

## **RELEVANCE OF CAPITAL STRUCTURE THEORIES IN A TAX-EXEMPTED ECONOMY: Evidence from the United Arab Emirates**

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### **ABSTRACT**

*The purpose of this paper is to investigate the applicability of capital structure theories in the case of publicly-listed companies of the United Arab Emirates (UAE). The nonexistence of corporate and personal taxes as well as an increasing concentration on non-oil sectors makes this country as an interesting case study. We find that the predicted effects of individual explanatory variables on leverage of UAE firms support the proposition of the pecking order theory. Such evidence remains consistent in both boom and crisis periods of the economy, suggesting that publicly-listed UAE companies rely more on their own internal source of funding irrespective of any economic condition of the country. This evidence contains an important message for managers of other private and foreign business entities about managing their own capital more efficiently to remain as competitive as publicly-listed UAE companies.*

*Key words:* Capital Structure, Trade-off Theory, Pecking Order Theory, Agency Cost Theory

*JEL classification:* G32

### **1. INTRODUCTION**

The predictions of conventional capital structure theories have been well examined mainly in the context of developed economies. However, the applicability of the theoretical fundamentals in capital structure decisions by firms in emerging and developing countries is still limited. This is even insufficient in the case of emerging Middle-Eastern countries. In this paper, we therefore examine the relevance of three conventional capital structure theories including the static trade-off theory, the pecking order theory, and the agency cost theory in the case of publicly-listed companies of the United Arab Emirates (UAE), one of the fastest growing economies among the Gulf Cooperation Council (GCC) countries.

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Booth, Aivazian, Demircug-Kunt and Maksimovic (2001) find that the variables that are relevant for explaining capital structures in the United States and European countries are also relevant in developing countries despite the profound differences in institutional factors across their sample developing countries.<sup>1</sup> Nonetheless, the institutional environment is significantly different in the case of UAE companies compared to many firms operating even in other emerging countries. For instance, except oil companies and foreign banks, business entities in the manufacturing and service industries are tax exempted in the UAE. Further, there are no taxes on dividend and capital gain in this country. The nonexistence of tax incentives makes it an interesting case study to test the applicability of the trade-off theory on capital structure in the UAE. Further, the publicly-listed firms are less likely to face bankruptcy as these firms are either owned by big conglomerates or members of the ruling family, which ultimately encourage banks and other financial institutions to extend both short- and long-term loans with minimal scrutiny. Therefore, the actual trade-off between bankruptcy and debt tax shield is almost absent in this specific case. Additionally, the compensation packages of top managers of the publicly-listed companies are well-structured in the UAE. These executives are usually foreign expatriates with good reputation in their respective industries. The chief executives in several of those companies are also closely connected with the ruling family. Some of those publicly-listed companies are also family-owned business entities. Compared to private companies, the agency conflicts between managers and other stakeholders are therefore expected to be minimal in most of the publicly-listed companies as senior managers of these entities do not have any reason to misallocate the company's funds for their own personal interests. As such, the underlying propositions of the agency cost theory might not be applicable in the case of UAE companies. Further, the publicly-listed companies are usually large and financially solvent business entities in the UAE, and thus they might be unwilling to borrow extensively to reduce the excessive cost of external funds, which coincides with the pecking order theory. Such distinctive features of publicly-listed UAE companies raise an important question about the relevance of the above three theories of capital structure in this unique business environment.

While a rapid growth in the financial sector, privatization in the manufacturing and service sectors, and a fast shift from the resource-based to the knowledge-based economy make the UAE as an attractive place for foreign investment in recent years, foreign entrepreneurs and business managers are still unaware of several important corporate strategies, such as capital financing, that are usually followed by local business entities in this country. Analyzing the capital structure choices by local companies in the UAE is important for foreign entities so that they can make a better choice about their own financing decision in this competitive business environment. In this study, we in particular address three critical questions related to firm's capital structure. Those are: how do publicly-listed UAE firms make their borrowing decisions? What are the factors that usually influence the leverage of these companies? Do financing choices differ in the period of economic growth as opposed to economic crisis in this market?

Our results exhibit that the pecking order theory of capital structure works well in the case of UAE companies. This recommends that publicly-listed firms prefer their own internal funds to external resources for financing new projects. This finding is supported by several firm-specific characteristics. For example, we find that large companies and firms with more tangible assets are highly leveraged business entities in the UAE. Further, profitable and highly liquid

firms borrow less money from financial institutions. Critically, we do not find any significant impact of government ownership on a firm's borrowing decision. Importantly, we find consistent evidence about the capital structure of UAE firms in both boom and crisis periods, suggesting that publicly-listed local companies are reluctant to change their financing decisions irrespective of any economic condition in the country.

We organize the rest of the paper as follows. We briefly discuss the theories of capital structure in section 2, and summarize the key findings in relevant literature based on other GCC countries in section 3. We highlight our research methodology in section 4, and discuss the results in section 5. We conclude the paper in section 6.

## **2. LITERATURE REVIEW**

Substantial numbers of empirical investigation have been conducted in an attempt to identify the determinants of capital structure choices by firms. It is quite important to understand those theories prior to determining their applicability in firm's capital structure decision in the UAE. In this section, we therefore briefly discuss three main theories of capital structure including the trade-off, pecking order, and agency cost theories.

