# *Capital Structure and Market Power: Evidence from Jordanian Banks*

Faris Nasif Al-Shubiri

This paper provides new insights into the way in which the capital structure and market power and capital structure and profitability are related. We used sample data of fourteen banks listed on the Amman Stock Exchange for the period from 2005 to 2008. We examine the dependent variable, which are expressed by total debt deflated by total assets, while the independent variables are Tobin *Q*, Growth, Profitability, Size, Ownership, Risk and Tangibility ratio. The OLS estimation results indicate that, at lower and higher ranges of Tobin's *Q*, banks employ higher debt, and reduce their debt at intermediate range. This is due to the complex interaction of market conditions, agency costs, and bankruptcy costs. We also show the saucer-shaped relation between capital structure and profitability because of the interplay of agency costs, costs of external financing and interest tax-shield. We find that size tangibility variables have a positive influence both on capital structure and on the other hand on growth, while risk and ownership variables have a negative influence on capital structure.

*Key Words:* knowledge, competitiveness, firm performance, knowledge-based theory
JEL *Classification:* G30, G21, G28

## Introduction

Capital structure decisions are crucial for the financial wellbeing of the firm. Financial distress, liquidation and bankruptcy are the ultimate consequences laying ahead if any major misjudgment occurred following any financing decision of the firm's activity. One of the strategies a firm should look into is to lower the weighted cost of capital. This will increase net economic return, which eventually increases the firm's value. Hence, maximizing the firm's value is the focal point for every financing decision made by the management of the company. The management of the firm operating in the very uncertain world has a tough task ahead in achieving the best capital structure.

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However, the key to choosing an appropriate and acceptable level of financial leverage is still debatable by the top management of a firm. Many theories and much empirical evidence in providing optimal capital structure exist in the real world. Yet, this is still a cloudy area and with no specific guidelines to assist financial officers in attaining an efficient mixture of debt and equity. Thus, only clues and calculated judgment plus some understanding of financial theory are possible tools to be applied in facilitating how the financing mix affects the firm's value and its stock price.

There are some studies that provide evidence on the capital structure determinants from the emerging markets of South-east Asia (Pandey 2001; Pandey et al. 2000; Annuar and Shamsher 1993; Ariff 1998). The focus of corporate finance empirical literature has been to identify some 'stylised' factors that determine capital structure. Modigliani and Miller (1958) initiated the theory of capital structure in their influential seminal work on the effects of capital structure on the firm's value. They demonstrate and finally conclude that the 'capital structure is an irrelevance' in a perfect financial market, considering the no-tax case in the 'pie model,' which literally means that the firm's value is independent of its financing or financial structure. They argue that the size of the pie does not depend on how it is sliced, but depends only on the level and risk of its future cash flows. Modigliani and Miller (1963) even illustrate how firms should utilize 'all' debt financing, because interest is deductible for tax purpose. This 'tax shield' allows firms to pay lower taxes than they should if equity financing is used, thus attaining optimal capital structure through tax saving. Surprisingly, despite all the criticism and controversial issues arising from the M&M proposition, the empirical work by Hatfield, Cheng, and Davidson (1994) supports the M&M theorem. As time moved on, and with recent developments in the corporate world, more researches have examined in greater depth the concept of capital structure.

The trade-off theory of capital structure comes at a later stage, which is concerned about the corporate finance choices of firms, and is widely discussed. Its rationale is to describe the fact that firms are usually financed by some proportion of debt and equity. It proposes the principle that a firm's target leverage is driven by tax-shields, bankruptcy costs of debt and agency conflicts. Under the trade-off theory, it affirms the advantages of using debt because the firm can gain a tax shield by using some proportion of debt in financing the company. The tax shield comes

from the interest payment as a tax deductible item, which means that the higher the interest payment on debt employed, the lower will be the taxes paid by the firm. However, as companies decide to use more debt, this will put companies in the position of financial distress due to the possibility of the firm being in default in meeting its liabilities obligations. Financial distress will include bankruptcy and non-bankruptcy cost. In conclusion, the trade-off theory suggests that optimal capital structure can be attained. However, firms should take appropriate actions in balancing between the tax benefits of higher debt and the greater possibility of financial distress costs, while aiming to optimize their overall value. Early empirical evidence on the trade-off theory by Bradley, Jarrel, and Kim (1984) reported mixed result.

Debt is an effective tool to lessen the agency costs, and eventually optimal capital structure can be derived from the balance between the costs of debt against the benefits of debt. In viewing the conflicts between shareholders and bondholders, covenants will protect the bondholders' position so that they can mitigate the risk of default payment. However, the agency costs only arise when the risk of defaults payment exists. Even though the agency costs of debt are burdensome, they are the solution towards obtaining external funds at a lower rate. The choice of capital structure brings signals to outside investors through the information of insiders. Ross (1977) assumes that managers (the insiders) know the true distribution of firms' returns, but investors do not. If managers decide to add more debt into capital structure, investors interpret this as a signal of high future cash flows and the firm is committed towards its contractual obligation. Thus, this will show a higher level of confidence that the management has towards the firm's prospect in the near future. However, if managers decide to finance the firm by issuing new equity, this signals that management is lacking in confidence towards future prospects of the firm. Accordingly, it concludes that investors take larger levels of debt as a signal of higher quality and that profitability and leverage are thus positively related. The first and foremost purpose of the present study is to determine the relationship between capital structure and market power. This will clarify the extent of optimal debt and equity used in financing the firms' activity in emerging markets, such as the Jordanian one. This study explains the relation between capital structure and market structure and the relation between capital structure and profitability, and also sheds light on the Jordanian capital structure area and how to lead the financial managers in determining the right choices in the capital structure

policy in the future. The main hypotheses of this study can be developed:

