AN INVESTIGATION OF THE CAPITAL STRUCTURE POLICY OF EGYPTIAN BANKING SECTOR FIRMS

Sherine Abdul All
Associate Professor of Accounting,
College of Business Administration,
Abu Dhabi University, Abu Dhabi, UAE

Sanjoy Bose
Professor of Finance and Accounting,
College of Business Administration,
Abu Dhabi University, Abu Dhabi, UAE

Iliya Komarev
Assistant Professor of Accounting
College of Business Administration,
Abu Dhabi University, Abu Dhabi, UAE

Key Words: capital structure, banks, panel data, Egypt

JEL Classifications: G21, G32, C33

Abstract

This research examines the relationship between capital structure and three of its major determinants proposed in the prior literature - profitability, growth rate and size. Our sample includes data for all banks listed in Kompass Egypt, in the period 1995-2007. We utilize panel data regression analysis and show that the total debt ratio is negatively affected by both the bank's return on assets and its earnings growth rate. However, in contrast with the prior literature, the size of the

Egyptian banks (measured by total assets) is a weak predictor of their capital structure. Interestingly, only 10% to 20% of the total debt ratio variances are explained by profitability and growth rate, the rest being due to company-related and stable in time idiosyncrasies. Our results differ when we attempt to explain short-term and long-term debt with the same determinants.

1. INTRODUCTION

Financial decisions regarding capital structure appear to be underpinned by quite complex processes. The existing theories and propositions can explain only certain factors underlying the diverse and complex corporate financing practices (Pecking Order Theory - Donaldson (1961), Myers (1984), Myers and Majluf (1984); Shareholder Theory - Berle and Means (1932), Friedman (1962); Trade-off Theory - Scott (1976), Copeland and Weston (1988), Kraus and Litzenberger (1973), Kim (1978), Harris and Raviv (1991), Attaoui and Poncet (2013); Agency Cost Theory - Jensen and Meckling (1976), Morellec et al. (2012); and Modigliani and Miller (1958) propositions I and II). The capital structure decision is particularly crucial given the effects it has on the value and the governance of the firm.

This paper tries to establish a relationship between the firm's capital structure decision and a set of variables deemed to affect such financial decisions. The study examines 20 Egyptian banking firms listed on the Egyptian Stock Exchange. According to Martin and Scott (1974), firms must consider eight factors when making capital structure decisions. These factors are: (1) leverage, (2) liquidity, (3) profitability, (4) dividends, (5) market price, (6) firm size, (7) sales growth and (8) sales variability. This research concentrates on the effects of the profitability ratio, growth rate and firm size on the capital structure decision.

The analysis of the variables that tend to affect the firm's capital structure decision is vital for several reasons. First, although the identification of determinants of the firm's capital structure and the question of whether an optimal capital structure exist have attracted considerable amount of effort, the extant research in the field has not yet provided clear answers. Second, testing the existing capital structure theories in a different and yet unexplored context, like the Egyptian banking sector, would bring additional arguments about the robustness of those theories.

For instance, theories such as Modigliani and Miller, the Pecking Order Theory and the Trade-off Theory provide contradictory explanations on both the determinants of capital structure decisions and the role that the capital structure has on the firm's financial performance. Third, most of the research on capital structure was performed in developed economies and financial markets. For instance, Gropp and Heider (2010) show that the capital structure of U.S. and European banks is mainly determined by the same factors mentioned in the literature about non-financial firms, and is only weakly impacted by the governmental deposit insurance or the regulatory capital requirements. Hence, it is important to perform similar research in the context of a developing market and compare its results with the results of the existing literature.

This study examines 24 Egyptian banks listed on The Egyptian Stock Exchange. The empirical data for the study covers the period from 1995 to 2007, and is collected from Kompass Egypt, The Egyptian Stock Exchange website and the corporate websites. Our dependent variable - the firm's capital structure - is regressed against three independent variables (a) the firm's profitability, (b) the firm's growth rate and (c) the firm's size. The total debt ratio (TDR = the total debt divided by the total assets) is used as a main proxy for the firm's capital structure. In order to test the sensitivity of our results we split the total debt into long-term debt and short-term debt, and utilize two alternative measures of capital structure: (a) long-term debt ratio (LDR = long-term debt divided by total assets) and (b) short-term debt ratio (SDR = short-term debt divided by total assets).

The rest of the paper is organized as follows: after a review of the literature in the second section, we develop our hypotheses in section 3; section 4 presents our sample and elaborates on the empirical model; section 5 presents and analyzes the results; and finally section 6 concludes the paper and recommend topics for future research.

2. LITERATURE REVIEW

The question of how should a firm apportion its financing between debt and equity has been discussed for long time. Franco Modigliani and Merton Miller (1958) were the first to put this debate into a rigorous mathematical framework. Their conclusion on the irrelevance of the capital structure for the firm's value has ignited and still continues to inspire a vast academic debate on this subject. During the last fifty years new dimensions have been added to the debate on the irrelevance of firm's capital structure decision.

Modigliani and Miller's (MM) Proposition I states that there is no one combination of debt and equity that is better than another. This theory, building on oversimplified assumptions (where there are no taxes) shows that the firm’s valuation is independent of its financial structure. MM Proposition II attempts to answer the question of why the rate of return increases with an increase in the debt ratio. It states that the increased expected rate of return generated by debt financing is exactly offset by the risk incurred, for any chosen financing mix. In the case when interest is not tax deductible, a firm’s owners would be indifferent as to whether the firm's projects are financed by debt or equity. When interest is tax deductible, they would maximize the value of the firm by using 100 percent debt financing.

Unlike the MM oversimplified theory, the Pecking Order Theory (Myers and Majluf, 1984) considers the consequences of different methods of financing on the information asymmetry costs for the investor. It states that firms will consider all methods of financing available and use the least expensive source in the first place. Titman and Wessels (1988) suggest that firms should consider financing new projects in the following manner: first use internally generated funds, next use external debt and as a last resort, use external equity. The important difference is that the equity is divided into two parts, internal equity and external equity. Internal equity is the one that is available for investments in the form of retained earnings, whereas external equity is the one that must be obtained from outside sources by issuing new shares.

By developing the information asymmetry approach from a different perspective, Ross (1977) and Noe (1988) suggest that firms issuing debt send a positive signal about their future prospects. The issuance of bonds shows that the company has more investment opportunities and growth prospects than it can handle with internally generated funds. The reasoning behind this is that managers who are unsure of the future profitability will not expose the firm to bankruptcy risks. Therefore, only those firms that are confident in their ability to repay obligations will issue debt.

Frank and Goyal (2003) found that internal financing is not sufficient to cover investment expenditures on average; therefore external financing is heavily used. However, debt financing does not dominate equity financing. On the other hand, the Trade-off Theory (Harris and Raviv, 1991) suggests that firms with substantial amounts of intangible assets should rely on equity financing, whereas firms with important amounts of tangible assets should rely more heavily on debt financing. The trade-off theory also clarifies that profitable companies, because of their lower bankruptcy risk, can take greater advantage of the tax shield by using more debt financing (Berk et al., 2010; Attaoui and Poncet, 2013). Thus, profitable companies are capable of having greater debt ratios than the less profitable companies. This implies that there is no optimum amount of debt for any individual company.

Finally, the Agency Theory approach to capital structure, developed by Jensen and Meckling (1976) and Myers (1977), asserts that an optimal amount of debt will be determined by minimizing the agency costs arising from conflicts of interest between the involved parties: managers, shareholders and bondholders. Morellec et al. (2012) show that differences in agency costs explain a large amount of the company-level differences in terms of capital structure.

With regard to the determinants of the capital structure policy, Martin and Scott (1974) take a practical perspective and suggest eight major factors to be considered by the firms: leverage, liquidity, profitability, dividends, market price, firm size, sales growth and variability. In another empirical study, Chittenden et al. (1996) explored the determinants of capital structure for a sample of small firms. They showed that the capital structure is mostly affected by profitability, asset structure, size, age and access to the capital market.