### **2.1. Static Trade-off Theory**

The contemporary corporate income tax system indicates that the interest on debt is a tax-deductible expense. Thus the return to bondholders escapes taxation at the corporate level and as a consequence, this tax shield grants debt financing an important advantage over other financing tools. Since borrowing money reduces the firm's tax payments, and thus increases the available cash flow to companies, the debt tax shield augments the after-tax value of a firm. However, Myers (1984) argues that excessive debt is always accompanied with a risk of failure to repay the creditors. When leveraged companies honor their promises to creditors with difficulty, financial distress occurs, which as a consequence, levels up the investors' worries and bears some direct and indirect costs on the firm. Those incurred costs of financial distress will significantly reduce the tax shield benefits obtained from excessive borrowing and take a bite out of the firm's value. Myers extends the Modigliani and Miller theory and argues that the capital structure is a sort of balance or a trade-off between the amount of debt tax shield benefit and the cost of financial distress. Consequently, this so called trade-off theory rationalizes moderate debt ratios and encourages companies to move gradually toward a target debt-to-equity ratio that maximizes firm value and minimizes cost. Accordingly, the trade-off theory recognizes that profitable companies with many tangible assets are highly leveraged.

### **2.2. Pecking Order Theory**

Inspired and posited by Myers and Majluf (1984), the pecking order theory stems in large from the asymmetric information principle. The theory points out that corporate manager knows more about the firm's opportunities, profitability, and business risks than outside investors. Therefore, any information revealed by the management would act as a signal to those investors. For instance, when management announces high profitability or an increase in dividends, the stock prices positively reacts to this statement. Conversely, the announcement to issue equity

would be interpreted by investors that the firm's share price is overvalued. Likewise, Eckbo (1986) analyzes the impact of corporate debt announcements on share prices within a two-day announcement period, and finds that straight debt offering has a negative impact on common stock prices. To avoid debt and equity issuances announcements, firms therefore prioritize their financing decisions by employing their internally generated cash as the first source of funding. When earnings are exhausted or are not sufficient to finance their expansion activities, they resort to debt since it is less sensitive to information and generally managers prefer debt to undervalued equity (Brealey, Myers and Franklin, 2006). Convertible debts form the third option to firms while the last alternative would be the additional offering of new stocks, which is the most expensive source of funding. This is due to the cost of floatation on the one hand, and the asymmetric information it spurs between managers and investors on the other hand. Hence, the pecking order theory states that firms neither have an optimal capital structure nor a predetermined debt-to-equity ratio. Instead, they have a chain of financing choices that starts with internal funding, followed by debt, convertible debt, and then external equity issuing.

### **2.3. Agency Cost Theory**

The agency problem is characterized by the conflict of interest between the owner (the principal) and the manager (the agent) of the firm. This conflict becomes serious when the firm generates substantial free cash flows. In that case, managers can spend the excess funds on their own benefits. Therefore, debt and its obligations may diminish such a conflict by reducing the cash available to managers on the one hand and forcing them to work efficiently in order to pay the debt service on the other hand. Jensen and Meckling (1976) highlight the role of the agency costs in the financing decision. Stockholders of leveraged firms are inclined to over invest because if the investment turned unsuccessful, lenders and bondholders will probably bear the cost. And, when this happens the firm may face a phase of financial distress and accordingly have restricted access to debt sources. From this standpoint, reaching a certain targeted debt level, through the use of secured long-term and short-term debt, may mitigate this traditional shareholder-bondholder conflict of interests and reduce such agency problem. Moreover, it is expected that the firm's debt level is positively correlated with the regulations, screening and monitoring activities that are imposed on managers. In an empirical research concerning the effect of bank debts on the firm's capital structure, Johnson (1998) confirms the proposition that firms can benefit from bank screening and monitoring, thus mitigating the agency cost. In the theory of free cash flows, Jensen (1986) further highlights the benefit of debt in motivating managers, improving their productivity and inducing discipline and efficiency, which makes the managers' goals much closer to those of the shareholders.

### **3. STUDIES RELATED TO THE GCC COUNTRIES**

Little research has been undertaken to examine the factors that influence the financing choices of individual companies in the GCC countries. This is perhaps because economic transformation towards a market economy in most of the Middle Eastern countries did not take shape until the early 1990s (Dasgupta, Keller, and Srinivasan, 2002). This includes privatization, free flow of capital, diversification of economies, and encouraging foreign direct investments. Secondly, the number of publicly listed firms in manufacturing and service industries are still limited in

this region. Thirdly, the equity market in most of those countries did not commence until the late 1990s.