H1 *There is no statistically significant effect of Tobin Q on capital structure.*

H2 *There is no statistically significant effect of profitability on capital structure.*

H3 *There is no statistically significant effect of growth on capital structure.*

H4 *There is no statistically significant effect of unsystematic risk on capital structure,*

H5 *There is no statistically significant effect of asset size on capital structure.*

H6 *There is no statistically significant effect of tangibility on capital structure.*

H7 *There is no statistically significant effect of ownership on capital structure.*

The remaining sections of the paper are organized as follows: the second provides the theoretical framework, the third section presents a review of empirical studies, the fourth section describes data and research methodology, the fifth section reports on the results of the statistical analyses, and the last summarizes the main conclusions and recommendations of the study.

## Theoretical Framework

### THEORIES OF CAPITAL STRUCTURE

Modigliani and Miller (1958) initiated the theory of capital structure in their influential seminal work on the effects of capital structure on the firm's value. They demonstrate and finally conclude that the 'capital structure is an irrelevance' in a perfect financial market, considering the no-tax case in the 'pie model,' which literally means that the firm's value is independent of its financing or financial structure. They argue that the size of the pie does not depend on how it is sliced, but depends only on the level and risk of its future cash flows.

Hatfield, Cheng, and Davidson (1994) support the M&M theorem. As time has moved on,and with recent developments in the corporate world, more researches have examined more deeply the concept of capital structure. The trade-off theory of capital structure comes at a later stage, which is concerned about the corporate finance choices of firms and is widely discussed. Its rationale is to describe the fact that firms are

usually financed by some proportion of debt and equity. It proposes the principle that a firm's target leverage is driven by tax shields, bankruptcy costs of debt and agency conflicts.

Agency cost is also an important issue in determining the capital structure of a firm. It arises due to the conflict of interest between shareholders and managers, or between shareholders and bondholder managers, who are given the authority by the shareholders to manage the firm, on the assumption that managers will act in the interest of the firm's welfare and shareholders' benefits (Jensen and Meckling 1976). However, the agency costs only arise when the risk of defaults payment exists. Even though the agency costs of debt are burdensome, they are the solution towards obtaining external funds at a lower rate. The choice of capital structure brings signals to outside investors through the information of insiders. Ross (1977) assumes that managers (the insiders) know the true distribution of the firm's returns, but investors do not. If managers decide to add more debt into the capital structure, investors interpret this as a signal of high future cash flows, and the firm is committed towards its contractual obligation. Thus, this will show the higher-level of confidence the management has towards the firm's prospects in the near future.

However, if managers decide to finance the firm by issuing new equity, this signals that management is lacking in confidence towards the future prospects of the firm. Accordingly, it concludes that the investors take larger levels of debt as a signal of higher quality, and that profitability and leverage are thus positively related.

The Pecking Order theory was first initiated by Myers (1984) and Myers and Majluf (1984). The theory tries to capture the costs of asymmetric information and assumes that the management of the company knows more about the future prospects of the firms than do outsiders. It makes the announcement to issue debt or equity meaningful to outsiders, as it is a signal of management prospects in the future. The market will give a positive reaction if the company starts to buyback its shares. To sum up, the pecking order theory tries to generate ideas that firms will use the hierarchy of financing. Firstly, they will tend to use internal funds, otherwise, if not adequate, they will finance with external funds and with debt. That will make equity for the last resort in financing the capital structure of the company.

### BANKS AND CAPITAL STRUCTURE

The standard competitive paradigm, that less competition leads to market power (Bain 1956), may not be appropriate for the banking indus-

try. Due to the asymmetric information inherent in bank lending, banking competition may have a 'special nature.' Stiglitz and Weiss (1981) show that asymmetric information may cause credit rationing. However, Bester (1985) contests this result and suggests that credit-rationing problems can be circumvented when banks compete by choosing collateral requirements and using the interest rate to screen the risk to borrowers. Furthermore, De Meza and Webb (2007) state that the conditions needed for credit rationing to occur are too stringent. This suggests that, irrespective of the market structure, rationing can occur. Banks face an adverse selection problem and have to screen firms when they give loans. Conditional on the outcome of this screening, banks compete with each other by setting a loan rate. This procedure reduces the adverse selection problem, but it does not completely eliminate it if the screening tests are imperfect (Broecker 1990). Price competition and independent test procedures create a negative externality. Setting a higher loan rate than competitors produces two opposite effects on the profit of the deviating bank.

