated that the results of this test may bear resemblance to the findings by M'ng et al (2017), Frank and Goyal (2009).

In testing the determinants of Investment (Treasury Bills and Loans and Advances), data characteristics are first verified using the Augmented Dickey-Fuller Unit root test. Based on the criteria of 95 percent confidence interval, with a critical value $\alpha = 2.88$, Table 4 below shows that most of the variables are stationary at level , with t-statistics below the critical value.

Table 4: Augmented Dickey-Fuller Unit root test

Variable	T- statistic	P- Value
Natural logarithm of Treasury Bills (LogTB)	-1.0459	0.7357
Natural logarithm of Loans and advances (LogLON)	-2.2906	0.1764

Natural logarithm of total assets (SIZE)	-1.7167	0.4208
Natural logarithm of non-performing loans (LonNPL)	-3.4594	0.0105
Natural logarithm of liquid assets (LogLIQ)	-0.7425	0.8315
Natural logarithm of equity (LogEQUITY)	-1.2331	0.6592
Return on Assets before tax (ROABT)	-2.2781	0.1805
Return on Assets after tax (ROAAT)	-2.1945	0.2092
Leverage ratio (LEVRAT)	-3.4177	0.0118
Inflation rate (INFRTE)	-3.0640	0.0316
Gross National Income per capita (GNIPCAP)	-10.5617	0.0000
Foreign currency exchange rate of Dollar to Dalasi (DOLXCR)	-2.0754	0.255

Nonetheless, some variables, including the macroeconomic variables like Gross national income per capita and inflation rate have t-statistics above the 2.88 threshold. This study concludes that such results are not unusual in time series analysis and the overall data quality is suitable for OLS, given the significant correlations discussed earlier and the majority of variables proving to be stationary, with kurtosis below the threshold of 3.

5.4 Regression analysis

The regression analysis here focuses on the determinants of the two main estimators of investment (Treasury bills and Loans and advances). Empirical findings are compared against expectations as contained in the sets of hypotheses.

(a) Regression results with Treasury Bills (LogTB) as estimator of Investment.

After testing a series of combinations of independent variables for association with Investment, estimated as natural logarithm of Treasury Bills (LogTB), the model in Table 6 emerged as the best in terms of individual and collective influence by the independent variable. The variables dropped included Inflation, profit after tax and Gross national income per capita, partly due to low correlation coefficients in Table 4, lack of stationarity in Table 5, and poor performance in the regression model. The OLS regression results show that with the adjusted R^2 at 80.8 percent, the model has fitted well and the selected independent variables have significant influence on investment, as can explain more than 80 percent of the variability of the dependent variable.

The p-value of the F-Statistic is also well below the 5 percent threshold, which indicates that the independent variables jointly have significant influence on investment. The robustness test of the model is based on the Durbin-Watson statistic, which at 1.83 is close to 2 and there may be evidence of a lack of auto correlation. The Breusch-Godfrey serial correlation LM test confirms the absence of serial correlation as follows:

Obs*R-squared	2.756555	Prob. Chi-Square (2)	0.2520

The test is based on the null hypothesis that there is no serial correlation, with a critical value of 5 percent. The results reveal that with the observed LM statistic at 2.75 and the p-value of Chi-Square at 25.2 percent, which is higher than the 5 percent threshold, the null hypothesis cannot be rejected as the model is homoscedastic.

Table 5: Regression results with Treasury Bills (LogTB) as estimator of Investment

Dependent Variable: LOGTB
Method: Least Squares
Date: 04/02/20 Time: 15:36
Sample: 1 151
Included observations: 151

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.181034	0.450422	-2.622061	0.0097
DOLXCR	-0.005828	0.003387	-1.720776	0.0875
LEVRAT	0.691080	0.335172	2.061867	0.0410
LOGEQUITY	0.790410	0.182559	4.329611	0.0000
LOGLIQ	0.515908	0.089562	5.760373	0.0000
LOGNPL	-0.177162	0.041908	-4.227452	0.0000
LOGSIZE	-0.019293	0.164186	-0.117505	0.9066
ROABT	0.016761	0.006020	2.784220	0.0061
R-squared	0.817424	Mean dependent var		5.466022