Among the limited number of studies, Al-Sakran (2001) examines the determinants of capital structure of listed firms in Saudi Arabia in light of its unique tax code, the *Zakat*, which is based on a company's total net worth. He finds that firm size and government share exhibit a positive relationship with leverage where growth, profitability, and return on assets reveal a negative relationship with leverage. In contrast, Al-Ajmi, Hussain, and Al-Saleh (2009) observe that the capital structure of Saudi firms is positively affected by profitability, size, growth opportunities, and institutional ownership whereas it is negatively impacted by tangibility, government ownership, family ownership, business risk, dividend payments, and liquidity. Nonetheless, both evidences can be biased at a certain extent due to the fact that the debt employment among firms in Saudi Arabia is fairly limited and below international norms. Importantly, the listed companies mainly use equity as a financing tool due to the absence of a bond market on the one hand, and the limited sources of financing mechanisms that complies with Islamic Sharia on the other hand. Recently, Sbeiti (2010) has tested the determinants of capital structure for firms in three GCC countries, namely Kuwait, Saudi Arabia and Oman. In the study, Sbeiti examines the impact of a spectrum of firm-specific factors in addition to some stock market development indicators on firms' financing choices during the period 1998-2005. She reveals strong support in favor of the pecking order theory across the three countries with little evidence for the static trade-off and agency cost theory. She further argues that stock markets in those countries play a dominant role in corporate financing decisions. While the study includes several firm-specific determinants such as firm size, profitability, tangibility, growth, liquidity and interest rates, we believe that there should have a significant impact of government share in business entities on firm's capital structure decision in this part of the world as the governments of the GCC countries are major shareholders in most of the publicly listed companies. Importantly, Deesomsak, Pandyal, and Pescetto (2004) suggest that government's involvement in companies' ownership gives those firms better access to capital markets, and minimizes the potential risk for financial distress. Additionally, the government share in firms gives confidence to all types of investors including creditors and shareholders to invest in those companies. Finally, Ellili and Farouk (2011) is the only study that examines the capital structure of all publicly listed firms in the Abu Dhabi Stock Exchange (Abu Dhabi is one of the seven Emirates in the UAE). They find that firm's asset turnover, size, growth, operating risk, and managerial ownership are positively correlated with long-term borrowing by Abu Dhabi firms. However, their paper excludes the publicly listed companies of the Dubai Financial Market (DFM). Notably, DFM is one of the most important financial centers of the country. Most importantly, the recent economic crisis in the UAE severely affected the overall performance of DFM, and therefore including the publicly-listed companies in DFM is important for us to determine any significant change in firms' capital structures during the crisis period.

#### **4. RESEARCH DESIGN**

##### **4.1. Research Context**

The United Arab Emirates (UAE) is one of six members of the Gulf Cooperation Council (GCC) countries located in the Arabian Peninsula. The other member countries are Bahrain, Kuwait,

Oman, Qatar, and Saudi Arabia. All GCC countries share several common features associated with their social, political, and economic systems. For instance, these countries are modern, tax exempted, and resource based emerging economies. Their financial regulations and economic outlook are more or less similar. Compared to others, the UAE has relatively more developed financial capital market. Two stock markets were established in two main cities of the country, Abu Dhabi and Dubai, in 2000. However, trading in equities and bonds was restricted to UAE nationals until 2004. Thus, the UAE stock market is still new with only 8 years of experience of effective trading activities between local and foreign participants. Further, the country has a well-established credit market consisting of 23 local and 28 foreign commercial banks. Notably, the UAE does not have any sort of tax on personal income, dividend income, and capital gain. All publicly listed companies, except oil companies and foreign banks, also enjoy zero corporate taxes, and thereby the UAE is a tax-free economy for all companies in manufacturing and service industries.

The considerable oil and gas reserves help the UAE to enjoy distinctive characteristics. According to IMF Report 2009, the UAE holds the seventh largest oil reserve in the world, and has the highest per capita gross domestic product of \$46,584. The country has the fourteenth largest purchasing power per capita on the globe and a relatively high Human Development Index with a global ranking of 35. The UAE is classified as a high income developing economy by the IMF. While companies are less likely to face bankruptcy, the economic slump in 2008 caused UAE companies to suffer vast losses and had a strong negative impact on their profitability. The debacle started when the booming real estate industry of Dubai suffered severe problems around the middle of 2008. The performance of the real estate market was severely deteriorated in 2009. As a result, most of the commercial banks and regulatory bodies in the UAE took extra precautions to prevent any possibility of bankruptcy by real estate companies. Subsequently, many firms in the real-estate and construction industries halted their projects for an indefinite period of time. In addition, a considerable number of firms started selling their tangible assets in an attempt to repay their creditors, and the growth plans of many firms across the industry put on hold. That affected the whole economy, particularly Dubai, so badly that the Dubai Government finally declared on November 25, 2009 to reschedule repayment of their outstanding loans. Due to tight credit policy of commercial banks, individual companies of several industries were then required to adjust their own financing requirements. Compared to other GCC member countries, this particular incident in the UAE provides us a unique case study to investigate whether total leverage of the publicly-listed UAE firms had been dramatically changed after the beginning of the crisis in mid-2008, and thereby the applicability of the capital structure theory was significantly changed in the crisis period. To address this issue, we re-examine the effect of each determinant on firm's leverage separately for the boom (2001-2007) and crisis (2008-2009) periods in the UAE, which is difficult to apply in the context of other GCC member countries since these economies were not as enormously affected as the UAE due to real estate market crash.