2.1 Firm Profitability and Capital Structure Decision

According to Bouallegui (2006), the current profitability of a firm reflects its future earning power and represents the basic concern of its shareholders. Taub (1975) found a significant positive relationship between the debt ratio and measures of profitability. Champion (1999) pointed out that the use of leverage was one way to improve the performance of the firm. Other studies such as Ross (1977) and Noe (1988) suggest that increasing the leverage by issuing debt is a positive signal issued by the management about the firm's value and performance. In general, these theories refer to the disciplinary role of debt. Since increasing debt would also increase bankruptcy and liquidation costs, only managers who expect better future performance will choose to issue debt. However, Harding et al. (2013) notice that a bank's clients usually benefit from deposit insurance provided by the government, and a bank's assets are mostly highly liquid financial assets. These two facts significantly reduced the risk of bankruptcy and explain the high amount of debt issued and deposits collected by banks, irrespective of their performance.

On the other hand, Myers (1977) demonstrates that firms will prefer funding their existing assets by borrowing, while future growth options (i.e. present value of expected future earnings) will be financed by raising capital. The Pecking Order Theory can be used to clarify this prediction. The theory contends that higher profitability will correspond to a lower debt-to-equity ratio, which also implies a negative relationship between profitability and the debt-to-assets ratio. Moreover, Fama and French (1998) argue that the excessive use of debt creates agency problems between shareholders and creditors, which could result in a negative relationship between leverage and profitability. For instance, in an empirical study on Polish firms, Hammes (1998) found a negative relationship between the debt ratio and profitability.

Bouallegui (2006) studied a sample of 99 German firms listed on the Deutsch Bourse over the period 1998-2002. Her results corroborate the trade-off theoretical framework: profitable firms prefer debt in order to benefit from the better tax shield. Moreover, since past profitability is a good proxy for future profitability, Bouallegui (2006) found that profitable firms borrow more because the likelihood of paying back their loans is greater.

2.2 Firm Growth Rate and Capital Structure Decision

Michaelas et al. (1999) showed that growth might be either positively or negatively related with leverage. On one hand growth will push firms into seeking external financing, as firms with high growth opportunities are more likely to exhaust internal funds and require additional capital. On the other hand, firms with considerable growth opportunities tend to have greater fluctuation in their value; the greater the fluctuations in the firm's value, the greater the firm's risk. The higher risk for profitable firms makes it harder for them to raise external borrowing with favorable terms. This implies that there might be a negative relationship between firm’s growth and leverage.

Martin and Scott (1974) tackled the relationship between the firm growth rate and its leverage from another point of view: i.e. the variability in the sales growth rate. According to their study, firms must consider both their sales growth and the variability of this growth. A firm whose growth is somewhat stable will feel more confident about its ability to repay debt and will tend to issue bonds. On the other hand, firms whose sales growth tends to fluctuate more will issue common stock when raising capital.

Hutchinson et al. (1998) performed an empirical study using a very large and reliable database of UK small enterprises in order to test various hypotheses concerning the determinants of capital structure. They found that once a firm reaches a large enough size, financial institutions are prepared to lend to them on the basis of their growth potential. Daskalakis and Psillaki (2008) performed a study on a sample of French and Greek firms, for the period 1997-2002. They investigated if and how growth, as measured by the annual change in earnings, affects the firm's capital structure. Their results show that there may be either a negative or positive relationship between a firm's growth rate and leverage.

According to Jensen and Meckling (1976), it is possible that the growth of a firm affects the market reaction to debt announcements. One might expect that a high growth firm could afford to have greater financial leverage because it could generate enough earnings to support the additional interest expense. On the other hand, it may be riskier for a low growth firm to increase its financial leverage as its earnings may not increase enough so as to repay the additional obligations.

2.3 Firm Size and Capital Structure Decision

Bouallegui (2006) finds that the size of the firm is positively related to its leverage and suggests several explanations for this. First, larger firms tend to be more diversified and have a lower probability of default. The second reason is that transaction costs associated with debt tend to be much lower in the case of larger firms. Finally, information costs are likely to decrease as the firm becomes larger, since the quality of financial information improves and mistrust tends to diminish.

Chittenden et al. (1996) suggest that, according to the pecking order theory, there is a positive relationship between a firm's size and its sources of financing. They measure size in terms of sales, and find that smaller firms are more likely to rely on internal funds, while larger firms are more likely to use long term debt. This result is confirmed by Lemmon et al., (2008) who use the same proxy for size. Moreover, Daskalakis and Psillaki (2008) find that banks are generally more willing to lend to larger firms, as compared to smaller firms.

3. RESEARCH HYPOTHESES

According to the Pecking Order Theory, firms will fund their projects by using internally generated funds first, then external debt and as a last resort they use external equity (Titman and Wessels, 1988). Furthermore, profitable firms will depend more on their retained earnings in funding their projects, and will usually borrow less compared to less profitable firms. Therefore we expect to find a negative relationship between a firm's profitability and leverage (Abor, 2007; Lemmon et al., 2008). Moreover, we expect that firms having a high profitability ratio will rely less on debt financing.

Hypothesis 1: *High firm profitability is associated with lower reliance on debt financing.*

There might be either a positive or a negative relationship between the firm's growth rate and the firm's capital structure. The positive association can be justified on the following grounds: firms with a stable growth rate will have greater confidence in their ability to repay the loans and will therefore prefer issuing fixed income securities, rather than issuing capital (Martin and Scott, 1974; Benston et al., 2003). On the other hand, a negative relationship can be justified too: firms with a considerable growth rate usually have some variations in their values (i.e. high risk), which affect their ability to raise debt (Michaelas et al., 1999). In addition, in the event of bankruptcy or liquidation, growth opportunities have no value, which leads firms with growth opportunities to rely less on debt financing (Morellec et al. 2012).

Hypothesis 2: *There is an association (either positive or negative) between the firm's growth rate and its capital structure.*

There is a positive relationship between the firm size and its ability to rely on debt; the larger the firm in terms of total assets the greater its ability to raise debt. Larger firms tend to be more diversified, which leads to lower probability of default. Moreover, larger firms are usually considered more trustworthy by the lenders (Bouallegui, 2006). Finally, the main sources of funding in the case of the banking industry are the customer's deposits as well as the issuance of bonds with different maturities. As a result, the bank's assets are mostly financed by leverage (Gropp and Heider, 2010; Harding et al., 2013). For this reason we expect to find that larger Egyptian banks (as measured by the amount of total assets) are characterized by relatively higher leverage than smaller banks.

Hypothesis 3: *There is a positive relationship between the size of the firm and its ability to rely on debt financing.*

4. DATA SAMPLING AND RESEARCH MODEL

The data utilized in our econometric test was collected from Kompass Egypt, The Egyptian Stock Exchange website and the corporate websites. The collected bank's financial information covers a period of 13 years, from 1995 to 2007. The detailed list of banks included in our sample is presented in Appendix A.

The choice of the ending year of our sample was motivated by fact than the Egyptian banking sector was seriously affected by the global financial crisis in 2008. Later on, the economic environment in Egypt was further worsened by a political crisis. Therefore including the recent years in the sample would have distorted our results and led to wrong conclusions.

4.1 Dependent Variable

The variable of primary interest in this study is ‘the capital structure’. Different measures for capital structure have been used in the prior literature, such as the total debt ratio, the owner’s equity ratio, the debt-to-equity ratio and the capital structure ratio. As a more general measure of capital structure we use the Total Debt Ratio (TDR). It is calculated as follows:

$$TDR = \text{Total Debt} / \text{Total Assets} \qquad \text{eq. (1)}$$

Rauh and Sufi (2010) show that capital structure decisions depend on the availability long- and short-term sources of debt financing. This availability may be different according to the firm's profitability. Therefore, short-term and long-term debt ratios may have different determinants. In order to verify the robustness of our results to different proxies of capital structure, we utilize two other alternative measures for our dependent variable: the Long-term Debt Ratio (LDR) and the Short-term Debt Ratio (SDR). These two ratios are computed as follows:

LDR = Long-term Debt ÷ Total Assets

SDR = Short-term Debt ÷ Total Assets

4.2 Independent Variables

According to our hypotheses, three independent variables are used in this study: firm's profitability, size and growth rate. The firm's profitability was measured by two main ratios: Return on Assets (ROA) and Return on Equity (ROE).