On the one hand, higher lending rates increase profits.On the other hand, they worsen the quality of firms accepting the loan, thus reducing profits. A firm will accept the least favorable loan rate only after being rejected by all other banks setting more favorable rates; but this implies that the firm has a low credit-worthiness on average. Because of this 'winner's curse' problem, increasing the number of banks performing screening tests decreases the average creditworthiness of firms, and increases the probability that a bank does not grant any loan. Consequently, equilibrium loan rates converge to oligopolist levels and banks end up making positive profits even with pure price competition. This implies that less bank market concentration may lead to high interest rates and less firm financing from banks

Petersen and Rajan (1995) investigate the effect of competition between banks on the availability of bank credit to firms. The Petersen and Rajan model shows how especially firms with uncertain future cash flows are negatively affected by competition between banks. Banks may be unwilling to invest in relationships by incurring initial losses that may never be recouped in the future (as firms can later on obtain a low loan rate in a competitive banking or financial market). Marquez (2002) also finds that more low-quality borrowers obtain financing, and banks may have to increase loan rates to compensate for the higher portfolio risk, thus leading to an inverse relationship between competition and the level of

loan rates. This result may not obtain any longer, however, when information acquisition is endogenous.

In such a context, competition lowers loan rates, in the usual way. Hauswald and Marquez (2005) show that when banks acquire information to soften competition and increase market shares, a higher number of banks reduces the winner's curse problem originating from competitors' superior information, thus leading to lower loan rates. In other words, an increase in the number of competing banks reduces the degree of product differentiation among banks, and thus loan rates. Furthermore, the theoretical literature has identified several problems with relationship banking. There is potential for a hold-up problem (Sharpe 1990; Rajan 1992), whereby a relationship bank may use the superior private information it possesses about the firm in order to extract rents. As a result, theory offers contradicting predictions on the relationship between bank market structure and firms' capital structure. Therefore we distinguish between two hypotheses: the information-based hypothesis and the market power hypothesis.

### Review of Empirical Studies

There are a few empirical studies that have investigated the issue of capital structure and market structure using data of the US firms. In these studies, market structure has been measured either in terms of price or quantity data or the Lerner index or the Herfindahl-Hirschman index, or Tobin's *Q*. Krishnaswamy, Mangla, and Rathinasamy (1992) find a positive relation between debt and market structure, measured by the Lerner index. Chevalier (1993) provides evidence in support of a negative relation between capital structure and market structure. This result is consistent with bankruptcy costs or the asymmetric information/pecking order hypotheses. Phillips (1995), using price and quantity data for market structure, finds a positive link between capital structure and market structure, consistent with the output and limited liability effect model. In a study of international firms from forty-nine countries, Rathnasamy, Krishnaswamy, and Mantripragada (2000) also report a positive relation between capital structure, measured by total debt ratio and long-term ratio and market structure measured by Tobin's *Q*. Their finding supports the output and limited liability effect and agency theoretic risk-shifting model of capital structure and product market interaction. The results also provide support for the free cash flow model of Jensen (1986), in the form of a positive relation between capital structure and profitability.

In empirical studies of determinants of capital structure, the Tobin *Q* ratio has also been used as a proxy for future investment opportunities. These studies show mixed results. A number of studies confirm a negative relationship between *Q* ratio and debt ratio (Titman and Wessels 1988; Barclay et al. 1995; Lasfer 1995; Rajan and Zingales 1995; Barclay and Smith 1996), while some find a positive relation (Michaelas et al. 1999).

Faulkender and Petersen (2006, henceforth FP) argue that information asymmetry and investment distortions are the market frictions that make capital structure choices relevant, but also imply that firms are sometimes rationed by their lenders. Thus, when estimating a firm's leverage, it is important to include not only the determinants of its preferred leverage (the demand side) but also the variables that measure the constraints on a firm's ability to increase its leverage (the supply side).

Pratomo and Ismail (2006), study the Islamic bank performance and capital structure based on 15 Malaysia Islamic Banks' Annual Report from 1997 until 2004. They consider the choice between debt and equity financing that has been directed to seek the optimal capital structure. Under the agency costs hypothesis, a high leverage tends to have an optimal capital structure and therefore it leads to producing a good performance, while the Modigliani-Miller theorem proves that it has no effect on the value of the firm. The importance of these issues has only motivated researches to examine the presence of agency costs in the non-financial firms. In financial firms, agency costs may also be particularly large because banks are by their very nature informationally opaque – holding private information on their loan customers and other credit counterparties. In addition, there are regulators that set minimums for equity capital and other types of regulatory capital in order to deter excessive risk taking and perhaps affecting agency cost hypothesis of Islamic Banks in Malaysia, under which a high leverage firm tends to reduce the agency costs. They set the profit efficiency of a bank as an indicator of reducing agency costs and the ratio equity of a bank as an indicator of leverage. Their findings are consistent with the agency hypothesis. The higher leverage or a lower equity capital ratio is associated with higher profit efficiency.