#### **4.2. Sample Data, Variables, and Empirical Model**

We use an unbalanced panel data set of 38 publicly listed non-financial and non-utility UAE firms covering the sample period from 2001 to 2009. Our sample consists of a total of 235 firm-

year observations. The limited number of publicly listed manufacturing and service related companies in the UAE stock exchanges is the main limitation in this empirical study. We collect all required data from *Zawya*, an electronic database that consists of financial information of publicly-listed companies. We consider three different proxy measures of firm's leverage (*LEV*): (a) the ratio of long-term debt to total capital (*LTDCAP*), (b) the ratio of total debt to total capital (*TDCAP*), and (c) the ratio of total debt to total assets (*TDASSET*) in our analysis. Among them, long-term debt includes long-term conventional and Islamic bank loans, long-term leases, corporate bonds, and Islamic bonds, called *Sukuk*. Further, total debt includes both short- and long-term debts of a firm, where short-term debt includes bank loans payable within one year, bank overdraft, and other interest carrying debts in current liabilities. Finally, the firm's capital is equal to total debt and book value of total equity of a firm. Because of the lack of reliable data on the market value of debt, we use the book value of both long-term debt and total debt in calculating each of the above measures of leverage. Since the stock markets of the UAE are less efficient (see Moustafa, 2004), equity mispricing may over or under estimate market value of firm's total capital. We therefore consider the book value instead of market value of equity to calculate total capital of individual firms.

We consider six key firm-specific factors as individual determinants of leverage. They are: firm size (*SIZE*), profitability (*PR*), collateral (*COLL*), growth (*GR*), liquidity (*LIQD*), and government share (*GOVTSH*). We limit ourselves to these variables for three critical reasons: First, these factors are found empirically robust, statistically significant, and highly correlated with leverage in extant literature on capital structure based on developed countries (e.g., Frank and Goyal, 2008; Antoniou, Guney, and Paudyal, 2008). Second, the absence of corporate tax in publicly-listed local UAE firms averts us from using other tax related factors, such as, non-debt tax shield. Third, the lack of time-series data of several other financial and non-financial indicators constrains us to choose the selected firm-specific determinants. In addition to the above variables, we include three industry dummy variables to absorb any sector-specific effect on firm's capital structure. These three key industries of UAE include gas & petroleum (*GAS-PETRO*), real-estate & construction (*REL-CONS*), and tourism & services (*TOUR-SERV*). We use the manufacturing sector as a base industry. Finally, we consider the years from 2001 to 2007 as the boom period whereas the years of 2008 and 2009 as the crisis period in the UAE economy. In the model, we consider the boom years as the base period. The definition of each explanatory variable is as follows:

- SIZE* : Logarithm of firm's total assets.
- PR* : Ratio of operating income to total assets of a firm.
- COLL* : Ratio of fixed tangible assets to total assets of a firm.
- GR* : Percentage change in total assets of a firm.
- LIQD* : Ratio of current assets minus inventory to current liabilities.
- GOVTSH* : A dummy variable that is equal to one for firms with government share equal to or greater than 5%, and zero otherwise.

To determine the impact of each variable on firm's capital structure, we estimate the coefficients of the following model by applying fixed-effect panel regression method:

$$LEV_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PR_{it-1} + \beta_3 COLL_{it-1} + \beta_4 GR_{it} + \beta_5 LIQD_{it} + \beta_6 GOVTSH_{it} + \beta_7 CRISIS_{it} + \beta_8 GAS-PETRO_{it} + \beta_9 REL-CONS_{it} + \beta_{10} TOUR-SERV_{it} + \varepsilon_{it}$$

In this model, *LEV* is defined by three different measures of leverage as discussed above. Further, we consider *PR* and *COLL* at the beginning of the year to avoid any simultaneous effect between these variables and *LEV*. *CRISIS* is a dummy variable that is equal to 1 if the sample year belongs to the period 2008-2009, 0 otherwise. Likewise, *GAS-PETRO*, *REL-CONS* and *TOUR-SERV* are individual dummy variables representing gas & petroleum, real-estate & construction, and tourism & service industries, respectively.

### 4.3. Hypotheses in the Context of UAE Firms

In this section, we discuss the possible relationship between each of the above variables and leverage in the context of three different theories. The predicted relationship finally allows us to determine a theory of capital structure that works best in the case of publicly-listed UAE firms.

#### 4.3.1. Firm Size

Titman and Wessel (1988) argue that large firms are less prone to bankruptcy and have a lower cost of financial distress. As a consequence, they have easier access to the credit market for both short- and long-term loans. This is more likely in the case of local large companies in the UAE. Similarly, large UAE firms are usually cash rich business entities and therefore prone to over invest. To prevent such misallocation of resources, these firms may use more debt to keep managers under pressure. Therefore, both the trade-off and the agency cost theories predict that firm size and debt level should be positively related. Myers and Majluf (1984) find that firms tend to issue equity when information asymmetry is the lowest. Nevertheless, large firms also have more assets, and thus the adverse selection may be a more important phenomenon if it impinges on a significantly larger base (Frank and Goyal, 2008). Since the lack of inside information is a serious problem in the UAE, the issuing cost of equity is in general high in this market. Therefore, large firms usually rely more on debt instead of equity to avoid high asymmetric information cost. As a result, the pecking order prediction about the relationship between firm size and leverage should also be positive.