ROA = Net Income ÷ Total Assets

ROE = Net Income ÷ Owners Equity

According to the existing literature the firm size (SIZE), was measured by the value of total assets. The firm growth rate was proxied by two measures; Earnings Growth Rate (Eg) and Assets Growth Rate (Ag).

Ag = (Current Year Assets - Previous Year Assets) ÷ Previous Year Assets

Eg = (Current Year Net Income - Previous Year Net Income) ÷ Previous Year Net Income

The above ratios are computed on a yearly basis, starting from year 1995 till year 2007, for all of the 24 banks studied.

4.3 Research Model

Two statistical tools were employed in order to test the association between a firm's capital structure and the independent variables, profitability, size and growth rate: bivariate correlation analysis and regression analysis. The tests were performed by using the econometrics software MINITAB and EVIEWS. All the tests were based on panel data econometric techniques. The panel data econometric techniques are powerful research instruments, allowing to take into account the cross sectional as well as the time variances in the data, and finally to estimate the empirical model in a more accurate manner.

According to Greene (2003), the advantage of combining time series and cross sections in panel data is that we are able to examine issues that could not be studied in either cross sectional or time series settings alone. The use of panel data reduces collinearity among the explanatory variables thus improving the efficiency of econometric estimates. Furthermore, panel data models can take into account to a greater extent and in a dynamic way the heterogeneity that characterizes firms. Thus, we decided to use panel data methodology instead of simple cross-section analysis.

4.3.1 Panel Data Analysis. Panel data estimation is a state-of-the-art technique considered to be an efficient method in handling econometric data. Panel data has become popular among social scientists because it allows the inclusion of data for N Cross-sections (Eg: countries, households, firms, individuals etc.) and T time periods (Eg: years, quarters, months etc.). The combined panel data matrix set consists of a time series for each cross sectional member in the data set and offers a variety of estimation methods. In this case the number of observations available increases by including developments over time.

According to Brüderl (2005), the basic idea behind panel data analysis comes from the notion that the individual relationships will all have the same parameters. This is sometimes known as the pooling assumption as we are in effect pooling all the individuals together into one dataset and imposing a common set of parameters across them. If the pooling assumption is correct then panel data estimation can offer some considerable advantages:

1. The sample size can be increased considerably by using a panel and hence much better estimators can be obtained.

2. Under certain circumstances the problem of omitted variables, which might cause biased estimates in a single individual's regression, may not occur in a panel context.

A common problem with time-series estimations is that samples usually include few observations, which mechanically reduces the significance of r-ratios or F-statistics of the regressions (Brüderl, 2005). This problem is common with annual data estimations, since there are very few annual series that extend more than 50 years. An efficient solution for this problem is to 'pool' the data into a panel of time series from different cross sectional units. This pooling of the data generates differences among the different cross-sectional or time-series observations that can actually be captured with the inclusion of dummy variables (Brüderl, 2005). This use of dummies to capture systematic differences among panel observations results in what is known as a fixed-effects model, the easiest way of dealing with pooled data.

Consider for example a simple linear panel model with one explanatory variable as given by:

$$Y_{it} = \alpha + \beta\, x_{it} + u_{it}$$

where the variables Y and X have both i and t subscripts for i = 1, 2 … N sections and t = 1, 2 … T time periods.

In this simple panel, the coefficients α and β don't have any subscripts, suggesting that they will be the same for all units and for all years. In the fixed-effects method the constant is treated as section-specific. This means that the model allows for different constants for each section. So the model is:

$$Y_{it} = \alpha_i + \beta_1\, x_{it} + \beta_2\, x_{2it} + \ldots + \beta_k\, x_{kit} + u_{it}$$

According to Greene (2003), the fixed effects estimator is also known as the least-squares dummy variables (L&DV) estimator. In order to allow for different constants in each group, it includes a dummy variable for each group. The dummy variable is the one that allows us to take different group-specific estimates for each of the constants for every different section. The fixed effects model has the following properties:

1. It essentially captures all effects that are specific to a particular individual and that do not vary over time. Hence, if we had a panel of countries the fixed effects would take full account of aspects such as geographical factors and any other of the many basic factors that vary between countries but not over time.
2. In some cases it may involve a very large number of dummy constants, as some panels may have thousands of individual members.

The fixed effect model will use up to N degrees of freedom, where N is the number of cross-sectional units.

4.3.2 The Panel Data Regression Model. Our three hypotheses specified in the previous section imply three independent variables to be included in the regression model: firm's performance, size, and growth rate. Moreover, a firm's performance is proxied via two alternative measures (ROA and ROE), while growth is measured by two other indicators (earnings growth rate - Eg, and assets growth rate - Ag). This generates four combinations of independent variables. Finally, three alternative measures of ownership structure are used for each combination of independent variables: total debt ratio (TDR), long-term debt ratio (LDR) and short-term debt ratio (SDR). This generates the following twelve equations, necessary for the empirical modeling and testing of our hypotheses:

$$TDR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 Eg_{it} + \varepsilon_{it} \quad \text{eq. (1)}$$
$$LTDR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 Eg_{it} + \varepsilon_{it} \quad \text{eq. (2)}$$
$$STDR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 Eg_{it} + \varepsilon_{it} \quad \text{eq. (3)}$$

$$TDR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 Ag_{it} + \varepsilon_{it} \quad \text{eq. (4)}$$
$$LDR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 Ag_{it} + \varepsilon_{it} \quad \text{eq. (5)}$$
$$SDR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 SIZE_{it} + \beta_3 Ag_{it} + \varepsilon_{it} \quad \text{eq. (6)}$$

$$TDR_{it} = \beta_0 + \beta_1 ROE_{it} + \beta_2 SIZE_{it} + \beta_3 Eg_{it} + \varepsilon_{it} \quad \text{eq. (7)}$$

$LDR_{it} = \beta_0 + \beta_1 ROE_{it} + \beta_2 SIZE_{it} + \beta_3 Eg_{it} + \varepsilon_{it}$ eq. (8)

$SDR_{it} = \beta_0 + \beta_1 ROE_{it} + \beta_2 SIZE_{it} + \beta_3 Eg_{it} + \varepsilon_{it}$ eq. (9)

$TDR_{it} = \beta_0 + \beta_1 ROE_{it} + \beta_2 SIZE_{it} + \beta_3 Ag_{it} + \varepsilon_{it}$ eq. (10)

$LDR_{it} = \beta_0 + \beta_1 ROE_{it} + \beta_2 SIZE_{it} + \beta_3 Ag_{it} + \varepsilon_{it}$ eq. (11)

$SDR_{it} = \beta_0 + \beta_1 ROE_{it} + \beta_2 SIZE_{it} + \beta_3 Ag_{it} + \varepsilon_{it}$ eq. (12)

Where,
TDR_{it} = total debt ratio of the bank *i* at time *t*
LDR_{it} = long-term debt ratio of the bank *i* at time *t*
SDR_{it} = short-term debt ratio of the bank *i* at time *t*
$SIZE_{it}$ = total assets of the bank *i* at time *t*
Ag_{it} = percentage change in assets of the firm *i* between time *t* and *t*-1
Eg_{it} = percentage change in earnings of the firm *i* between time *t* and *t*-1
ROE_{it} = return on equity of the bank *i* at time *t*
ROA_{it} = return on assets of the bank *i* at time *t*
ε_{it} = error term.

One can notice that all the models use panel data specifications.

5. DATA ANALYSIS AND HYPOTHESIS TESTING

5.1 Correlation Analysis

Bivariate analysis was performed by using the Pearson correlation coefficients. The correlations were computed between the dependent variables and the independent variables, as well as between every pair of independent variables. Our sample was split into two sub-samples in order to account for potential differences between banks with different ownership status, namely governmental banks and investment (non-governmental) banks. For instance, Brav (2009) reports that private (non-listed) firms rely heavily on debt financing, while public (listed) companies tend to issue more share capital. We expected a similar divide between governmental and non-governmental firms.