Pandey (2004) examines the relationship between capital structure and market structure using data from 208 Malaysian companies for the period from 1994 to 2000. This study provides new insights into the way in which capital structure and market power and capital structure and profitability are related. Capital structure and market power, as measured

by Tobin's *Q*, are shown to have a cubic relationship, due to the complex interaction of market conditions, agency problems and bankruptcy costs. The study finds a saucer-shaped relation between capital structure and profitability, due to the interplay of agency costs, costs of external financing and debt tax shield

Bevan and Danbolt (2004) analyze the determinants of the capital structure of 1,054 UK companies from 1991 to 1997, and the extent to which the influence of these determinants is affected by time-invariant firm-specific heterogeneity. Comparing the results of pooled OLS and fixed effects panel estimation, they find significant differences in the results. While their OLS results are generally consistent with the prior literature, the results of their fixed effects panel estimation contradict many of the traditional theories of the determinants of corporate financial structure. This suggests that the results of traditional studies may be biased owing to a failure to control for firm-specific, time-invariant heterogeneity.

Drobetz and Fix (2003) have tested leverage predictions of the trade-off and pecking order models using Swiss data. At an aggregate level, the leverage of Swiss firms is comparatively low, but the results depend crucially on the exact definition of leverage. By confirming the pecking order model but contradicting the trade-off model, more profitable firms use less leverage. Firms with more investment opportunities apply less leverage, which supports both the trade-off model and a complex version of the pecking order model. Leverage is very closely related to the tangibility of assets and the volatility of a firm's earnings. Finally, estimating a dynamic panel model, they find that Swiss firms tend to maintain the target leverage ratio. Their findings are robust for several alternative estimation techniques

## Data and Methodology

The sample data used in the study are for the four year period from 2005 through 2008. We exclude the fourteen banks whichtraded the stock of bank on the Amman Stock Exchange (ASE). The data for the empirical analysis were derived from the financial statements of these banks.

The estimation equation is as follows:

$$(\mathrm{TD/A})_{i,t} = \alpha_0 + \alpha_1 Q_{i,t} + \alpha_2(\mathrm{EBIT/A}) + \alpha_3 \mathrm{GA}_{i,t} + \alpha_4 \beta_{i,t} + \alpha_5 \log \mathrm{A}_{i,t} + \alpha_6 \mathrm{TAN}_{i,t} + \alpha_7 \mathrm{OWS}_{i,t} + \alpha_{i,t}.$$

Total debt-to-asset ratio (TD/A) at book value is our dependent variable. Independent variables include *Q* ratio, profitability, growth, unsystematic risk, size, ownership (number of shares) and tangibility. *Q* is calculated as the sum of the market value of equity and book value of long-term debt and net current assets (current assets minus current liabilities). Growth (GA) is measured as one plus annual change in assets. Profitability (EBIT/A) is defined as earnings before interest and taxes divided by assets or capital. Risk is defined as systematic risk, and it is measured by unlevered beta. Beta for each firm is calculated using the weekly share price data. The calculated beta for each company is unlevered for its level of leverage. Size is measured as the natural log of assets. Ownership (OWS) is measured by the natural log of the number of outstanding shares. It is assumed that a larger number of shares implies diffused ownership. Tangibility (TAN) is defined as fixed assets divided by assets.

The relationship between firm profitability and capital structure can be explained by the pecking order theory (POT), which holds that firms prefer internal sources of finance to external sources. The order of the preference is from the one that is least sensitive (and least risky) to the one that is most sensitive (and most risky), which arises because of asymmetric information between corporate insiders and less well-informed market participants (Myers 2001). By this token, profitable firms with access to retained profits can rely on them as opposed to depending on outside sources (debt). Murinde et al. (2004) observe that retentions are the principal source of finance. Titman and Wessels (1988) agree that firms with high profit rates, all things being equal, would maintain relatively lower debt ratios since they are able to generate such funds from internal sources.

Empirical evidence from previous studies seems to be consistent with the pecking order theory. Most studies found a negative relationship between profitability and capital structure. Hall et al. (2004) also suggest negative relationships between profitability and both long-term debt and short-term debt ratios.

Firm growth is likely to place a greater demand on internally generated funds and push the firm into borrowing (Hall et al. 2004). Firms with high growth will capture relatively higher debt ratios. In the case of small firms with more concentrated ownership, it is expected that high growth firms will require more external financing and should display higher leverage. (Heshmati 2001) maintain that growing SMEs appear more likely to use external finance – although it is difficult to determine

whether finance induces growth or the opposite (or both). As enterprises grow through different stages, i. e., micro, small, medium and large scale, they are also expected to shift financing sources.

They are first expected to move from internal sources to external sources. There is also a relationship between the degree of previous growth and future growth. Michaelas et al. (1999) argue that future opportunities will be positively related to leverage, in particular short term leverage.

Firm risk showing the level of risk is said to be one of the primary determinants of a firm's capital structure. The tax shelter-bankruptcy cost theory of capital structure determines a firm's optimal leverage as a function of business risk (Castanias 1983). Given agency and bankruptcy costs, there are incentives for the firm not to fully utilize the tax benefits of 100% debt within the static framework model.

