

# Testing the Pecking Order and Signalling Theories for Financial Institutions in Ghana

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## Abstract

Studies on the nature of capital structure of firms worldwide have focused on its impact on financial performance and its determinants, only few studies have tried to empirically test the theoretical basis of capital structure most especially in Ghana and Africa at large. From this backdrop, this study tested the pecking order theory which is of the view that there is a financing order and the signalling theory which suggests that a financial institution's financing strategy sends diverse signals to potential lenders about the financial dependence. The results indicate that the pecking order and signalling theories are significantly been applied by the financial institutions in Ghana. This conclusion is arrived at after the panel data methodology was employed in the model estimation. The study therefore suggest that in as much as possible financial institutions should conform to the pecking order theory, they should implement policies which would increase their cash flow as it signals to investors that the firms are financially dependent.

**Keywords:** Financial institution, Pecking Order Theory, Signalling Theory, Panel

**JEL:** G3, M00, M1

## 1. Introduction

In the field of finance, studies have been conducted on the on capital structure ever since the optimal capital structure argument started with Modigliani and Miller in 1963. But studies on the theories underpinning capital structure have not been extensively tested on the various sectors and industries of the economy. Among these theories are the pecking order theory and the signalling theory. The pecking order theory according to Myers (1984) is among the most influential theories of corporate leverage simply because of adverse selection, information asymmetry and moral hazard, firms' desire internal to external sources of finance. When outside funds are necessary, firms will opt for debt than equity because of lower information costs associated with debt issues as well as the inability of debt to dilute the control of equity capital. On the other hand, Barclay and Smith (2005) posit that the signalling theory assumes that financing decisions are designed basically to signal managers' confidence in the firm's future prospects to outside investors as well as their financial independence. Even though studies on the theories are limited, empirical evidences on this area are predominately that of the developed economies. The hypothesis of this study was developed from Barry, Bierlen and Sotomayor (2000), whose study tested how the pecking order and partial adjustment theories can be applied to farm businesses. Barry et al (2000) concluded that, farms adjust to strategic financial targets for equity, debt, and leasing, but emphasised that the additional financing needs follow a pecking order that is stronger for farms with greater asymmetric information problems.

From the practice of financial management in financial institutions, the signalling and the pecking order theories are both concerned with relationship between a firm's debt structure and cash flow under asymmetric information, moral hazard and adverse selection. According to Barry, Katchova and Zhao (2004), the signalling theory implies a positive relationship between the firm's cash flow and debt structure, while the pecking order suggests a negative relationship between the firm's cash flow and debt structure. The conclusion by Barry et al (2004) was based on analysing their results with the findings of Sunder and Cornett (2004) whose research tested the theories using a 19 year time frame and found a statistically significant support for the pecking order theory. Taking the argument from the signalling theory perspective, Ravid and Sarig (1991) posit that, firms signal their financial independence by the optimal combination of dividends and debt capital. Their study forecasted that firms which are performing well in terms of their financial performance and are highly leveraged pay higher dividends than those with less debt in their capital structure.

According to the signalling theory, financial institutions and lenders have adverse selection regarding investment prospects. Managers of financial institutions then attempt to pass on to lenders their good expectations of future feat through various signals, which can be higher leverage or accumulated assets. Lenders judge the truth of these signals and then decide to save with such institutions who will intend give them out as loans to their customers. If high leverage can also work as financing signal for financial institutions, financial firms should have a higher leverage level which is connected with contemporaneous investments.

Since the benefits from the investments cannot be realized immediately due to the long term nature, banks as well as insurance companies reap interest on the borrowed loans, the relevant signalling should imply a

positive relationship between financial institutions current leverage and cash flow. On the other hand, the pecking order financing suggests that financial institutions with given investment opportunities in any given period will first rely on available cash flow to meet financing needs in their effort of maintaining optimal capital structure and prevent dilution of control. When financial institutions are faced with high non performing loans which invariably mean their financial performance begins to dwindle, managers of such institutions will prefer utilizing debt financing to issuing equity, which means that, cash flow and leverage should be negatively related.

The objectives of this study are to empirically test whether financial institutions in Ghana follow the signalling and pecking order theories of capital structure. First, the study explores the relationship between leverage and cash flow to ascertain whether the relationship is negative to test its conformity with the pecking order theory. Then determine whether financial institutions follow the signalling theory.