Correlation coefficients for governmental banks are provided in Table 1. The correlations show that our main dependent variable - the total debt ratio (TDR) - is weakly correlated with all the independent variables in our different models. Moreover, only the short-term debt (SDR) ratio is positively and significantly (at the 0.1% level) correlated with TDR, which means that most of the debt raised by Egyptian governmental banks consists of short-term deposits and borrowings.

Table 1. Correlations between Variables of Interest for Eight Governmental Egyptian Banks

	Ag-gov	Eg-gov	LDR-gov	ROA-gov	ROE-gov	SDR-gov	Size-gov
Eg-gov	-0.034						
	(0.755)						
LDR-gov	-0.261**	0.044					
	(0.014)	(0.679)					
ROA-gov	0.279***	0.196*	-0.039				
	(0.008)	(0.066)	(0.71)				
ROE-gov	0.221**	0.228**	0.144	0.833****			
	(0.038)	(0.032)	(0.161)	(0.000)			
SDR-gov	0.139	-0.032	-0.779****	0.058	-0.052		
	(0.195)	(0.766)	(0.000)	(0.573)	(0.612)		
Size-gov	0.215**	-0.022	-0.396****	-0.14	-0.073	0.313***	
	(0.045)	(0.838)	(0.000)	(0.174)	(0.48)	(0.002)	
TDR-gov	0.087	0.002	-0.025	0.046	0.092	0.646****	0.017
	(0.421)	(0.984)	(0.805)	(0.657)	(0.372)	(0.000)	(0.871)

Note: The table reports Pearson correlation coefficients and corresponding P-value in parentheses. Ag-gov = assets growth rate of governmental banks, Eg-gov = earnings growth rate of governmental banks, LDR-gov = long-term debt ratio of governmental banks, ROA-gov = return on assets of governmental banks, ROE-gov = return on equity of governmental banks, SDR-gov = short-term debt ratio of governmental banks, Size-gov = size of governmental banks measured in terms of total assets, TDR-gov = total debt ratio of governmental banks.
*, **, ***, and **** denote significance at the 10%, 5%, 1%, and 0.1% level, respectively.

On the other hand, our results exhibit a strong negative correlation between the long-term debt ratio (LDR) and both the asset growth ratio (Ag) and the total assets (Size) of governmental banks, at respectively 5% and 0.1% levels of significance. These negative correlations are consistent with the idea developed by Michaelas et al. (1999) that the high growth rate may reduce the firm’s ability to raise debt; growth opportunities are usually associated with greater variations in the firm's value and are therefore a greater risk for the lender. However, our findings contradict the prediction by Bank and Lawrenz (2013) that banks with profitable but risky assets will issue more long-term debt and will collect less short-term deposits.

The correlation coefficients in Table 1 show a positive and significant (at the level of 1%) association between the short-term debt ratio (SDR) and Size. These results are consistent with Chittenden et al. (1996), who hypothesized that smaller firms are more likely to rely on internal funds rather than issuing debt as a source of finance, while larger firms are more likely to use long term debt. Finally, we find a strong negative correlation between SDR and LDR, significant at the 0.1% level. This result reveals that more (less) short-term borrowings or deposits collected by the Egyptian governmental banks are usually associated with less (more) long-term debt issued.

The correlation coefficients for the Egyptian non-governmental (investment) banks are displayed in Table 2. Contrary to the case of the governmental banks, the correlation analysis for the investment banks shows several significant associations between TDR and the independent variables in our model. For instance, both ROE and Size exhibit significant correlations with TDR, with P-values for both equal to 0.010. On the other hand ROA and Eg are characterized by significant negative correlations with TRD, both at the level of 5%. Only Ag shows an insignificant correlation with TDR for the case of investment banks.

The positive correlation between TDR and ROE is consistent with the findings of Ross (1977) and Noe (1988). They suggested that a firm will issue debt (instead of equity) so as to signal the market about an increase in its profitability. On the other hand, the negative correlation between TDR and ROA is consistent with the Pecking Order Theory. The latter states that profitable firms tend to rely more on their retained earnings and less on issuing debt.

Table 2. Correlations between Variables of Interest for Sixteen Investment Banks

	Ag-inv	Eg-inv	LDR-inv	ROA-inv	ROE-inv	SDR-inv	Size-inv
Eg-inv	0.149**						
	(0.045)						
LDR-inv	-0.007	-0.018					
	(0.926)	(0.81)					
ROA-inv	0.14*	0.827****	-0.062				
	(0.055)	(0.000)	(0.387)				
ROE-inv	0.042	0.075	-0.067	0.472****			
	(0.572)	(0.311)	(0.348)	(0.000)			
SDR-inv	0.038	-0.017	-0.969****	0.016	0.109		
	(0.605)	(0.82)	(0.000)	(0.817)	(0.125)		
Size-inv	0.155**	0.06	-0.04	0.071	0.101	0.084	
	(0.035)	(0.419)	(0.579)	(0.32)	(0.154)	(0.238)	
TDR-inv	0.119	-0.145**	0.009	-0.172**	0.183**	0.24***	0.182**
	(0.106)	(0.049)	(0.905)	(0.015)	(0.010)	(0.001)	(0.010)

Note: The table reports Pearson correlation coefficients and corresponding P-value in parentheses. Ag-inv = assets growth rate of investment banks, Eg-inv = earnings growth rate of investment banks, LDR-inv = long-term debt ratio of investment banks, ROA-inv = return on assets of investment banks, ROE-inv = return on equity of investment banks, SDR-inv = short-term debt ratio of investment banks, Size-inv = size of investment banks measured in terms of total assets, TDR-inv = total debt ratio of investment banks.
*, **, ***, and **** denote significance at the 10%, 5%, 1%, and 0.1% level, respectively.

Finally, LDR and SDR are highly negatively correlated with each other (at the 0.1% significance level), but exhibit insignificant correlations with the all the independent variables.

It is clear from the above results that there are some major differences in the determinants of capital structure policies for governmental and investment banks in Egypt. The capital structure determinants cited in the prior literature are significantly correlated with the total debt financing, but uncorrelated with the internal structure of that debt, in the case of investment banks. For governmental banks we observe the opposite: the common capital structure determinants are well correlated only with the short-term and long-term components of the bank's debt but not with the total debt ratio. These results need yet to be confirmed by the multivariate analysis.

5.2 Regression Analysis

For the multivariate analysis we used panel data multiple regressions. Similarly to the bivariate analysis we divided the banks in our sample into two main categories according to their ownership structure: 8 governmental banks and 16 investment banks.

According to our empirical model presented in the previous section we tested 12 equations (eq.(1) - eq.(12)) with both sub-samples of governmental and investment banks. The most significant results for the 12 models tested with our governmental and investment banks sub-samples are presented in Appendix B.

Our conclusions about the hypotheses tests will be drawn mainly on the basis of the models using the total debt ratio (TDR) as independent variable (i.e. equations (1), (4), (7) and (10)). The specifications using long-term debt ratio (LDR) and short-term debt ratio (SDR) are performed as robustness checks.

We select and analyze here the models with dependent variable TDR exhibiting the best fit according to the F-statistic, respectively for governmental and investment banks.

5.2.1 Governmental Banks. Table 3 exhibits the regression results of the model specification with the best fit, for the sub-sample of governmental banks. The results of this test show a strong negative relationship between ROE and TDR, significant at the 5% level. Similarly, TDR is negatively impacted by Eg, and this relationship, although not very strong in terms of magnitude, is highly significant (at the 0.1% level). However, the impact of the size of the bank on its total debt ratio appears to be insignificant. These results imply that growing and well-performing governmental banks tend to finance their growth with sources other than debt or deposits.

The model as a whole exhibits an excellent fit with an R-squared of almost 100% and highly statistically significant F statistic. This model is estimated by using the Generalized Least

Square (GLS) method in order to control for heteroskedasticity. Serial autocorrelations are also controlled by using an AR(1) error term.