#### 4.3.2. Profitability

Profitable UAE firms are less likely to go bankrupt and therefore they have lower expected bankruptcy costs. Following the trade-off theory, there should be a positive relationship between profitability and firm's borrowing. Further, according to the agency cost theory, firms with high profits should borrow more in order to prevent the possibility of expropriation of excessive internal resources by managers. As a result, the positive relationship between the firm's profitability and leverage supports the agency cost theory as well. Finally, profitable firms prioritize their financing needs by using their retained earnings first and then other external sources of funds, which coincides with the pecking order theory. In that case, profitable firms may use less debt. Therefore, a negative relationship between profitability and debt can be expected under the pecking order theory.

#### **4.3.3. Collateral**

A large amount of tangible assets allows firms to issue secured debts as it protects the lender against the default of the borrower or any type of financial distress. From the trade-off theory perspective, firms that have more tangible assets should have more secured long-term debt. Further, managers usually need to disclose sufficient information about their assets to lenders before borrowing against collateral. This improves a company's level of transparency to creditors and thereby we should expect low agency cost of debt in the case of firms with sufficient tangible assets. As such, both the trade-off and the agency cost theories predict a positive relationship between debt and collateral. Under the pecking order, Harris and Raviv (1991) argue that the low level of information asymmetry associated with tangible assets makes issuing equity less costly. However, firm-level information is not widely available to outside investors in the UAE due to low level of corporate transparency and poor quality of financial auditing, in general. This causes equity issuances costly, and thus firms in UAE usually prefer debt to equity. According to the pecking order theory, we therefore expect a positive relationship between the size of collateral and leverage.

#### **4.3.4. Growth**

Myers (1977) argues that firms with an incentive to take risks to grow results in an increase of financial distress. Because of high distress cost, corporate managers might face difficulties to raise sufficient funds from the credit market. Accordingly, the trade-off theory predicts a negative relationship between growth and a firm's debt level. Previous studies, such as Barclay, Smith, and Watts (1995) and Rajan and Zingales (1995), find similar evidence. This finding is also consistent with the agency cost theory as Jensen (1986) argues that the agency cost of free cash flows are less severe to growing firms resulting in fewer debts. Conversely, the pecking order theory predicts that when the internal generated funds are mostly utilized, firms raise debts. Kremp, Stöss, and Gerdesmeier (1999), for instance, find that assuming the profitability level fixed, firms with high growth opportunities accumulate more debt over time. Therefore, a positive relationship between firm growth and debt is likely under the pecking order theory.

#### **4.3.5. Liquidity**

Firms with high liquidity are subject to low bankruptcy costs and therefore they are able to raise sufficient debts from financial institutions. According to the trade-off theory, we can expect a positive relationship between a firm's liquidity and debt. Similarly, managers in high liquid firms might hoard cash and invest it in several negative valued projects. As a result firms need to borrow more debt to prevent such agency problems between managers and equity holders. The agency cost theory therefore also suggests a positive relationship between liquidity and firm's debt. Nevertheless, according to the pecking order theory, firms with high liquidity will borrow less and refrain to a certain extent from utilizing bank loans to finance their operating activities. Thus we assume that there exists a negative relationship between liquidity and debt under the pecking order theory.

#### **4.3.6. Government Share**

The UAE government is a major shareholder of several publicly-listed companies. Their presence in the board room gives strong confidence to lenders, and that also minimizes the chance of

bankruptcy as the government can easily protect the firm from any future financial distress. Due to low default risk, firms with government ownership might be able to borrow more debts from the credit market. As a result, we can expect a positive relationship between government share and a firm's debt level according to the trade-off theory. In the UAE, the government usually consists of individual members of the ruling family, who are also the rulers and key policymakers of the country. Therefore, government-owned business entities are in general more transparent and accountable to their stakeholders than other publicly listed companies. Following the agency cost theory, we therefore assume that firms with government shares are not required to use large amount of debt to minimize potential agency conflicts between managers and shareholders of those companies. Finally, the publicly-listed companies with government ownership enjoy several exemptions, cash grants and other incentives from the government in different forms (e.g., cash, land, utility bills) within the government's endeavor to diversify firms' own resources into different industrial bases in favor of economic development of the country. This provides adequate funds to respective firms for financing their daily working capital requirements and any new project, resulting in low necessity of borrowing from financial institutions. As such, we expect a negative relationship between government share and bank borrowing under the pecking order theory.

Based on the above discussion, we therefore predict the following signs corresponding to each explanatory variable of the model under different capital structure theories:

<i>Independent Variables</i>	<i>Trade-off theory</i>	<i>Agency cost theory</i>	<i>Pecking order theory</i>
<i>SIZE</i>	+	+	+
<i>PR</i>	+	+	-
<i>COLL</i>	+	+	+
<i>GR</i>	-	-	+
<i>LIQ</i>	+	+	-
<i>GOVTSH</i>	+	-	-

We determine the relevance of one of these three theories in the context of UAE firms by examining the estimated sign of each variable of our empirical model. For instance, the pecking order theory should be relevant for the publicly-listed UAE companies if the estimated model exhibits the same sign corresponding to each variable as stated under the pecking order theory. In the following section, we discuss our findings and accordingly determine the appropriateness of individual theories in capital structure decision of UAE companies.