The rest of the paper is organised into a review of literature which summarises the empirical research on the theories which are being tested, this is then followed with the methodology section. This section provides a vivid overview of how the data was collected and the estimation model used in the analysis of the data. Finally the results and discussion section is provided to discuss how the objectives of the study were achieved.

## 2. Review of Literature

This study is focused on testing theories and for that matter the principal theoretical models of financial leverage center on the idea that firms have information that investors do not have, and that the interests of managers, equity-holders and debt-holders may not coincide. The theories have also recognized the benefits of leverage in firm financing while avoiding the costs of financial distress. These recognitions have led to two dominant theoretical models (signalling theory and the pecking order theory) which this study sought to test against the financial institutions in Ghana.

### 2.1 The Pecking Order Theory

From the perspective of Barclay and Smith (2005) the pecking order theory implies that, companies that identify relatively smaller number of investment opportunities and free cash flow will have low debt ratios because the cash will be used to settle the debt. It therefore suggested that blue-chip firms with low operating cash will have high debt ratios because of their reluctance to raise new equity. It should be emphasized that where information asymmetry does not clearly manifests itself, the firm will then turn to debt if additional funds are needed, and eventually issue equity to cover any remaining capital requirements. It is clear at this point that, firms would prefer internal sources to costly external finance not only because of the cost of capital but to prevent the dilution of control of existing equity holders.

Thus, the import of the pecking order theory is that, firms that are profitable and can generate earnings are expected to use less debt capital than those that do not generate high earnings. In support of this Symeou (2008) stated that the reason that companies may choose to maintain spare debt capacity is to maintain their credit rating since it can take several years to recover from a downgrade. Retained internal funding in favour of debt improves the company's ability to withstand a period of poor performance and allows it to execute a recovery plan.

### 2.2 The Signalling Theory

Signaling theory according to Akoto and Gatsi (2010) is a theory which is built on the presumption that managers have superior information than the stakeholders on the activities of the firm, and for that matter managers could increase the leverage component. However, in contrast to market timing, where securities offerings are seen as an attempt to raise "cheap" capital, the signaling model assumes that financing decisions are designed basically to convey managers' confidence in the firm's future prospects to outside investors (Barclay & Smith, 2005). Most often, this is done to raise the value of shares when managers think they are undervalued. Debt mandates firms to make a fixed set of cash payments to debt-holders over the term of the debt security. Firms could be forced into bankruptcy if they default in honoring their debt obligations. Also, bankruptcy is costly to managers as they could lose their jobs.

Managers are not unaware of this and would therefore do everything possible to avoid it in order to maintain their positions, all things being equal. Nonetheless, dividend payments are not obligatory and managers have more judgment over their payments and can reduce or omit them in times of financial difficulty (Barclay and Smith, 2005). For these reasons, adding more debt to the company's capital structure can serve as a credible signal of higher expected future cash flows (Ross, 1977). In this vein, increasing leverage has been suggested as one potentially effective signaling device.

### 2.3 Empirical evidence

There have been various studies which have linked the theories of capital structure to the debt structure of financial institutions. In a study on the nature of insurance companies in Pakistan, Naveed, Ishfaq and Zulfqar

(2010) found that the capital structure of most of the insurance companies follows the pattern of the pecking order theory such that it is only when there are debt facilities that insurance companies will normally opt for equity capital. Their study was based on life insurance companies numbering 17 and using the panel methodology, the results indicate the existence of less equity than debt capital. Their study also found that, the signalling theory hold in the sense that, the performance of the insurance companies signals to the debt provider that they can redeem their debt whenever it is due amounting to the reason why their debt components continue to rise. Even though their study contributed to knowledge, they could not consider the entire financial institutions to test it against the theories of capital structure.

El-Wahid and Singapurwoko (2011) conducted a study by testing theories of capital structure. The researchers opined that, there are several factors that can influence the theories of capital structure. In view of this, their study used operational decision factor, macroeconomics factor, firm size factor, and industry factor to help understand the theories of capital structure. Operational decision factor was used as a proxy to explain how well the companies were able to utilize their debt capital to generate profit. Firm size factor was also a proxy which indicated how companies use their capital to generate profit.

The uniqueness of their research was to add industry factor to compensate the other factors in providing explanations to the theories of capital structure. The result indicated that in uncategorized data, debt, firm size, and operational decision positively affect the choice of capital based on the pecking order theory as well as the free cash flow theory. On the other hand, industry factor is found to negatively affect the choice of debt capital. This implies the defiance of the pecking order theory.