Table 3. The Model with Best Fit for Governmental Banks

Dependent Variable: TDR
Method: GLS (with cross section weights to control for heteroskedasticity)
Included observations: 12 (years 1995-2006)
Number of cross-sections used: 8
Total panel (unbalanced) observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROE	-1.346874	0.548305	-2.456433	0.0166
SIZE	1.29E-08	8.96E-09	1.433754	0.1562
Eg	-0.000495	0.000100	-4.939401	0.0000

Fixed Effects
ALX (94.86605), EXP (90.33202), SUZ (92.23931), AGR (88.16380), MSR (95.48912), HOS (93.83838), IND (82.63144), NAT (96.99187)

Weighted Statistics

R-squared	0.999966	F-statistic	681122.7
Adjusted R-squared	0.999961	Prob(F-statistic)	0.000000

Note: TDR = total debt ratio, ROE = return on Equity, SIZE = total assets, Eg = percentage change in earnings. Firm codes are provided in Appendix A

Interestingly, one can notice by looking at Table 3 that most of the value of the bank's total debt ratio is explained by the firm-specific fixed effects (between 82% for bank IND and 96% for bank NAT). In other words, although two of the variables in the model (ROE and Eg) are statistically significant determinants of the bank's total debt ratio, most of the amount of this ratio is predetermined by other stable firm-specific factors, remaining outside of the model. This phenomenon has already been reported by Gropp and Heider (2010) for the case of U.S. and European non-financial firms.

The above results appear to be sensitive to the choice of measures for our dependent and independent variables (see Appendix B). For instance, the ROA, as a measure of profitability, appears to be an equivalently good predictor of TD as the ROE used in the model presented in Table 3. However, the alternative measure of growth rate, Ag, is a weak predictor of TDR, contrary to Eg. Moreover, none of our models is able to predict with good degree of confidence the long-term debt ratio for governmental banks, while only one model specification predicts very well the short-term debt ratio. Surprisingly, in the latter model (see Appendix B, Table B.3) only Size is a good predictor of SDR, while performance and growth rate measures are not.

5.2.2 Investment Banks. Table 4 reports the regression results of the specification with the best fit, for the sub-sample of investment banks. The results of this test show that the bank's performance (as measured by the ROA) and growth rate (as measured by Ag) are again strong predictors of its total debt ratio. Nevertheless, while the regression coefficient of ROA is negative and statistically significant, similar to the governmental banks, the coefficient of Ag is positive and statistically significant. This implies that investment banks, contrary to governmental banks, tend to finance their expansion by issuing more debt or collecting of more deposits. The effect of bank size on its total debt is again insignificant.

Table 4. The Model with Best Fit for Investment Banks

Dependent Variable: TDR
Method: Pooled Least Squares
Included observations: 13 (years 1995-2007)
Number of cross-sections used: 16
Total panel (unbalanced) observations: 169

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	-55.15221	10.25142	-5.379955	0.0000
SIZE	-8.28E-08	6.31E-08	-1.311824	0.1916
Ag	3.312456	0.665843	4.974831	0.0000

Fixed Effects

BNP (93.10599), BAR (92.32152), CRE (88.89347), GUL (88.02694), SAU (93.70419), FAI (96.99234), IRA (81.94488), BLO (89.14712), NSG (92.82762), COM (93.88889), AFR (92.79853), COR (87.12671), WAT (92.21495), HSB (93.32513), PIR (90.11653), AUD (83.76177)

Statistics

R-squared	0.752271	F-statistic	150.8216
Adjusted R-squared	0.720682	Prob(F-statistic)	0.000000

Note: TDR = total debt ratio, ROA = return on assets, SIZE = total assets, Ag = percentage change in total assets. Firm codes are provided in Appendix A

The model as a whole exhibits an excellent fit with an adjusted R-squared of 72% and a highly significant F statistic. This model is estimated by using the Pooled Least Squared method since heterogeneity in the sub-sample of investment banks is much lower than in the sub-sample of governmental banks. Alternative estimations using the Generalized Least Square method provide similar results (see Appendix B). Possible serial autocorrelations are controlled by using an AR(1) error term.

Finally, the results in Table 4 show that, similarly to the governmental banks, most of the value of the investment banks' total debt ratio is explained by the firm-specific fixed effects (between 82% for bank IRA and 93.7% for bank SAU). This confirms that most of the amount of the debt ratio is predetermined by other stable firm-specific factors, remaining outside of the model (Gropp and Heider, 2010).

Similarly to the case of governmental banks, the above results for investment banks appear to be sensitive to the choice of measures for our independent variables (see Appendix B). For instance, the ROE, as a measure of performance, is a weaker predictor of TDR than the ROA used in the above model. The alternative measures of growth rate, Eg and Ag, exhibit equivalent explanatory power over the level of TDR. However, unexpectedly, the impact of Eg on TDR is negative, contrary to the positive effect of Ag.

On the other hand, the results in Table 4 are partly confirmed with alternative measures for our independent variable. The long-term debt ratio (LDR) appears to be explained by both Eg and ROA. However the effect of Eg on LDR is negative, contrary to the positive effect of Ag on TDR reported in Table 4. The short-term debt ratio (SDR) is significantly determined by ROA, ROE and Eg. However, contrary to the results in Table 4, both ROE and ROA exert positive significant impact on SDR. Likewise, the impact of Eg on SDR is negative and significant, contrary to the positive effect of Ag on TDR reported in Table 4.

5.3 Hypothesis Testing

We summarize here the implications of the empirical results on test of our three hypotheses. Based on the formulation of our hypotheses, the below analysis builds mainly on the use of total debt ratio (TDR) as a measure of bank's capital structure.

Hypothesis 1: *High firm profitability is associated with lower reliance on debt financing.*

The above hypothesis is tested by using both the correlation analysis and the panel data regression analysis. In the case of governmental banks, the Pearson correlations in Table 1 show that there is an insignificant correlation between the bank's TDR and the two measures of profitability, ROA and ROE. On the other hand, the regression analyses (Table 3 and Appendix B) show a significant negative effect of both ROA and ROE on TDR. Because of the inferior robustness of the bivariate correlation analysis compared to the multivariate regression analysis, we can conclude that there is no substantial evidence to reject Hypothesis 1 for the subsample of Egyptian governmental banks.

In the case of the investment banks, the Pearson correlation coefficients in Table 2 show the expected negative significant association between ROA and TDR, while the association between TDR and the alternative measure of profitability, ROE, is unexpectedly positive and significant. On the other hand, the regression analyses (see Table 4 and Appendix B) confirm the significant negative impact of ROA on TDR but fail to confirm that the alternative measure of performance, ROE, can be a significant predictor of TDR. Overall, the superior explanatory power of the multivariate regression analysis leads us to conclude that Hypothesis 1 should not be rejected in the case of Egyptian investment banks, if the ROA is used as a measure of profitability.

Therefore, our empirical tests imply that Hypothesis 1 can be accepted in the cases of both governmental and non-governmental Egyptian banks. This result corroborates the predictions made by Myers (1977) and the Pecking Order Theory (Myers and Majluf, 1984). The negative relationship between debt financing and return on assets is also consistent with the prior empirical literature (Abor, 2007; Lemmon et al., 2008).

Hypothesis 2: *There is an association (either positive or negative) between the firm's growth rate and its capital structure.*

The growth rate in this study was measured by the growth rate of assets (Ag) and the growth rate of earnings (Eg). In the case of governmental banks, the correlation analysis in Table 1 shows no association between TDR and both Ag and Eg. On the other hand, our regression analyses (Table 3 and Appendix B) show that only Eg can help explain the total debt ratio (i.e. negative, statistically significant effect of Eg on TDR). These findings provide only partial support to Hypothesis 2 in the sub-sample of Egyptian governmental banks, for the case when earnings growth is used as a measure of the firm's growth rate.

For the sub-sample of investment banks our correlation analysis (Table 2) shows that only Eg is negatively and significantly associated with TDR. The results of our regression analysis confirm the negative impact of Eg on TDR (Appendix B), but show a positive and statistically significant effect of Ag on TDR (Table 2 and Appendix B). Therefore, Hypothesis 2 can be accepted for the subsample of investments banks.