Adjusted R-squared	0.808487	S.D. dependent var	0.556801
S.E. of regression	0.243668	Akaike info criterion	0.065507
Sum squared resid	8.490518	Schwarz criterion	0.225363
Log likelihood	3.054185	Hannan-Quinn criter.	0.130449
F-statistic	91.46246	Durbin-Watson stat	1.836890
Prob(F-statistic)	0.000000		

Source: Computed by authors

The p-statistics in Table 6 report five independent variables with significant influence on investment, and they include non-performing loans (LogNPL), leverage ratio (LEVRAT), liquid assets (LogLIQ), Equity (LogEQUITY) and profitability (ROABT). For instance, with a coefficient of -0.177, a 1 percent increase in non-performing loans is likely to result to a decrease in investments by 17.7 percent. The relevant formula is represented in Equation 2:

$$LOGTB = \alpha - \beta_1*LOGNPL + \beta_2*LEVRAT + \beta_3*LOGEQUITY + \beta_4*LOGLIQ + \beta_5*ROABT + U \quad \textbf{EQ (2)}$$

The formula is reproduced with substituted coefficients in Equation 3.

$$LogTB=-1.181-0.177*LOGNPL+0.691*LEVRAT+0.790*LOGEQUITY+0.515*LOGLIQ +0.016*ROABT \quad \textbf{EQ(3)}$$

Table 6 below shows that the relationship of two of the variables (Dollar exchange rate and bank size) did not match expectation, with each reporting negative relationship instead of positive. The null hypothesis of each of these variables is rejected, that there is a positive relationship between them an investment, while the remaining three hypotheses cannot be rejected. The variables with rejected null hypothesis also reported non-significant influence over the dependent variable as shown in Table 5. The rest of the variables were in line with expectations and are significant determinants of investment. For instance, with a coefficient of 0.515, a 1 percent increase in liquidity will result in a 51.5 percent increase in investments.

Table 6: Results of hypothesis: Investment (LOGTB) and independent variables		
Independent variable	**Expected relationship**	**Actual relationship**
Bank SIZE	Positive	Negative
Dollar exchange rate	Positive	Negative
Profitability	Positive	Positive
Leverage	Positive	Positive
Equity	Positive	Positive

Going by the strength of the p-values in Table 5, banks in The Gambia seem to prefer equity financing compared to borrowing funds to finance expansion (investments), with a p-value of 0.00 percent, followed by profitability with a p-value of 0.6 percent, and finally leverage with a p-value of 4.1 percent. Without drawing any conclusions, the next part test another estimator of investment, namely the loans and advances portfolio.

(b) Regression results with Loans and advances (LogLON) as estimator of Investment.

After testing a series of combinations of independent variables for association with Investment, estimated as natural logarithm of loans and advances (LOGLON), the model in Table 7 emerged as the best in terms of individual and collective influence by the independent variables. Once again, the variables excluded were inflation and Gross national income per capita, partly due to low correlation coefficients in Table 3, lack of stationarity in Table 4, and poor performance in the regression model. The results show that with the adjusted R^2 at 81.2 percent, the model has fitted well and the selected independent variables have significant influence on investment. The independent variables can explain more than 80 percent of the variability of the dependent variable.

The p-value of the F-Statistic is also well below the 5 percent threshold, which is interpreted as independent variables jointly having significant influence on investment. Assessment of the

quality of the model is based on the Durbin-Watson statistic, which at 1.91 is close to 2 and there may be no auto correlation in the model. The Breusch-Godfrey serial correlation LM test confirmed the absence of serial correlation as follows:

Obs*R-squared	0.277011	Prob. Chi-Square (2)	0.8707

The test is based on the null hypothesis that there is zero serial correlation in the model, with a critical value of 5 percent. The results show that with the observed R-Squared statistic at 2.77 and the p-value of Chi-Square at 87.07 percent, which is higher than 5 percent, the null hypothesis cannot be rejected. This represents an absence of serial correlation.