## 5. RESULTS AND DISCUSSION

We report summary statistics and the correlation matrix of both dependent and explanatory variables in Table 1. Three critical points are noteworthy. First, the average size of total borrowing by sample firms is 17% (14%) of their total capital (assets). We also observe that the sample firms are on average large and highly liquid companies. Further, they are growth-oriented (29% on average), but less profitable business entities (6% on average). Second, all three proxy measures of leverage are highly and positively correlated with each another (i.e., the correlation ranges between 0.81 and 0.87). We therefore use each variable in our regression model one at a time.

Finally, we find that while firm size, collateral, and government ownership are positively correlated with firm's total debt, there is a negative correlation between liquidity and leverage. Though these correlations support the predicted relationships between leverage and other determinants under the pecking order theory, it is not possible to determine which theory of capital structure works well in the case of UAE companies unless we control for all factors in our regression model at the same time.

**Table 1A**  
**Summary Statistics**

<i>Variables</i>	<i>Mean</i>	<i>Median</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
<i>LTDCAP</i>	0.10	0.00	0.17	0.00	0.88
<i>TDCAP</i>	0.17	0.08	0.20	0.00	0.91
<i>TDASSET</i>	0.14	0.06	0.22	0.00	2.27
<i>SIZE</i>	5.34	5.36	0.75	3.66	7.40
<i>PR</i>	0.06	0.06	0.07	-0.21	0.33
<i>COLL</i>	0.29	0.28	0.20	0.00	0.78
<i>GR</i>	0.29	0.17	0.50	-0.64	3.45
<i>LIQD</i>	4.64	2.17	7.31	0.20	64.17

**Table 1B**  
**Correlation Matrix**

	<i>LTDCAP</i>	<i>TDCAP</i>	<i>TDASSET</i>	<i>SIZE</i>	<i>PR</i>	<i>COLL</i>	<i>GR</i>	<i>LIQD</i>	<i>GS</i>
<i>LTDCAP</i>	1.00								
<i>TDCAP</i>	0.87***	1.00							
<i>TDASEET</i>	0.81***	0.83***	1.00						
<i>SIZE</i>	0.43***	0.42***	0.32***	1.00					
<i>PR</i>	0.03	0.01	0.03	0.31***	1.00				
<i>COLL</i>	0.28***	0.23***	0.15**	0.03	0.19***	1.00			
<i>GR</i>	0.08	0.11*	0.09	0.17***	0.07	-0.09	1.00		
<i>LIQD</i>	-0.18**	-0.31***	-0.23***	-0.27***	-0.30***	-0.22***	0.16***	1.00	
<i>GOVTSH</i>	0.16**	0.13**	0.13***	0.14**	0.13**	0.14**	0.02	-0.08	1.00

*Notes:* Correlation matrix is calculated using an unbalanced panel data set. Variables include the ratio of total long-term debt to capital (*LTDCAP*), the ratio of total debt to capital (*TDCAP*), and the ratio of total debt to total assets (*TDASSET*), firm's size (*SIZE*), profitability at the beginning of the year (*PR*), firm's tangible assets at the beginning of the year (*COLL*), firm's current growth in assets (*GR*), current short-term liquidity (*LIQD*), and government ownership in firms (*GOVTSH*).

In Table 2, we report the estimated coefficients of our empirical model. The results in column I, II, and III are based on three different measures of capital structure including the ratio of long-term debt to capital, the ratio of total debt to capital, and the ratio of total debt to assets, respectively. Regardless of different estimates of debt level, the relationship of each determinant with firm's leverage remains robust in three model estimations. We find that firm size is positively correlated with leverage. For example, the coefficient of *SIZE* in column (I) is 0.05, indicating that large UAE firms usually borrow more from the financial institutions. This result is in line with our assumption that big companies have lower debt cost than small firms due to low probability of bankruptcy. Further, the availability of information is limited in this market, and thereby it is convenient for large firms to secure more debts instead of equity. We also find that

firms with more tangible assets are highly borrowed firms in the UAE. As an example, the estimated coefficient of *COLL* varies from 0.13 in column (III) to 0.21 in column (I), suggesting that such firms usually borrow more by keeping their physical assets as collaterals to individual lenders. Further, high growth firms exhibit the tendency of high borrowing in the UAE. As is evident in column I (II), the estimated coefficient of *GR* is 0.03 (0.06), indicating that a 1% rise in growth results in a significant increase in total borrowing by 3% (6%) of firm's total capital in the UAE. Though the coefficient of *GR* is insignificant in the case of *TDASSET* (refer to column III), the sign of the marginal effect remains the same as found in other two cases. The positive sign of *GR* is in fact attributed to the pecking order theory, which states that growth-oriented UAE firms issue more debts as their internal resources are quickly exhausted in financing several projects. This evidence is indeed consistent with the finding in Kester (1986).