The more likely a firm is exposed to such costs, the greater is their incentive to reduce their level of debt within its capital structure. One firm variable that affects this exposure is the firm's operating risk, in that the more volatile the firm's earnings stream, the greater is the chance of the firm defaulting and being exposed to such costs. According to Johnson (1997), firms with more volatile earnings growth may experience more situations in which cash flows are too low for debt service.

Despite the broad consensus that firm risk is an important determinant of corporate debt policy, empirical investigation has led to contradictory results. Esperança et al. (2003) found positive associations between firm risk and both long-term and short-term debt.

Berle and Means (1932) initially developed the agency theory, and they argued that there is an increase in the gap between ownership and control of large organizations arising from a decrease in equity ownership in theory, shareholders of a company are the only owners, and the duty of top management should be solely to ensure that shareholders interests' are met. In other words, the duty of top managers is to manage the company in such a way that returns to shareholders are maximized, thereby increasing the profit figures and cash flows (Elliot 2002)

The asset structure (Tangibility) of a firm plays a significant role in determining its capital structure. The degree to which the firm's assets are tangible should result in the firm having greater liquidation value (Titman and Wessels 1988). Bradley et al. (1984) assert that firms that invest heavily in tangible assets also have higher financial leverage since they borrow at lower interest rates if their debt is secured with such assets. It

is believed that debt may be more readily used if there are durable assets to serve as collateral (Wedig et al. 1988). It is further suggested that bank financing will depend upon whether the lending can be secured by tangible assets (Berger and Udell 1998).

Empirical evidence suggests a positive relationship consistent with theoretical argument between asset structure and leverage for the firms (Bradley et al. 1984) Wedig et al. (1988), however, found a significant and negative coefficient between depreciation expense as a percentage of total assets and financial leverage. Other studies specifically suggest a positive relationship between asset structure and long-term debt, and a negative relationship between asset structure and short-term debt.

**Data and Main Empirical Results**

The lengths of trade credit terms are directly related to market power, as more valuable customers can negotiate more generous credit terms with suppliers. In addition, banks with a greater market share can stretch the credit terms offered by suppliers with little repercussion, as contracts with industry leaders are critical to the viability of smaller suppliers. Similarly, strong relationships with vendors allow banks with greater market power to hold fewer inventories. Suppliers with more market power relative to customers can negotiate shorter terms with customers for at least two reasons.

First, the level of competition from rival banks is reduced for banks with a large market share, which decreases the likelihood of losing customers over a reduction in credit terms. Second, suppliers with a large market share are more likely to have forged longer relationships with clients, implying high costs of switching suppliers.

We define market structure in terms of the market power of banks. Market power means control of a bank over price or volume of production. In operational terms, market power implies a firm's monopoly, or oligopoly or competitive power. Rathnasamy, Krishnaswamy and Mantripragada (2000) state that market structure (power) could be measured by the Lerner index, or the Herfindahl-Hirschman index, or Tobin's *Q*. Lindenberg and Ross (1981) show that Tobin's *Q* (or simply *Q*) is a theoretically sound and practically the most powerful indicator of a firm's market power. In a competitive market, *Q* of all firms will be equal to one. Firms with *Q* higher than one are expected to command the competitive advantage, either oligopoly or monopoly power.

Hence, we define market power in terms of *Q*. There is also a practical

reason for using this definition of market power. In developing countries, price and quantity or segmental data are not available for measuring the Lerner index or the Herfindahl-Hirschman index. The theoretical definition of *Q* is the ratio of market value of the firm to replacement cost of assets. It is not easy to get replacement cost data in developing countries.

Table 1 provides means and standard deviations of the dependent and independent variables for each year from 2005 to 2008 and for the whole period. The average total debt ratio (TDR) for the period of 2005–2008 is .83. However, TDR has been steadily increasing over the years, ranging from .79 to .85 from 2005 to 2008. *Q* ratio has shown fluctuations during 2005–2008. It was lower in 2007 and 2008, corresponding with the financial and stock market crisis in Jordan, the results indicate 3.30–2.0–.83–1.57–2.25 respectively. Assets growth was quite high for the years from 2005–2008; but it showed a sharp decline in the last three years. Profitability also steadily declined significantly in 2006 and 2007.

Tables 2–6 provide correlation R for the sample of 15 banks. The results indicate that size and *Q* ratio have a significant positive relationship with total debt ratio, while risk (unlevered beta) and profitability EBIT/A have a significant negative relationship in year 2005, but in year 2006 the asset growths have a significant negative relationship. The negative relationship between risk and size implies that the large banks, being more diversified, have a lower systematic risk and also a negative significant relationship of profit and significant positive relationship of *Q* ratio. There is a positive significant relationship between size, and growth in year 2008 with total debt ratio, and negative with risk and tangibility.