Overall, Hypotheses 2 finds strong support in our results for both governmental and investment banks, but mainly when a firm's growth rate is measured in terms of earnings growth. In this case, a higher growth rate leads to a lower amount of total debt raised. On the other hand, a high growth rate, as measured by the growth of assets, is financed by more debt only in the case of investment banks. Overall, our results are consistent with the findings in the prior empirical literature (Daskalakis and Psillaki, 2008; Hutchinson et al., 1998; Michaelas et al., 1999).

Hypothesis 3: *There is a positive relationship between the size of the firm and its ability to rely on debt financing.*

The size of the banks in our study was measured by using the amount of its total assets. In the subsample of governmental banks the size appears to be uncorrelated with TDR (Table 1). The regression analysis confirms that the size of the banks does not explain its total debt ratio. Therefore, hypothesis 3 should be rejected for the subsample of governmental banks.

For the sub-sample of investment banks, the correlation between SIZE and TDR is positive and statistically significant (Table 2). However, this result is not confirmed by the multiple regression analysis (Table 4 and Appendix B), suggesting that the association between SIZE and TDR in the correlation analysis might be created by the components of the total debt ratio, LDR and SDR.

Overall, our results provide enough evidence to reject Hypothesis 3, implying that there is no direct relationship between the size of the Egyptian banks (measured in total assets) and their propensity to raise debt funding. This contradicts the predictions of the Pecking Order Theory and the finding of prior empirical research (e.g. Daskalakis and Psillaki, 2008)

6. DISCUSSION AND CONCLUSION

In this study we attempted to explain the determinants of the capital structure decisions made by Egyptian banks. We found in the prior literature (e.g. Pecking Order Theory, Trade-off Theory, Agency Theory) three potential determinants: firm performance, growth rate and size. Our results show that both governmental and investment banks with a high return on assets usually have larger amounts of debt compared to their counterparts reporting lower returns on assets. Furthermore, Egyptian banks having a high (low) earnings growth ratio exhibit lower (higher) propensity to use debt financing. Finally, in contrast with the prior theoretical and empirical literature, our results reject any direct association between the size of the Egyptian banks, as measured by total assets, and their total debt ratio.

However these results are highly sensitive to alternative measures of leverage, such as the short-term debt ratio or long-term debt ratio. This sensitivity implies that, while the existing theories may be good enough to explain the overall proportion of debt versus equity financing, they need further refinement so as to explain the proportion of long-term versus short-term debt. Moreover, our results are sensitive to alternative measures of profitability (ROA versus ROE) and growth rate (assets growth versus earnings growth rate). This means that different alternative measures cited above may not reflect exactly the same economic substance. Therefore, in the case of the banking sector, specific measures should be designed for the concepts usually proposed in the general financial decisions literature.

Finally, the results of our panel data regression analysis highlight an interesting pattern reported recently by Gropp and Heider (2010) for the case of U.S. and European non-financial firms. More specifically, the Egyptian banks' capital structure is mainly determined by the same factors that are usually proposed to explain the financial structure of non-financial institutions. More interestingly, there are predominant firm-specific fixed effects, which are relatively stable over time and explain most of the capital structure variations across banks. This finding implies that the determinants of capital structure decisions proposed in the theoretical literature, although significant, can explain only a small portion of the idiosyncratic capital structure variances across firms. This bears to the Gropp and Heider's call to find other explanatory variables or other theoretical approaches in the field of corporate financing decisions.

On the other hand, our results are subject to two limitations. First, they may be affected to some extent by potential multicollinearity between our independent variables. Multicollinearity arises when two or more independent variables in a model are highly correlated, which leads to inflated correlation coefficients. Such multicollinearity, although being theoretically limited between the independent variables in our model (profitability, growth rate and size), may be potentially important in the measures used to proxy theses independent variables. For instance, the profitability was measured using both the return on assets and the return on equity (ROA and ROE), the growth rate was measured using asset growth rate and earnings growth rate (Ag and Eg) and the size was measured according to the bank's total assets. Thus, in some of our regression specifications the total assets were involved in the measures of all three independent variables. Likewise, in other specifications the banks' earnings were involved in the measure of both the profitability and the growth rate. In these cases our correlation coefficients may be inflated due to multicollinearity.

Another limitation of the study is related to the size and nature of our sample. The sample includes 24 Egyptian banks, which represent a substantial share of the Egyptian banking sector. However, our results cannot be generalized to other sectors of the Egyptian economy; neither can they be extended to banking sectors in other courtiers with a different institutional environment.

Despite these limitations our findings make two main contributions to the existing literature. First, our results corroborate the findings reported by previous studies on the same topic. The dissimilarities with the prior literature should be due to different methodologies (e.g. we use panel data regression analysis), or to the specific institutional environment differentiating the Egyptian banking sector.

Second, the results of this research can help understand, to a certain extent, the capital structure policies implemented by Egyptian banks. The study highlights two major factors limiting the capacity of Egyptian banks to raise debt: i.e. the high return on assets combined with high earnings growth expectations.

Finally, the present study raises several questions needing more thorough investigation by future research. Our results prompt the need to investigate alternative determinants of the capital structure decision in the case of financial firms in general, and in the case of Egyptian banks, more specifically. Those alternative determinants should be supported by further theoretical arguments, but may include for instance the liquidity ratio of the bank, its asset structure, its age, etc. Differences between determinants of short-term and long-term debt financing should also be considered in future research.

Fan et al. (2012) show that capital structure may differ significantly from one country to another because of the different legal and tax systems. Therefore, similar investigations should be performed in other developing economies with different legal and tax environments. For instance, the current study may be extended so as to include other sectors of the Egyptian economy, as well as another emerging country and one highly industrialized country.

REFERENCES

Attaoui, S. and Poncet, P. 2013. Capital Structure and Debt Priority. Financial Management 42(4): 737-775

Abor, J. 2007. Debt policy and performance of SME's: Evidence from Ghanaian and South African firms, Journal of Risk Finance 8(4): 364 - 379.

Bank, M., and Lawrenz, J. 2013. Deposit Finance as a Commitment Device and the Optimal Debt Structure of Commercial Banks. European Financial Management 19(1): 14-44.

Benston, G., Irvine, P., Rosenfeld, J., and Sinkey, J.F. 2003. Bank Capital Structure, Regulatory Capital, and Securities Innovations. Journal of Money, Credit & Banking 35(3): 301-322.

Berk, J.B., Stanton, R. and Zechner, J. 2010. Human Capital, Bankruptcy, and Capital Structure. Journal of Finance 65(3): 891-926.

Berle, A. and Means, G. 1932. The Modern Corporation and Private Property, Macmillan, New York.

Bouallegui, I. 2006. Capital Structure Determinants and the New High-Tech Firms: The Critical Distinction between Fixed and Random Effects through a Static Panel Data Investigation, MPRA Paper 22477, University Library of Munich, Germany.

Brav, O. 2009. Access to Capital, Capital Structure, and the Funding of the Firm. Journal of Finance 64(1): 263-308.

Brüderl, J. 2005. Panel Data Analysis, University of Mannheim. URL: http://www.sowi.uni-mannheim.de/lehrstuehle/lessm/veranst/Panelanalyse.pdf

Champion, D. 1999. Finance: The Joy of Leverage. Harvard Business Review 77(4): 19-22.

Chittenden, F., Hall, G. and Hutchinson, P. 1996. Small Firm Growth, Access to Capital Markets and Financial Structure: Review of Issues and an Empirical Investigation. Small Business Economics 8(1): 59-67.

Copeland, T.E. and Weston, J.F. 1988. Financial Theory and Corporate Policy, 3rd edition, Addison-Wesley, Massachusetts.

Daskalakis, N. and Psillaki, M. 2008. Do Country or Firm Factors Explain Capital Structure? Evidence from SMEs in France and Greece. Applied Financial Economics 18(2): 87-97.

Donaldson, G. 1961. Corporate Debt Capacity: A Study of Corporate Debt Capacity, Division of Research, Harvard School of Business Administration, Boston.