Table 7: Regression results with Loans and advances (LOGLON) as estimator of Investment

Dependent Variable: LOGLON

Method: Least Squares

Date: 04/02/20 Time: 17:15

Sample: 1 151

Included observations: 151

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.933150	0.345040	-2.704469	0.0077
DOLXCR	-0.004131	0.002594	-1.592421	0.1135
LEVRAT	1.159267	0.256754	4.515091	0.0000
LOGEQUITY	0.349581	0.139847	2.499737	0.0136
LOGLIQ	-0.223477	0.068607	-3.257330	0.0014
LOGNPL	0.292260	0.032103	9.103894	0.0000
LOGSIZE	0.618189	0.125772	4.915138	0.0000
ROABT	-0.003026	0.004612	-0.656087	0.5128

R-squared	0.820820	Mean dependent var	5.432903
Adjusted R-squared	0.812049	S.D. dependent var	0.430553
S.E. of regression	0.186659	Akaike info criterion	-0.467543
Sum squared resid	4.982341	Schwarz criterion	-0.307687
Log likelihood	43.29947	Hannan-Quinn criter.	-0.402601
F-statistic	93.58307	Durbin-Watson stat	1.909710
Prob(F-statistic)	0.000000		

Source: Computed by authors

The p-values in Table 7 above also report five independent variables with significant influence on investment, these include non-performing loans (LogNPL), leverage ratio (LEVRAT), liquid assets (LogLIQ), Equity (LogEQUITY) and bank size (SIZE). For instance, bank size is a significant determinant of investment, with a coefficient of o.61. This means a 1 percent increase in bank size is likely to result to a 61 percent increase in investment. In short, larger institutions

are more likely to embark on expansionary investments than smaller institutions. The relevant formula is represented in Equation 4.

$$LOGTB = \alpha - \beta_1*LOGNPL + \beta_2*LEVRAT + \beta_3*LOGEQUITY + \beta_4*LOGLIQ + \beta_5*SIZE + U$$

EQ(4)

The model is reproduced with substituted coefficients in Equation 5.

$$LogTB=-0.9331+0.2922*LOGNPL+1.1592*LEVRAT+0.3495*LOGEQUITY-0.2234*LOGLIQ +0.6181*LOGSIZE$$ **EQ(5)**

In terms of the direction of relationship with the dependent variable in Table 7, all but two of the hypothesis deviated from expectation.

Table 8: Results of hypothesis test: Investment (LOGLON) and independent variables

Independent variable	**Expected relationship**	**Actual relationship**
Bank SIZE	Positive	Positive
Dollar exchange rate	Positive	Negative
Profitability	Positive	Negative
Leverage	Positive	Positive
Equity	Positive	Positive

Table 8 reveals that the relationship of two of the variables (Dollar exchange rate and Profitability) with the dependent variable did not match expectations, with each reporting negative relationship instead of the expected positive. Also, both variables each reported non-significant relationships with the dependent variable as shown in Table 7. The rest of hypothesis went according to expectations and are significant determinants of investment as discussed individually in the next part.

(c) Summary of determinants of investments

The results from the two regression models show the determinants of investment are predominantly firm specific factors, as found by Frank and Goyal (2009). They include non-performing loans, leverage ratio, liquidity, Equity, firm size and profitability. This leaves out external factors such as inflation, foreign currency exchange rate, gross national income, etc. However, more work is required on this subject, such as investigation of the role of government investment promotion policy on investments in the banking sector.

The variable dollar exchange rate was added by the author to determine its impact on investment. Ironically, the variable showed a lack of significance in both models. It was also expected to have a positive relationship with investment as depreciation of the local currency was expected to attract foreign direct investments pursuant to exchange gains. The negative relationship on the other hand suggest that currency depreciation could erode confidence and scare away investors. Another possible explanation is the depreciating currency resulting to imported inflation and having a dampening effect on investments.

Overall, the results of the regression are similar to the findings by M'ng et (2017 and Frank and Goyal (2009) regarding the importance of firm specific factors in determining investments, which in this study indirectly evidences a link with choice of capital structure. The extent of observance of the pecking order theory or not is assessed in the next part.

