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Capital Structure Decisions and Corporate Performance: Does Firm's Profitability Matter?

Wafa Ghardallou

Department of Accounting, College of Business Administration, Princess Nourah bint Abdulrahman University, P.O. Box 84428, Riyadh 11671, Saudi Arabia

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This study aims to investigate the relationship between financing decisions and firm performance. It particularly investigates the heterogeneous effects of capital structure ratios on financial profitability. The study employs the Quantile regression methodology on a sample of 120 non-financial companies listed on Tadawul stock exchange during the period 2017–2020. Financial performance was measured using return on assets, return on equities and Tobin's Q variables in order to assess accounting and market performance. Data on the various variables is obtained from the companies' annual reports. Quantile regression results show that debts to equity ratio hamper firms' performance where as equity financing ratio increases business profitability. Additionally, findings demonstrate that this relationship is nonlinear. Particularly, a debt to equity ratio has a greater negative effect on performance of high-profitable firms. However, the positive effect of the equity financing ratio seems to be higher in high profitable companies than low ones. These results would help managers of non financial firms regarding optimal capital structure decisions. Indeed, managers of non-financial firms could use results of this study as a benchmark to make efficient decisions related to the structure of the capital such as reducing the proportion of debts in the capital and increasing the weight of equity financing. Particularly, enterprises in the early stages of development, with lower profits reflected in return on assets, return on equities, and Tobin's Q should carefully avoid debt, whereas firms with big earnings are encouraged to raise their capital by issuing new shares in the financial market.

Keywords: Debts to equity, Equity financing, Financial performance, Quantile regression, Tadawul stock exchange

Introduction

Since more than fifty years ago, the primary emphasis of corporate finance has been the examination of financial structure. As a result, theories on the factors influencing capital structure have been developed. The recent theoretical and empirical studies that have focused on the topic of the company's financial behavior include many studies.[1–4]

The financing of the company's investments and its activity are an important political issue for the company which will influence its future growth. Companies that have the ambition to grow need capital to support their development. However, to speak of business financing is to address not only the question of the distribution of equity and debt, but also that of the duration of the debt. However, if debt financing makes it possible to increase the return on equity thanks to the financial leverage effect, its counterpart may be the risk it generates both from the point of view of the return on equity and from the point of solvency view.

Moreover, The study of capital structure has been the topic of considerable research, yet it has always prompted theoretical and empirical reflections and disagreements among scholars.[5] A survey of studies on capital structure reveals three fundamental theoretical models that might explain company financing decisions: the theory of optimal debt ratio (The Trade-Off Theory), the hierarchical theory of finance (The Pecking Order Theory), and, more recently, the theory of Market Timing. So far, the validity or rejection of these hypotheses has been a matter of empirical disagreement. The disagreement between researchers is observed on the theoretical level, because, according to the review of theoretical literature, these various theories differently explain the influence of indebtedness on the profitability of companies. Moreover, the disagreement between researchers is observed not only on the theoretical level, but also on the empirical level, it is because the two contradictory effects (negative and positive) of indebtedness on profitability have been confirmed by the researchers.

Author for Correspondence
E-mail: wafa.ghardallou@gmail.com; wrghardoallou@pnu.edu.sa

Furthermore, the role of capital structure in explaining company performance has also been the subject of several studies since the study by Modigliani & Miller.[6] However, this position continues to be a hot issue that has piqued the interest of many scholars.[7–9] Indeed, researchers analyze the capital structure and try to determine if an optimal capital structure exists. The optimal capital structure is generally defined as one that minimizes business capital costs, while maximizing business value. In other words, the optimal capital structure is the one that maximizes corporate profitability.

Modigliani and Miller were the first to theoretically study the influence of financial structure, and more specifically financial leverage, on firm value.[6] They concluded that in the presence of a perfect financial market and under certain assumptions, all forms of financing are equivalent. According to the above, a productive investment is made only if it increases the market value of the company, and it depends only on the comparison between its specific return and the average cost of capital. The decision is therefore independent of the financing structure chosen. Subsequently, this assumption was challenged by Modigliani & Miller[10] when they considered the tax deductibility of financial costs[11], when they considered agency costs,[12] with the Trade-Off theory, which incorporates bankruptcy costs in the analysis, and[13] with the Pecking-Order theory.