Fama, E.F. and French, K.R. 1998. Testing Trade off and Pecking Order Predictions about Dividends and Debt. Review of Financial Studies 8(1): 1-33.

Fan, J.H., Titman, S., and Twite, G. 2012. An International Comparison of Capital Structure and Debt Maturity Choices. Journal of Financial & Quantitative Analysis, 47(1): 23-56.

Frank, M.Z. and Goyal V.K. 2003. Testing the Pecking Order Theory of Capital Structure. Journal of Financial Economics 67(2): 217-248.

Friedman, M. 1962. Capitalism and Freedom, University of Chicago Press, Chicago.

Greene, W.H. 2003. Econometric Analysis, 5th Ed., Prentice Hall, New Jersey.

Gropp, R., and Heider, F. 2010. The Determinants of Bank Capital Structure. Review of Finance 14(4): 587-622.

Hammes, K. 1998. Various Aspects of Capital Structure in Poland, *in* Papers of the 4th Conference on Financial Sector Reform in Central and Eastern Europe, 24- 26 April, Vol. 2, Tallinn Technical University, Tallinn.

Harding, J., Liang, X., and Ross, S. 2013. Bank Capital Requirements, Capital Structure and Regulation. Journal of Financial Services Research 43(2): 127-148.

Harris, M. and Raviv, A. 1991. The Theory of Capital Structure. Journal of Finance 46(1): 297-355.

Hutchinson, P., Hall, G. and Michaelas, N. 1998 The Determinants of Capital Structure for Micro, Small and Medium-Sized Enterprises, Proceedings of the 43rd Annual World Conference of the International Council for Small Business, Nanyang Technological University, Singapore, pp. 1-9.

Jensen, M.C. and Meckling, W.H. 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. Journal of Financial Economics 3(4): 305-360.

Kim, E.H. 1978. A Mean-variance Theory of Optimal Capital Structure and Corporate Debt Capacity. The Journal of Finance 33(1): 45-63.

Kraus, A. and Litzenberger, R. 1973. A State-preference Model of Optimal Financial Leverage. Journal of Finance 28(4): 911-922.

Lemmon, M.L., Roberts, M.R., and Zender, J.F. 2008. Back to the Beginning: Persistence and the Cross-Section of Corporate Capital Structure. Journal of Finance 63(4): 1575-1608.

Martin, J.D. and Scott, D.F. 1974. A Discriminant Analysis of the Corporate Debt-Equity Decision. Financial management (Winter) 71-79.

Michaelas, N., Chittenden, F. and Poutziouris, P. 1999. Financial Policy and Capital Structure Choice in UK SMEs: Empirical Evidence from Company Panel Data. Small Business Economics 12(2): 113-130.

Modigliani, F. and Miller, M.H. 1958. The Cost of Capital, Corporate Finance and the Theory of Investment, American Economic Review 48(3): 261-297.

Morellec, E., Nikolov, B., and Schürhoff, N. 2012. Corporate Governance and Capital Structure Dynamics. Journal of Finance 67(3), 803-848

Myers, S.C. 1977. Determinants of Corporate Borrowing. Journal of Financial Economics 5(2): 147-175.

Myers, S.C. 1984. The Capital Structure Puzzle. The Journal of Finance 39(3): 575-592.

Myers, S.C. and Majluf, N. 1984. Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have. Journal of Financial Economics 13(2): 187-221.

Noe, T. 1988. Capital Structure and Signaling Game Equilibria. Review of Financial Studies 1(4): 331-355.

Rauh, J.D. and Sufi, A. 2010. Capital Structure and Debt Structure. Review of Financial Studies, 23(12), 4242-4280.

Ross, S. 1977. The Determination of Financial Structure: The Incentive Signaling Approach. The Bell Journal of Economics 8(1): 23-40.

Scott, J.H. 1976. A Theory of Optimal Capital Structure. Bell Journal of Economics 7(1): 33-54.

Taub, A.J. 1975. Determinants of the Firm's Capital Structure. The Review of Economics and Statistics 57(4): 410-416.

Titman, S. and Wessels, R. 1988. The Determinants of Capital Structure Choice. The Journal of Finance 18(1): 1-19.

APPENDIX A

Table A.1 Banks included in the dataset

Name	Code	Type
1) BNP Paribas	BNP	Investment Bank
2) Barclays	BAR	Investment Bank
3) Credit Agricol	CRE	Investment Bank
4) Egyptian Gulf Bank	GUL	Investment Bank
5) Egyptian Saudi Finance Bank	SAU	Investment Bank
6) Faisal Islamic Bank	FAI	Islamic Bank
7) Misr Iran Bank	IRA	Investment Bank
8) Bloom Bank	BLO	Investment Bank
9) National Societe General Bank	NSG	Investment Bank
10) Commercial International Bank	COM	Investment Bank
11) Arab African Bank	AFR	Investment Bank
12) Arab Banking Corporation	COR	Investment Bank
13) Watany Bank of Egypt	WAT	Investment Bank
14) HSBC	HSB	Investment Bank
15) Piraeus Bank	PIR	Investment Bank
16) Audi Bank	AUD	Investment Bank
17) Bank of Alexandria	ALX	Governmental Bank
18) Export development Bank	EXP	Governmental Bank
19) Suez Canal Bank	SUZ	Governmental Bank
20) Principal Bank for agriculture	AGR	Governmental Bank
21) Banque Misr	MSR	Governmental Bank
22) Housing and Development Bank	HOS	Governmental Bank
23) Industrial Development Bank	IND	Governmental Bank
24) National Bank of Egypt	NAT	Governmental Bank

APPENDIX B: Results of Panel Data Regression Analysis

Variable abbreviations used in the tables of this appendix:
TDR= total debt ratio
LDR = long term debt ratio
SDR= short term debt ratio
SIZE = size of the firm as measured in total assets
Ag = percentage change in total assets
Eg = percentage change in earnings
ROE = return on equity
ROA = return on assets

Note: the tables reported below include only results of regression tests with significant level of fit (F-statistic). All models use panel data with cross-sectional fixed effect and control for serial correlation of first or second order (i.e. specifications with AR(1) or AR(2)).

Governmental Banks

Table B.1

Dependent Variable: TDR				
Method: GLS (Cross Section Weights)				
Included observations: 12 (years 1995-2006)				
Number of cross-sections used: 8				
Total panel (unbalanced) observations: 81				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROE	-1.346874	0.548305	-2.456433	0.0166
SIZE	1.29E-08	8.96E-09	1.433754	0.1562
Eg	-0.000495	0.000100	-4.939401	0.0000
Fixed Effects: ALX (94.86605), EXP (90.33202), SUZ (92.23931), AGR (88.16380), MSR (95.48912), HOS (93.83838), IND (82.63144), NAT (96.99187)				
Weighted Statistics				
R-squared	0.999966	F-statistic		681122.7
Adjusted R-squared	0.999961	Prob(F-statistic)		0.000000
S.E. of regression	13.68011	Sum squared resid		12913.04
Log likelihood	-158.5169	Durbin-Watson stat		2.013550

Table B.2

Dependent Variable: TDR				
Method: GLS (Cross Section Weights)				
Included observations: 11(years 1996-2006)				
Number of cross-sections used: 8				
Total panel (balanced) observations: 72				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROA	-45.53178	13.06704	-3.484476	0.0009
SIZE	2.85E-09	6.52E-09	0.436869	0.6638
Ag	0.471697	0.993810	0.474635	0.6368
Fixed Effects: ALX (95.15406), EXP (91.45977), SUZ (93.06805), AGR (89.01830), MSR (96.33445), HOS (94.28877), IND (83.75202), NAT (98.04231)				
Weighted Statistics				
R-squared	0.999918	F-statistic		243028.9
Adjusted R-squared	0.999903	Prob(F-statistic)		0.000000
S.E. of regression	13.92335	Sum squared resid		11631.58
Log likelihood	-146.4702	Durbin-Watson stat		1.415225