5.5 Testing observance of the pecking order theory

The pecking order hypothesis postulates that firms would prefer sourcing their finances through retained earnings, followed by debt and finally equity, in that order (Jibran et al, 2012). Myers, (1984, 1989, 2001) cited in Herciu and Ogrean (2017) extended the interpretation of the pecking order theory to imply that firms would rather borrow for their investments rather than issue equity. A test of the extent of observance of this principle by Gambian banks is made through the regression results in Tables 6, where investment is represented by the proxy of Treasury bills, and Table 7, where investment is represented by the proxy of loans and advances. Table 9 presents the regression outcome of the three variables relevant to the pecking order theory, namely profitability, leverage and equity. An attempt is made to rank them in the order of importance as determinants of investments, based on the strength of their p-values. The ranking

is however complicated by the need to consider the results from two regression models, thus the adoption of the simple averaging method. From each of the regression models, the three variables are each ranked from 1, being the strongest determinant, to 3, being the weakest. The total score per variable is divided by 2 to compute a simple average score. The average scores indicate that equity is the strongest determinant of investments with an average score of 1.5, followed by leverage with an average score of 2, and finally profitability with an average score of 2.5. This means there is no evidence of observance of the pecking order theory by banks in the mobilization of long-term financing.

Table 9: Summary of results on the pecking order theory					
Variable	**Results from Table 6**		**Results from Table 8**		**Average Score**
	P-value	**Ranking**	**P-value**	**Ranking**	
Profitability	0.0061	2	0.5128	3	**2.5**
Leverage (Debt)	0.0410	3	0.0000	1	**2**
Equity	0.0000	1	0.0136	2	**1.5**

The above reflects the reality in the country, as banks tend to rely on equity in periods of recapitalization, instead of issuance of debt. Also, a number of institutions sometimes report losses in their operations, which leaves equity as the most reliable source of long-term financing. Finally, the results are inconclusive given the use of deposits as a proxy for long-term debt in the computation of leverage. Bayrakdaroglu, Ege, & Yazici (2013) observed that these theories often point to different or even opposing results when subjected to as in this study.

6. Conclusions

This study explored data from the 12 commercial banks in The Gambia, using descriptive and inferential statistical analysis. The data was a mixture of ratios and absolute numbers, warranting data transformation of the latter into natural logarithms for analytical convenience. The descriptive statistics included common statistics such as means and other measures of central

tendency, as well as kurtosis. The descriptive statistics reveal that the data is consistent with expectations, such as the mean total assets being the largest component of the balance sheet, followed by other items like treasury bills and loans and advances. Most of the variables reported kurtosis below the threshold of 3, while a few had kurtosis marginally above, such as return on assets after tax (ROAAT) at 4.14, although this did not warrant exclusion from analysis. Further scrutiny of the data was performed through correlation analysis, which indicated moderate levels of correlation between the independent variables. A test of significance of correlations at 95 percent confidence interval with 149 degrees of freedom and a critical value of 0.159 revealed that only gross national income per capita and inflation reported less than significant coefficients of correlation. Both variables were subsequently found to have little or no association with investment in the regression model. However, each of the independent variables had a significant correlation with at least one of the dependent variables and are considered generally appropriate for OLS analysis.

The ordinary least square (OLS) regression of an unbalanced data panel of 151 observations, representing 12 banks revealed that firm specific variables are the most significant determinants of investment. The regression model was developed using two dependent variables as proxies for investment (treasury bills and loans and advances). There were similarities in both regression results, with key determinants of investment including profitability, firm size, leverage, equity, liquidity and non-performing loans. In short, firm-specific variables are the most important determinants of investment among banking institutions in The Gambia. Similar findings were registered by M'ng et al (2017) in their study of capital structure of firms. The popularity of equity financing bodes well for the proposed establishment of a capital market in the country. Finally, there was no evidence of observance of the pecking order theory in the sourcing of finance for investments. Jibran et al (2012) note that the predictions of the pecking order theory are that firms' capital structure formulation depends firstly on organic growth (revenue generated from operations), followed by debt issuance, and bottom of the pecking order is equity. While there was no evidence of observance of the pecking order theory by banks, there seems evidence that equity remains a popular means of sourcing finance. This evidences the need for a capital market in the country.

Policy recommendations

- The popularity of equity financing has been established in this study. However, this could also be interpreted as a need for caution not to create a crowding out situation in the new capital market. This is where banks dominate the issuance of equity in the capital market at the disadvantage of the real sector, which is in greater need of long-term financing for infrastructural development.
- Measures may be put in place to encourage alternative sources of long-term financing in the new capital market, including issuance of bonds, debentures and other longer-term instruments in addition to equity.
- The banking industry may be encourage to further augment their capital pursuant to further investments in light of the strong positive association between investments and the two key variables of equity and firm size

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