In contrast, we find that firms borrow less money from credit markets as their profitability and liquidity increase. For instance, the coefficients of *PR* and *LIQD* in column II are -0.62 and -0.01, respectively, significant at the 1% level. This implies that a 1% increase in profitability and liquidity result in a decrease in total debt outstanding by 62% and 1% of total capital, respectively, in the case of UAE firms. Between them, profitability has indeed a significantly large impact on firm's borrowing decision. Such evidence coincides with Booth, Aivazian, Demircug-kunt, and Maksimovic (2001), recommending that firms in emerging countries tend to rely more on their internally generated funds due to high information asymmetry problem. Given that the UAE financial market is still not that efficient to retrieve adequate firm-level information, the cost of borrowing is high because of high information cost that is ultimately imposed to individual borrowers. This finding also goes along with our prediction based on the pecking order theory that profitable and highly liquid firms usually prefer to use their own resources to avoid such high borrowing cost. Finally, we find that government ownership does not have any significant effect on a firm's borrowing decision. Though the coefficient of *GOVTSH* is found insignificant, the positive sign of the coefficient indicates that government ownership provides easy accessibility to firms for raising funds from the credit market. Such evidence is consistent with the finding of Al-Sakran (2001) who also reports a positive relationship between government and debt in Saudi Arabia. Additionally, we find that the bank borrowing of individual firms did not change significantly during the crisis period compared to that in the boom period in the UAE. In contrast, we find significant differences in bank borrowing across individual industries. For example, the estimated results suggest that the industries like energy & petroleum, real estate & construction, and tourism & services have significantly high amount of debt than the manufacturing sector of the UAE. As shown in column I, the estimated coefficients of *GAS-PETRO*, *RES-CONS*, and *TOUR-SERV* are 0.44, 0.08, and 0.09, respectively, significant at the 1% level. Overall, the predicted effects of the explanatory variables on total leverage of UAE firms, except the government ownership, are consistent with the expected relationship under the pecking order theory. This finding indeed suggests that UAE firms prefer internal to external sources of financing in general. This evidence is not unlikely given the fact that the quality and quantity of corporate disclosure as well as the practice of corporate governance are still limited in the UAE, which makes external funds costlier than internal funds for the publicly-listed UAE firms.

**Table 2**  
**Determinants of Capital Structure**

Independent Variables	Dependent Variables		
	(I) LTDCAP	(II) TDCAP	(III) TDASSET
<i>Intercept</i>	-0.26*** (-3.25)	-0.21** (-1.99)	-0.18 (-1.37)
<i>SIZE<sub>it</sub></i>	0.05*** (3.04)	0.06*** (2.94)	0.05** (1.93)
<i>PR<sub>it</sub></i>	-0.43*** (-3.09)	-0.62*** (-3.35)	-0.45** (-1.91)
<i>COLL<sub>it</sub></i>	0.21*** (4.44)	0.19*** (2.98)	0.13* (1.70)
<i>GR<sub>it</sub></i>	0.03* (1.66)	0.06** (2.51)	0.05 (1.52)
<i>LIQD<sub>it</sub></i>	-0.003** (-2.17)	-0.01*** (-4.38)	-0.01*** (-2.84)
<i>GOVTSH<sub>it</sub></i>	0.01 (0.42)	0.01 (0.46)	0.02 (0.75)
<i>CRISIS</i>	0.03 (1.40)	0.04 (1.55)	0.01 (0.40)
<i>ENG-PETRO</i>	0.44*** (6.96)	0.34*** (4.07)	0.31*** (2.89)
<i>RES-CONS</i>	0.08*** (3.34)	0.05* (1.82)	0.06* (1.67)
<i>TOUR-SERV</i>	0.09*** (3.35)	0.03 (0.96)	0.05 (1.05)
<i>N</i>	196	196	196
<i># of Firms</i>	37	37	37
<i>R<sup>2</sup></i>	0.46	0.37	0.20
<i>F-STAT</i>	23.96***	28.22***	12.37***

*Notes:* The dependent variables are the ratio of total long-term debt to capital (*LTDCAP*), the ratio of total debt to capital (*TDCAP*), and the ratio of total debt to total assets (*TDASSET*). Total capital is equal to book value of total debt plus total equity of individual sample firms. Independent variables include firm's size (*SIZE*), profitability at the beginning of the year (*PR<sub>it-1</sub>*), firm's tangible assets at the beginning of the year (*COLL<sub>it-1</sub>*), firm's current growth in assets (*GR<sub>it</sub>*), current short-term liquidity (*LIQD<sub>it</sub>*), and government ownership in firms (*GOVTSH*). *CRISIS* is a dummy variable that is equal to 1 if a sample year belongs to the period 2008-2009, 0 otherwise. Industry dummy variables are gas & petroleum (*GAS-PETRO*), real-estate & construction (*RES-CONS*), and tourism & services (*TOUR-SERV*) industries. The coefficients are estimated by applying the fixed-effect panel regression method, using an unbalanced panel data set clustered by firm. *t*-statistics are given in the parentheses. \*\*\*, \*\* and \* imply the significance of each coefficient at the 1%, 5%, and 10% level, respectively.

We report the estimated results for the boom and crisis periods separately in Table 3. We find that the marginal effect of each determinant of capital structure is consistent with the earlier findings in both economic conditions. In particular, while firm size, collateral, and growth are positively correlated with leverage, firm's liquidity and profitability are negatively related with total borrowing by firms. Though we find insignificant coefficients in some instances, the

predicted signs of those coefficients support the above relationships in general. Such evidence is also similar to the predicted effects of each determinant under the pecking order theory. This repeatedly suggests that UAE firms prefer to utilize their own resources first before raising additional funds from external sources. Generally, our findings suggest that the bank borrowing decisions of UAE firms remain unchanged regardless of any significant change in the financial market.