Chang, Chen and Chen (2013), on the issue of how pecking order theory explains capital structure, emphasised that, the pecking order theory of capital structure is one of the most influential theories of corporate finance. For that matter their study was able to explore the most important factors on a firm's capital structure by pecking-order theory. Hierarchical regression was used by the researchers in the analysis. Their study also examined the determinants of debt decisions for 305 Taiwan electronic companies that are quoted on the Taiwan Stock Exchange in 2009.

The results of the study by Chang, Chen and Chen (2013), indicated that the determinants of capital structure are profitability and growth rate. From that backdrop, profitability negatively affects on capital structure. It implies that firms prefer to use their earnings to finance business activities and thus use less debt capital. Growth rate was found to positively affect capital structure. Size is a moderator variable in their study. Size of firms moderates the effects of tax rate on capital structure. Large firms appear to take advantage of the tax deductibility of debt. The findings are important for management and investors.

To narrow the study further to Ghana, Akoto and Gatsi (2010) found that there is a conformity of the capital structure pattern of banks in Ghana to the pecking order theory such that the outcome of the study indicated that, the banks in Ghana are hugely leveraged, implying high reliance on debt capital than equity capital as the theory proposes, but the study could not link the findings to the signalling theory of which this study considers.

Apart from the inability of the researchers to test the signalling theory to the situation, the study could not consider all the financial institutions in Ghana which this study sought to achieve. In their effort to unveil the nature of capital structure of insurance companies in Ghana, Ansong and Asmah (2013), found out that the capital structure of insurance companies in Ghana are made up of debt and equity capital. This conclusion was made after their study used the purposive sampling to select 15 insurance companies from the list of insurance companies who are registered with the National Insurance Commission of Ghana. But again the study was not able to link their findings to the signalling and pecking order theories, hence, this study tests both theories against the capital structure of the financial institutions in Ghana.

### 3. Research Methodology

The empirical analysis utilizes data from the National Insurance Commission and the Bank of Ghana database for the insurance companies and the banks resident in Ghana respectively. To ensure data conformity in terms of number of years for both sectors, a period of eight years, thus data covering 2005 to 2012 was used in the study. The purposive sampling technique was then used to select 26 financial institutions. The 26 institutions were selected because according to Cheng, Chen and Chen (2013), in studies of this nature, complete data set for all the companies is necessary for an inference to be made. In view of this, all companies that had their complete financial statements covering the eight years were selected out of a population of 58 in Ghana. The sampled institutions comprise 13 insurance and 13 banks and the reason is to have a fair representation of each sector in the sample size.

Based on the variables explained the regression equation below is used in the analysis. Because this study is based on time series and cross sectional data from more than one company and for more than one period, Park (2009), suggests that studies of this nature is better estimated using the panel methodology.

$$\text{Lev} = \beta_0 + \beta_1 \text{ROA}_{i,t} + \beta_2 \text{INV}_{i,t} + \beta_3 \text{CF}_{i,t} + \beta_4 \text{AG}_{i,t} + \beta_5 \text{RK}_{i,t} + \epsilon_{i,t} \quad (1)$$

Where:

- Lev Represent leverage of the financial institutions
- ROA Represent returns on asset for firm  $i$  in time  $t$
- INV Represent investment for firm  $i$  in time  $t$
- CF Represent cash flow for firm  $i$  in time  $t$
- AG Represent age for firm  $i$  in time  $t$
- RK Represent risk for firm  $i$  in time  $t$

### 3.1 Measurement of Variables

The measurements of the variables for the study were adopted from the study of Barry, Katchova and Zhao (2004). From this backdrop, the variables used in the study reflected in the following measures:

- a. Cash flow (CF) is the financial institution's total net cash provided by operating activities and investing activities expressed as a percentage of the total cash flow to the entity.
- b. Total leverage (L) is the sum of short term liabilities, intermediate liabilities and long term liabilities. Short-term debt is current liabilities plus intermediate liabilities.
- c. Current liabilities include unpaid premiums, vostro accounts by the banks, short term operating notes, loans, lease payment and accounts payable with merchants & dealers, estimated accrued tax liability, and accrued interest due within twelve months of intermediate and long term notes. Intermediate liabilities are the capital lease/deferred portion of intermediate notes and life insurance policy loans etc. Long term liabilities contain the real estate mortgages and contracts.
- d. Investment (INV) is made up of investment in property plant and equipments, intangible assets as well as investment properties expressed as a percentage of the total asset of the company.
- e. Return on assets (ROA) is measured by the earnings before interest and tax expressed as a ratio of total asset of the financial institutions.
- f. Risk of the financial institution (RK) is measured as the standard deviation of ratio of total claims and interest paid to total premiums and interest received by the financial institutions.
- g. Age of the financial institutions (AG) have been regarded by most researchers as significant because it determines the extent to which a firm which has excess cash flow would still prefer to use debt in its operational activities.