Table B.3

Dependent Variable: SDR				
Method: Pooled Least Squares				
Included observations: 12 (199- 2006)				
Number of cross-sections used: 8				
Total panel (unbalanced) observations: 73				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROA	-20.86966	154.1347	-0.135399	0.8927
SIZE	-6.26E-07	1.66E-07	-3.769745	0.0004
Eg	-0.000384	0.000889	-0.432341	0.6670
Fixed Effects: ALX (113.1311), EXP (74.93036), SUZ (97.51182), AGR (96.98157), MSR (159.5280), HOS (79.55637), IND (63.49519), NAT (149.2957)				
Statistics				
R-squared	0.667380	F-statistic		40.79756
Adjusted R-squared	0.607400	Prob(F-statistic)		0.000000
S.E. of regression	12.09416	Sum squared resid		8922.385
Log likelihood	-278.9964	Durbin-Watson stat		2.094804

Investment Banks

Table B.4

Dependent Variable: TDR				
Method: Pooled Least Squares				
Included observations: 12 after adjusting endpoints (years 1996-2007)				
Number of cross-sections used: 16				
Total panel (unbalanced) observations: 167				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROA	-14.30588	20.98027	-0.681873	0.4964
SIZE	-2.28E-08	5.90E-08	-0.386331	0.6998
Eg	-0.000215	0.000104	-2.062605	0.0409
Fixed Effects: BNP (94.25825), BAR (92.06423), CRE (89.57768), GUL (87.77125), SAU (93.73652), FAI (96.44928), IRA (81.01101), BLO (89.17946), NSG (92.11001), COM (91.82621), AFR (92.70114), COR (87.59684), WAT (91.92197), HSB (92.81258), PIR (91.82867), AUD (82.47718)				
Statistics				
R-squared	0.730910	F-statistic		133.0954
Adjusted R-squared	0.696130	Prob(F-statistic)		0.000000
S.E. of regression	2.821865	Sum squared resid		1170.550
		Durbin-Watson stat		2.049468

Table B.5

Dependent Variable: TDR				
Method: Pooled Least Squares				
Included observations: 13 (years 1995-2007)				
Number of cross-sections used: 16				
Total panel (unbalanced) observations: 169				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROA	-55.15221	10.25142	-5.379955	0.0000
SIZE	-8.28E-08	6.31E-08	-1.311824	0.1916
Ag	3.312456	0.665843	4.974831	0.0000
Fixed Effects: BNP (93.10599), BAR (92.32152), CRE (88.89347), GUL (88.02694), SAU (93.70419), FAI (96.99234), IRA (81.94488), BLO (89.14712), NSG (92.82762), COM (93.88889), AFR (92.79853), COR (87.12671), WAT (92.21495), HSB (93.32513), PIR (90.11653), AUD (83.76177)				
Statistics				
R-squared	0.752271	F-statistic		150.8216
Adjusted R-squared	0.720682	Prob(F-statistic)		0.000000
S.E. of regression	2.688111	Sum squared resid		1076.665
		Durbin-Watson stat		1.849119

Table B.6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: TDR				
Method: Pooled Least Squares				
Included observations: 13 (1995-2007)				
Number of cross-sections used: 16				
Total panel (unbalanced) observations: 169				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROE	-0.526905	1.808914	-0.291282	0.7712
SIZE	-7.32E-08	7.23E-08	-1.012761	0.3128
Ag	3.022717	0.719628	4.200387	0.0000
Fixed Effects: BNP (93.36379), BAR (91.47454), CRE (88.22577), GUL (87.29046), SAU (93.70844), FAI (96.67499), IRA (81.29148), BLO (89.16024), NSG (91.78095), COM (92.80051), AFR (91.65363), COR (86.46571), WAT (91.55204), HSB (92.26471), PIR (89.83957), AUD (87.95136)				
R-squared	0.704575	F-statistic		118.4527
Adjusted R-squared	0.666903	Prob(F-statistic)		0.000000
S.E. of regression	2.935504	Sum squared resid		1283.961
		Durbin-Watson stat		1.749043

Table B.7

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Dependent Variable: LDR				
Method: GLS (Cross Section Weights)				
Included observations: 12 (years 1996-2007)				
Number of cross-sections used: 16				
Total panel (unbalanced) observations: 166				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROA	-3.105463	4.446518	-0.698403	0.4860
SIZE	-1.50E-09	1.56E-08	-0.095740	0.9239
Eg	-9.92E-05	2.15E-05	-4.625463	0.0000
Fixed Effects: BNP (3.130413), BAR (0.616158), CRE (1.221758), GUL (1.028544), SAU (0.335215), FAI (0.271370), IRA (2.508902), BLO (1.793191), NSG (1.535164), COM (5.194608), AFR (32.74919), COR (4.532153), WAT (0.407622), HSB (1.876555), PIR (0.555595), AUD (0.468282)				
Weighted Statistics				
R-squared	0.649045	F-statistic		90.00253
Adjusted R-squared	0.603373	Prob(F-statistic)		0.000000
S.E. of regression	26.88271	Sum squared resid		105511.3
		Durbin-Watson stat		1.834578

Table B.8

Dependent Variable: LDR				
Method: GLS (Cross Section Weights)				
Included observations: 13 (years 1995-2007)				
Number of cross-sections used: 16				
Total panel (unbalanced) observations: 168				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROA	-24.81588	2.086648	-11.89270	0.0000
SIZE	-2.25E-08	2.08E-08	-1.077987	0.2828
Ag	-0.274403	0.286703	-0.957097	0.3401
Fixed Effects: BNP (3.730524), BAR (1.235863), CRE (1.772714), GUL (1.338920), SAU (0.531349), FAI (0.698289), IRA (3.091895), BLO (1.966697), NSG (2.369707), COM (6.166323), AFR (29.63880), COR (4.891475), WAT (0.855938), HSB (2.693523), PIR (0.674165), AUD (0.670764)				
Weighted Statistics				
R-squared	0.667686	F-statistic		99.12045
Adjusted R-squared	0.625024	Prob(F-statistic)		0.000000
S.E. of regression	26.07594	Sum squared resid		100633.3
		Durbin-Watson stat		1.772078

Table B.9

Dependent Variable: SDR				
Method: GLS (Cross Section Weights)				
Included observations: 12 (1996-2007)				
Number of cross-sections used: 16				
Total panel (unbalanced) observations: 167				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROA	18.24495	8.671638	2.103979	0.0371
SIZE	2.06E-08	2.42E-08	0.854240	0.3944
Eg	-0.000242	6.90E-05	-3.509133	0.0006
Fixed Effects: BNP (90.85013), BAR (90.61810), CRE (87.68704), GUL (86.29493), SAU (93.14330), FAI (95.45916), IRA (77.75660), BLO (87.15262), NSG (89.33054), COM (85.02655), AFR (59.04617), COR (82.99787), WAT (90.86838), HSB (89.81581), PIR (91.04669), AUD (81.83067)				
Weighted Statistics				
R-squared	0.999825	F-statistic		280674.5
Adjusted R-squared	0.999803	Prob(F-statistic)		0.000000
S.E. of regression	26.11925	Sum squared resid		100285.7
		Durbin-Watson stat		1.828017

Table B.10

Dependent Variable: SDR				
Method: GLS (Cross Section Weights)				
Included observations: 13 (years 1995-2007)				
Number of cross-sections used: 16				
Total panel (unbalanced) observations: 169				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROE	1.570986	0.805930	1.949284	0.0531
SIZE	1.38E-08	2.63E-08	0.524716	0.6006
Ag	0.929097	0.602542	1.541962	0.1252
Fixed Effects: BNP (90.05105), BAR (90.38393), CRE (87.26774), GUL (86.35360), SAU (92.91308), FAI (95.40761), IRA (77.71417), BLO (87.09574), NSG (89.22213), COM (85.10108), AFR (62.05246), COR (82.80124), WAT (90.77625), HSB (89.58890), PIR (89.91377), AUD (84.01129)				
Weighted Statistics				
R-squared	0.999708	F-statistic		170180.2
Adjusted R-squared	0.999671	Prob(F-statistic)		0.000000
S.E. of regression	25.80452	Sum squared resid		99215.11
		Durbin-Watson stat		1.758468