Table 2 presents the results for 2005, and the main concern is to test the specification about the relationship between capital structure (total debt ratio) and market power. We find that there is a significant relationship between *Q* ratio, profitability and asset size at significant level 10% (sig. .09, *t*-test 1.824), 1% (sig. .000, *t*-test –5.016) and 5% (sig. .032, *t*-test 2.397) respectively, and the results indicate that the total independent variables are at a significant level of 5% (sig. .019, *F*-test .019), and the coefficient are significant at 1% level of significance. We interpret this evidence as consistent with the economic theory of output maximization and finance theories of agency costs and bankruptcy costs. For a given initial range of *Q* ratio, any increase in this ratio leads firms to increase output and take more risks to maximize shareholders wealth. This causes rivalry in the market, and competition intensifies, particularly from unlevered firms. The fear of bankruptcy and loss of invest-

TABLE 1 Descriptive Statistics for (*Q*, Growth, Profitability, Asset Size, Ownership, Risk, Tangibility, TD/TA) in Every Year and in Overall Years

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | Mean | 3.30 | 1.05 | .036 | 8.92 | 7.39 | .032 | .60 | 0.85 |
| | *N* | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Std. dev. | 1.12 | 2.86 | .017 | .51 | .24 | .018 | .14 | 0.09 |
| | Min. | 1.65 | .001 | .02 | 8.06 | 7.38 | .01 | .40 | 0.55 |
| | Max. | 5.99 | 11.37 | .08 | 10.20 | 8.25 | .08 | .79 | 0.95 |
| 2006 | Mean | 2.0 | .87 | .025 | 9.06 | 7.85 | .08 | .75 | .79 |
| | *N* | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Std. dev. | .67 | 2.72 | .012 | .59 | .31 | .16 | .22 | .20 |
| | Min. | 1.12 | .04 | .001 | 8.14 | 7.38 | .001 | .06 | .09 |
| | Max. | 3.99 | 10.71 | .06 | 10.3 | 8.55 | .62 | .94 | .92 |
| 2007 | Mean | .85 | .06 | .024 | 9.04 | 7.91 | .024 | .81 | .85 |
| | *N* | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Std. dev. | .05 | .28 | .014 | .52 | .30 | .011 | .08 | .05 |
| | Min. | 1.23 | .36 | .01 | 8.11 | 7.38 | .01 | .59 | .69 |
| | Max. | 4.14 | .90 | .07 | 10.3 | 8.55 | .04 | .98 | .95 |
| 2008 | Mean | 1.57 | .07 | .04 | 9.07 | .7.69 | .08 | .87 | .84 |
| | *N* | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Std. dev. | .45 | .08 | .06 | .54 | .31 | .25 | .13 | .07 |
| | Min. | .90 | .12 | .01 | 8.06 | 7.38 | .01 | .44 | .63 |
| | Max. | 2.42 | .24 | .26 | 10.40 | 8.73 | 1.0 | 1.04 | .92 |
| 2005–8 | Mean | 2.25 | .51 | .031 | 9.02 | 7.85 | .05 | .76 | .83 |
| | *N* | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| | Std. dev. | 1.0 | 1.98 | .033 | .53 | .30 | .14 | .18 | .12 |
| | Min. | .90 | .90 | .001 | 8.06 | 7.38 | .001 | .06 | .09 |
| | Max. | 5.99 | 11.37 | .26 | 10.40 | 8.73 | 1.0 | 1.04 | .95 |

NOTES Column headings are as follows: (1) year, (2) index, (3) *Q*, (4) growth, (5) profitability, (6) asset-size, (7) ownership, (8) tangibility, (9) risk, (10) TD/TA.

ment and profitability obliges levered firms to reduce debt. Hence, for some intermediate range of *Q*, the competition forces levered firms to lessen debt.

Finally, for well-established, profitable firms with a very high *Q* ratio and low probability of financial distress and bankruptcy, the output

TABLE 2 Regression Analysis of the Relationship between Capital Structure and Market Power (2005)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | $R$ | .451 | .130 | .812 | .554 | .289 | .126 | .213 | .920 |
| | $R^2$ | .204 | .017 | .659 | .306 | .083 | .016 | .045 | .847 |
| | Adj. $R^2$ | .143 | −.059 | .633 | .253 | .013 | −.060 | −.028 | .693 |
| | Sig. | .091* | .645 | .000*** | .032** | .296 | .654 | .445 | .019* |
| | $F$-test | — | — | – | — | — | — | — | 5.518 |
| | $T$-test | 1.824 | .471 | −5.016 | 2.397 | 1.088 | −.458 | -.787 | — |
| | $\beta$ | .451 | .130 | −.8112 | .554 | .289 | −.126 | −.213 | — |

NOTES Dependent variable: Total Debt Deflated by Total Assets. Column headings are as follows: (1) year, (2) index, (3) $Q$, (4) growth, (5) profitability, (6) asset-size, (7) ownership, (8) risk, (9) tangibility, (10) total. * Significant at $p < 0.10$. ** Significant at $p < 0.05$. *** Significant at $p < 0.01$.