## 4. Results and Discussion

Table 1, presents the results of the descriptive statistics of the variables used for this study. It must be noted that all the variables presented in the table are in percentages with ROA, INV, CF, LEV, AG, and RK representing return on asset, investment ratio, cash flow ratio, leverage ratio, age of the firm and riskiness of the firms respectively. In view of this return on asset which is the variable used as a proxy for the profitability of the financial institutions recorded an average of 16.73% which is far above the reported average ROA of 12% for the financial sector of Ghana by the Ghana Statistical Service for 2012.

The reason for the disparity is that this study used insurance and banking institutions while the one recorded by the Ghana Statistical Service comprised microfinance institutions which were not considered in this study. This result shows that on the average financial institutions in Ghana generate quite a substantial amount of funds which can suffice the financial needs of these institutions. But to draw a concrete conclusion, the average of the cash flows needs to be considered. In view of this the average cash flows for the financial institutions was -14.22% meaning that even though the return on assets signals a better performance of the financial institutions in Ghana, the actual cash that flows to the institutions are negative, meaning that they depend on debt capital in managing their day to day operations.

**Table 1. Descriptive statistic of the variables**

	ROA	INV	LEV	CF	AG	RK
Mean	16.73	16.97	58.56	-14.22	10.25	0.97
Median	26.15	12.94	56.77	13.00	15.68	0.81
Maximum	13.60	45.14	83.61	56.00	88.50	14.34
Minimum	3 4.50	24.23	48.85	-19.00	9.89	0.32
Std. Dev.	21.53	0.99	16.98	27.23	9.02	3.31
Skewness	-1.31	4.07	-2.27	-2.99	-1.81	0.15

Source: Author's estimate, 2013

From this development the average debt which is represented by the leverage of the financial institutions was 58.56% implying that financial institutions in Ghana are highly leveraged, partly because of their inability to generate physical cash to undertake developmental activities. The standard deviation which measures

the extent to which the recorded average can be real indicates that the average for ROA, cash flow and leverage can be the actual situation since the standard deviations were 21.53%, 27.23% and 16.98% respectively.

With regards to the investment of the financial institutions, the means show that the total investment of the companies averaged 16.97%. This implies that the institutions spent 16.78% of their total capital on long term fund generating activities of the institutions. This signals the institutions' willingness to expand their activities in the future. Relating this to the pecking order theory, it can be deduced that the institutions hope to recoup excess funds from the investment activities in order to be financially sufficient in the years to come so that the institutions can depend on their internally generated funds before considering debt capital for managing the company's activities.

The maximum age of the institutions reveals that some of the institutions are more than 80 years but the average for the institutions was 10 years which means that the institutions that were used for the study can provide sufficient data for the pecking order theory and signalling theory to be tested for.

#### 4.1 Correlation matrix

Table 2 reveals the correlation between the variables used for the study. The purpose for this matrix is to establish whether there exists multicollinearity among the variables used for the study. In view of this, most of the relationship is considered to be significant such that the cash flow of the institutions is negatively related to the leverage of the institutions. The import is that as the institutions generate physical cash, they have enough cash at their disposal, hence debt level would decrease and as cash flow decreases the debt level would have to increase since they would have to borrow to manage their operations.

In line with the signalling theory, Table 2 also indicates that, as the financial institutions increase their return on asset they increase their level of investment of the company as well as the riskiness of the firm. The financial institutions would have to save some of the funds in order to be able to settle their debt obligations in the future. But as indicated in Table 1, the profit made by the financial institutions are most often not in cash hence the risk of the institution is likely to increase. This is line with the findings of Akoto and Gatsi (2010) because apart from the fact that both studies are focused on the financial sector of Ghana, the researchers used the same methodology as adopted for this study as well as the time period, but the variables used in the study were different.

**Table 2: Correlation matrix**

	ROA	INV	LEV	CF	AG	RK
ROA	1					
INV	.043*	1				
LEV	.023*	.113*	1			
CF	.039	.123**	-.509	1		
AG	-.07*	.033	.035**	.167	1	
RK	.032**	.202**	-.391	.128	.437**	1

\*. Correlation is significant at the 0.05 level (1-tailed).