**Table 3**  
**Determinants of Capital Structure in Boom and Crisis Periods**

Independent Variables	Boom Period (2001-2007)			Crisis Period (2008-2009)		
	(I) LTDCAP	(II) TDCAP	(III) TDASSET	(IV) LTDCAP	(V) TDCAP	(VI) TDASSET
<i>Intercept</i>	-0.19* (-1.86)	-0.14 (-0.98)	-0.19 (-0.92)	-0.33** (-2.47)	-0.22 (-1.20)	-0.11 (-0.73)
<i>SIZE<sub>it</sub></i>	0.04* (1.87)	0.05* (1.74)	0.05 (1.31)	0.06** (2.31)	0.06** (1.96)	0.04 (1.29)
<i>PR<sub>it</sub></i>	-0.32* (-1.82)	-0.40* (-1.68)	-0.29 (-0.83)	-0.61*** (-2.72)	-0.89*** (-2.87)	-0.71*** (-2.73)
<i>COLL<sub>it</sub></i>	0.10* (1.70)	0.08 (1.05)	0.02 (0.13)	0.44*** (5.51)	0.39*** (3.52)	0.36*** (3.92)
<i>GR<sub>it</sub></i>	0.03 (1.41)	0.06** (2.36)	0.05 (1.29)	0.06 (1.42)	0.08 (1.47)	0.04 (0.78)
<i>LIQD<sub>it</sub></i>	-0.003* (-1.82)	-0.01*** (-3.24)	-0.01* (-1.90)	-0.001 (0.42)	-0.01** (-2.22)	-0.01** (-2.04)
<i>GOVTSH<sub>it</sub></i>	0.02 (0.81)	0.03 (1.07)	0.06 (1.18)	-0.003 (-0.11)	-0.01 (-0.20)	-0.01 (-0.27)
<i>ENG-PETRO</i>	0.65*** (5.07)	0.61*** (3.52)	0.51** (2.02)	0.34*** (4.52)	0.24** (2.33)	0.24*** (2.72)
<i>RES-CONS</i>	0.06** (2.07)	0.02 (0.51)	0.04 (0.71)	0.10*** (2.83)	0.10** (1.99)	0.09** (2.12)
<i>TOUR-SERV</i>	0.10*** (2.99)	0.05 (1.02)	0.05 (0.72)	0.04 (0.95)	-0.02 (-0.43)	0.02 (0.39)
<i>N</i>	125	125	125	71	71	71
<i># of Firms</i>	34	34	34	36	36	36
<i>R<sup>2</sup></i>	0.35	0.30	0.15	0.66	0.53	0.51
<i>F-STAT</i>	10.56***	14.69***	5.55***	19.62***	18.55***	16.31***

*Notes:* The dependent variables are the ratio of total long-term debt to capital (*LTDCAP*), the ratio of total debt to capital (*TDCAP*), and the ratio of total debt to total assets (*TDASSET*). Total capital is equal to book value of total debt plus total equity of individual sample firms. Independent variables include firm's size (*SIZE*), profitability at the beginning of the year (*PR<sub>it</sub>*), firm's tangible assets at the beginning of the year (*COLL<sub>it</sub>*), firm's current growth in assets (*GR<sub>it</sub>*), current short-term liquidity (*LIQD<sub>it</sub>*), and government ownership in firms (*GOVTSH*). We consider both 2008 and 2009 as two crisis years in the UAE economy. Industry dummy variables are gas and petroleum (*GAS-PETRO*), real-estate and construction (*RES-CONS*), and tourism and service (*TOUR-SERV*) industries. The coefficients are estimated by applying the fixed-effect panel regression method, using an unbalanced panel data set clustered by firm. *t*-statistics are given in the parentheses. \*\*\*, \*\* and \* imply the significance of each coefficient at the 1%, 5%, and 10% level, respectively.

## 6. CONCLUSION

The purpose of this study is to investigate the applicability of capital structure theories in the context of the publicly-listed companies in the United Arab Emirates (UAE) during the period 2001-2009. We examine this issue by identifying the relationships of individual determinants with firm's leverage, which should coincide with the predictions corresponding to a specific capital structure theory. We find that firm size is positively correlated with leverage, and firms with more tangible assets are usually high leveraged firms. Further, firms borrow less money from credit markets as their profitability and liquidity increase. Though we do not find any significant impact of government ownership on firm's capital structure decision, overall the predicted effects of the explanatory variables on total leverage of UAE firms are consistent with the propositions of the pecking order theory. This finding therefore suggests that publicly-listed companies in the UAE prefer internal to external funds to finance their new projects.

When the boom and crisis periods are compared, the findings are found to be consistent with those already reported. This further supports the notion that the publicly-listed UAE firms prefer to utilize their own resources first before raising additional funds from external sources even in the crisis period, and the capital structure decisions of these firms remain unchanged regardless of any significant change in the economy. This evidence conveys an important message for both foreign and local private companies in the UAE. It recommends the management of these companies to emphasize more on generating funds from their own businesses so that they can remain competitive compared with other publicly-listed UAE companies in the same industry.

### *Notes*

1. Those countries include Brazil, India, Jordan, Korea, Malaysia, Mexico, Pakistan, Thailand, Turkey, and Zimbabwe.

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