TABLE 3 Regression Analysis of the Relationship between Capital Structure and Market Power (2006)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| 2006 | $R$ | .171 | .933 | .202 | .353 | .015 | .307 | .136 | .994 |
| | $R^2$ | .029 | .870 | .041 | .124 | .000 | .095 | .019 | .989 |
| | Adj. $R^2$ | −0.46 | .860 | −0.033 | .057 | −.077 | .025 | −.057 | .977 |
| | Sig. | .543 | .000*** | .471 | .198 | .958 | .265 | .628 | .000*** |
| | $F$-test | — | — | — | — | — | — | — | 87.691 |
| | $T$-test | .624 | −9.343 | −.742 | −1.358 | −0.053 | −1.165 | .496 | — |
| | $\beta$ | .171 | −.931 | −.202 | −.353 | −.015 | −.307 | .136 | — |

NOTES Dependent variable: Total Debt Deflated by Total Assets. Column headings are as follows: (1) year, (2) index, (3) $Q$, (4) growth, (5) profitability, (6) asset-size, (7) ownership, (8) risk, (9) tangibility, (10) total. * Significant at $p < 0.10$. ** Significant at $p < 0.05$. *** Significant at $p < 0.01$.

maximization seems to dominate the relation between capital structure and $Q$ ratio.

Table 3 for year 2006 shows a significant relationship between the growth and capital structure at 1% (sig. .000, $t$-test –9.943) and a significant relationship between all independent variables and capital structure at 1% (sig. .000, $F$-test 87.691).

Table 4 for year 2007 shows a significant relationship between the $Q$ ratio, profitability and risk and capital structure at different levels 10%,

TABLE 4 Regression Analysis of the Relationship between Capital Structure and Market Power (2007)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| 2007 | $R$ | .443 | .055 | .649 | .282 | .064 | .722 | .118 | .892 |
| | $R^2$ | .196 | .003 | .421 | .079 | .004 | .522 | .014 | .796 |
| | Adj. $R^2$ | .134 | –.074 | .377 | .009 | –0.073 | .485 | –.062 | .591 |
| | Sig. | .098* | .845 | .009*** | .309 | .821 | .002*** | .674 | .047** |
| | $F$-test | — | — | – | — | — | — | — | 3.895 |
| | $T$-test | 1.780 | .199 | –3.075 | 1.059 | .231 | –3.766 | –.430 | — |
| | $\beta$ | .443 | .053 | –.649 | .282 | .064 | –.722 | –.118 | — |

NOTES Dependent variable: Total Debt Deflated by Total Assets. Column headings are as follows: (1) year, (2) index, (3) $Q$, (4) growth, (5) profitability, (6) asset-size, (7) ownership, (8) risk, (9) tangibility, (10) total. * Significant at $p < 0.10$. ** Significant at $p < 0.05$. *** Significant at $p < 0.01$.

TABLE 5 Regression Analysis of the Relationship between Capital Structure and Market Power (2008)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| 2008 | $R$ | .002 | .543 | .043 | .485 | .343 | .486 | .824 | .891 |
| | $R^2$ | .000 | .295 | .002 | .238 | .118 | .236 | .678 | .794 |
| | Adj. $R^2$ | –.077 | .241 | –.075 | .177 | .050 | .177 | .654 | .588 |
| | Sig. | .995 | .036** | .878 | .067* | .210 | .067* | .000*** | .048** |
| | $F$-test | — | — | – | — | — | — | — | 3.851 |
| | $T$-test | –.006 | 2.333 | –.157 | 2.002 | 1.318 | –2.002 | –5.238 | — |
| | $\beta$ | –.002 | .543 | –.043 | .485 | .343 | –.486 | –.824 | — |

NOTES Dependent variable: Total Debt Deflated by Total Assets. Column headings are as follows: (1) year, (2) index, (3) $Q$, (4) growth, (5) profitability, (6) asset-size, (7) ownership, (8) risk, (9) tangibility, (10) total. * Significant at $p < 0.10$. ** Significant at $p < 0.05$. *** Significant at $p < 0.01$.

1% and 5% respectively (sig. .098, $t$-test 1.780; sig. .009, $t$-test –3.075; sig. .009, $t$-test –3.766 ) and a significant relationship between all independent variables and capital structure at 5% (sig. .047, $F$-test 3.895). Thus, our results confirm a saucer-shaped relationship between debt ratio and profitability.

We interpret this evidence as a trade-off between the effects of asymmetric information, agency costs and tax benefits. For a given initial range of profitability, any increase in this ratio leads firms to internally

TABLE 6 Regression Analysis of the Relationship between Capital Structure and Market Power (2005–2008)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| 2005–8 | $R$ | .221 | .497 | .069 | .025 | .082 | .274 | .164 | .382 |
| | $R^2$ | .049 | .247 | .005 | .001 | .007 | .075 | .027 | .217 |
| | Adj. $R^2$ | .032 | .234 | −.012 | −.017 | −.010 | .059 | .010 | −.210 |
| | Sig. | .090* | .000*** | .599 | .848 | .531 | .034** | .211 | .000*** |
| | $F$-test | — | — | – | — | — | — | — | 5.396 |
| | $T$-test | 1.726 | −4.363 | −.529 | .192 | .630 | −2.168 | −1.266 | — |
| | $\beta$ | .221 | −.497 | −.069 | .025 | .082 | −.274 | −.164 | — |

NOTES Dependent variable: Total Debt Deflated by Total Assets. Column headings are as follows: (1) year, (2) index, (3) $Q$, (4) growth, (5) profitability, (6) asset-size, (7) ownership, (8) risk, (9) tangibility, (10) total. * Significant at $p < 0.10$. ** Significant at $p < 0.05$. *** Significant at $p < 0.01$.

finance their output growth and minimize the cost of financing. It is also likely that at relatively lower levels of profitability, firms may not have much incentive to issue debt, as other non-debt tax shields may be available to them. There may also exist an intermediate range of profitability where firms do not have sufficient incentive either to increase or decrease any further. Finally, at higher levels of profitability and given their market power and intensifying competition, firms will increase borrowing to expand their output. Also, they have more profits to shield from taxes. Further, agency costs will be higher once firms reach high levels of profitability.