Source: Author's estimate, 2013

Finally the age of the financial institutions demonstrate a significant positive relationship with leverage, meaning that as they grow in age their credit worthiness increases and for that matter they are able to obtain enough funds from debt providers with little difficulty. However, because banks are inclusive they attract more customers to deposit with them. But age is inversely related to the return on asset. This implies that as the firms operate for a long time their return on asset reduces due to the decline in the efficiency with which the assets are applied in revenue generating activities. As a result the assets of the firm are not able to effectively yield the results that are expected from them, hence the institutions would have to borrow from external sources to manage their activities. This signals that the firm is financially independent. A similar result was found by Naveed et al (2010) because their study was conducted in a developing economy like Ghana. Also, their study measured most of the variables adopted in this study and the reason is that, as firms increases, they are forced to borrow more and the interest on the borrowed amount in turn decreases their earnings after interest payment which in turn reduces the amount used in the computation of the return on asset.

#### 4.2 Regression Results

To test for causal effect, regression results are used. Table 3 presents the regression results in which the leverage of the financial institutions was used as a dependent variable. From Table 3, the leverage of the financial institutions is negatively related to return on asset of the institutions. The relationship is statistically significant at 5% because of the bench mark alpha 5% which has been used by the researcher for the study. The import of this

is that the profitability of the financial institutions decreases when they increase their leverage position. This is because when leverage increases in the capital structure of the institution, according to Barclay and Smith (2005) the bankruptcy cost and financial risk of the institution also increase leading to an increase in the expected return by equity holder as well as the interest that is charged on debt capital.

**Table3 Regression result**

Variable	Coefficient	t-Statistic	Prob.
C	1.6845	3.7683	0.0005
ROA	-0.2458	-2.6548	0.0211
INV	2,3465	3.1284	0.0027
CF	-3.0014	-2.6529	0.0156
AG	0.4943	2.6211	0.0179
RK	-1.4221	-2.9972	0.0115
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R-squared	0.7623		
Adjusted R-squared	0.6579		
F-statistic	3.2312		
Prob. (F-statistic)	0.0000		

Source: Author's estimate, 2013

The negative relationship between return on asset and leverage means that, interest to be paid by the institution would increase, forcing the earnings after interest payments to reduce, forcing the financial performance of the institutions to decline. Relating the inverse relationship to the signalling theory perspective, the result obtained means that because of the high leverage nature of the financial institutions in Ghana it send signals to loan providers that the institutions are not credit worthy hence increasing the interest components on the borrowed amounts.

From the pecking order theory perspective, as the leverage of institutions increases their cash flow should reduce. This signals that whenever there is insufficient cash flow, firms borrow and therefore it leads to an increase in the debt level of the firms. This implies that if the pecking order theory should hold, the cash flow of the financial institutions should have a negative relationship with the leverage of the financial institutions used for this study. From Table 3, this assertion holds because there exists a negative relationship between leverage and cash flow and this is significant with a p-value of 0.0156. The import of this is that the pecking order theory is being practice in the management of the capital structure of financial institutions in Ghana. This outcome is in consonance with the findings of Symeon (2008) and Ansong and Asmah (2013) simply because of the similar settings both studies were conducted as well as the methodology which were employed by both studies.

In relation to the age and riskiness of the institutions, a recorded alpha of 0.0179 and 0.0115 is sufficient to establish a positive and negative relationship respectively with the leverage of the institutions such that when firms become more risky they reduce the reliance on debt capital as suggested by Ross, (1977). Again the relationship between the age of the firm and the leverage confirms the findings of Naveed et al (2010) because they posit that age is a determinant of the leverage of insurance companies and it has been found to be a positive determinant of the leverage of financial institutions in Ghana.

The level at which the variables used in the study explains the dependent variable is 65.79% according to the adjusted R-squared. This signals that the variables for the study are appropriate just as the F- statistic confirms all the variables being significant.

### 5. Conclusions and Suggestions

The results of this study indicate that the pecking order theory and signalling theory are significantly being applied by the financial institutions in Ghana. This conclusion is arrived at after the panel data methodology was employed to analysis the data used for the studies. However, unlike corporate firms which usually use low leverage as a signal to attract potential investors, financial institutions prefer to use more debt capital in their operational activities with larger investment capacity, low cash flows as well as increase in their age. The study therefore suggest that in as much as financial institutions should conform to the pecking order theory, they should implement policies which would increase their cash flow as it signals to investors that the firms are financially independent.

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