The coefficients of other control variables are also statistically significant. Consistent with the option model of Myers (1977) and the pecking order hypothesis of Myers and Majluf (1984), our results show a significant negative relation between growth and debt ratio. We also find a negative relationship between (systematic) risk and debt ratio. This finding is consistent with the trade-off theory. The positive relation between size and debt ratio is evidence in favor of the hypotheses that larger firms tend to be more diversified and less prone to bankruptcy, and the transaction costs of issuing debt are smaller. The negative relation between debt ratio and the size of shareholding means that more diffused ownership results in lower leverage. The result supports the agency hypothesis. The results indicate a significant positive relation of tangibility (FA/A ratio) with debt ratio. These results vindicate the trade-off theory that

postulates a positive correlation between debt ratio and tangibility since fixed assets act as collateral in debt issues.

Table 5 for year 2008 shows that there is a significant relationship between the growth, asset, risk and tangibility and capital structure at different levels 5%, 10% and 1% respectively (sig. .036, *t*-test 2.333; sig. .067, *t*-test 2.002; sig. .067, *t*-test -2.002; sig. .000, *t*-test –5.238) and a significant relationship between all independent variables and capital structure at 5% (sig. .0487, *F*-test 3.851). Finally, table 6 contains all periods from years 2005–2008 and indicates a significant relationship between the *Q* ratio, growth and risk and capital structure at different levels, 10% and 1% respectively (sig. .090, *t*-test 1.726; sig. .000, *t*-test –4.363; sig. .034, *t*-test –2.168) and significant relationship between all independent variables and capital structure at 1% (sig. .000, *F*-test 5.396).

The arguments of the results are as follows. A bank in oligopoly condition sustains its aggressive production and high-income strategy by employing a higher level of debt. Shareholders of the bank gain in terms of increased wealth. In adverse market conditions, the limited liability provides protection to shareholders against the risky production decision by which lenders would suffer. Thus, the bank's debt level will increase as it gains market power reflected in *Q*. On the other hand, as debt increases, there are significant costs in terms of increased probability of bankruptcy and financial distress. This cost would be accentuated by the behavior of no or low-debt banks with 'deep purses.' They would resort to predatory price behavior and lead their rivals to bankruptcy. This argument suggests a negative relationship between capital structure and *Q*. These two opposing effects point to the possibility of a non-linear relationship between capital structure and market power. As a bank starts gaining market dominance, it will increase debt to increase its production and income. That is, as bank's market power increases, they employ more debt to pursue their output maximization strategy. This attracts rival banks to intensify competition by cutting price and/or output. At the intermediate level of market dominance when competition intensifies through price cut, higher costs of debt squeeze out the profitability of highly levered firms, and their chances of financial distress and bankruptcy increase. Levered banks react by reducing debt or increasing production through improved assets utilization. However, after consolidating their position, banks at a higher level of market dominance leverage make use of debt in expanding their production. Firms with strong profitability and reserve funds and high market dominance adopt a high-risk production strategy

and use more debt. Thus, we can predict a cubic relationship between capital structure and market power. In other words, firms at relatively lower and higher levels of market power employ more debt, while firms at the intermediate level of market dominance are vulnerable to rivals' competitive threat and reduce their debt.

## Conclusion and Recommendations

This study has empirically examined the relationship between capital structure and market power using data for 14 Jordanian banks for the period from 2005 to 2008. The study provides new insights into the way in which the capital structure is measured by total debt-to-assets ratio and market power. That is, at lower and higher ranges of Tobin's *Q*, banks employ higher debt, and reduce their debt at intermediate range. This is due to the complex interaction of market conditions, agency costs, and bankruptcy costs. We also show a saucer-shaped relation between capital structure and profitability because of the interplay of agency costs, costs of external financing and interest tax-shield. In addition to the *Q* ratio and profitability, other independent variables are included in my estimation. We find that size and tangibility have a positive and growth influence, while risk (systematic) and ownership have a negative influence on capital structure.

Future research can be directed in several ways. First, we will address the issue of dynamic estimation using system GMM to examine whether or not the underlying dynamic structure affects the findings. Second, we will look into the difference between manufacturing industries and services, since one can argue that firms in these sectors will react differently to increasing bank market concentration. Third, we want to instrument the bank market structure to explicitly account for potential endogenously. Finally, we will investigate whether the ownership structure of the firm has an impact on the relationship between bank market concentration and leverage

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