Corporate debt is traditionally considered in the financial literature as a tool for controlling managers[11] and improving corporate performance. It is in the interest of companies to go into more debt, because by increasing the debt, the manager would be forced to manage better in the interest of financial creditors and all other stakeholders, including shareholders.[14]

The Trade-Off Theory (TOT) and the Pecking Order Theory (POT) are two prominent approaches to financial structure in the economic literature. The trade-off theory assumes that the best structure is found by weighing the benefits and drawbacks of the major funding sources. Unlike the preceding theory, the pecking order theory rejects the calculation of an optimal debt ratio in favour of the presence of a funding hierarchy based on the concept of knowledge asymmetry. These two theories serve as the foundation for this paper. The trade-off theory stems from a revision[6] of theorem in terms of taxation and bankruptcy costs, followed by the addition of new hypotheses - agency costs and signal value - that enrich the optimization procedure (reaching a target ratio) and lead to moving beyond the static framework of equilibrium to include it in a dynamic context. Large firms and publicly traded companies are the focus of these numerous hypotheses. Similarly, the addition of agency expenses allows for the determination of an optimal capital structure.[11] The objectives of the company's executives (principals) may not always align with those of its partners (agents), resulting in agency expenses that have an impact on the company's financing. Control or monitoring costs, limitation costs, and opportunity costs are the three categories of agency costs. The fact that creditors have priority over shareholders in the case of bankruptcy creates conflicts of interest between shareholders and creditors. When agency costs are kept to a minimum, optimal debt is obtained. Firms and banks have agency conflicts, with the latter prepared to lend only if the repercussions of information asymmetries are addressed. The weight of debt in some companies' liabilities can also be explained using signal theory. This hypothesis assumes that the company's internal agents, who are more informed than the external agents, who are mostly banks, have an interest in conveying part of the information to the latter via a signal in order to gain access to loans.[15]

The pecking order theory, on the other hand, was created by Myers & majluf[13] and is based on the knowledge asymmetry that exists between the company's internal actors (owners, managers) and its external actors. Executives adopt a financial policy that prioritizes internal finance above external funding in order to reduce the expenses associated with knowledge asymmetry. The leader, according to this idea, prioritizes his preferences in the following order: self-financing, non-risky debt, risky debt, capital increase.[16] This theory, according to Ang[17], can readily be applied to the scenario of corporations that do not seek to create an ideal financial structure, but instead seek to arrange their preferences for internal versus external financing and debt against equity in their financing decisions. When the financing demands of an investment exceed the cash flow provided internally, many companies desire to borrow, but they frequently encounter unfavourable selection and information costs in their credit relationship. These costs may be insignificant for internal funds (self-financing), but they are substantial when new shares are issued, putting debt expenses in

the middle. The Pecking Order Theory has been used to refute assumptions about company age and profitability. Some authors argued in favour of POT, claiming that SMEs use debt less as their life cycle progresses from youth to maturity.[18] It is also argued that maturity would help businesses gain access to markets.[19] Some authors proposed an "extended POT" that distinguishes profitable from non-profitable firms and may be used to high-growth-potential companies.[20]

The balance of equities and debts has to have an impact on the organization's success. More particular, there is a protracted debate about what degree of debt is the best for managers to choose. In fact, managers must make the best option possible in order to maximize shareholder value, taking into account the fact that firm performance is influenced by the debt-to-equity ratio. For a long time, this conundrum has piqued the interest of many academics.

Many studies have been conducted in this regard, focusing on the impact of capital structure on business performance.[21–24] It is stated that choosing the best capital structure increases the firm's value and hence the wealth of its owners.[25] Many scholars argue that there is a favourable association between company performance and debt-to-equity ratio in Asian countries[26], while others claim that capital structure has a detrimental impact on business profitability.[27]

According to the research analysis above, capital structure is likely to have a non-linear effect on business performance. According to the distress costs and debt overhang hypothesis, the effect of debts to equity financing on business performance is expected to be negative, whilst the effect of equity financing is expected to be positive.[28] As a result, the link between capital structure and company performance is predicted to be heterogeneous in this study.

Various research and theories have looked into the relationship between corporate structure and company performance[29–31]; but few have established a precise capital structure threshold that, if taken into account, can have distinct implications on corporate profitability, particularly in Asian countries. Indeed, regardless of the firm's profitability level, academics seek to explore the influence of capital structure on firm performance. As a result, the impact of different degrees of capital structure on firm value is distinct. This is where this study stands out since it approaches the capital structure issue from a new angle. Furthermore, the vast bulk of existing research is conducted in industrialized countries. However, because of the unique nature of their business environments in comparison to Middle Eastern countries, the observed results may not be applicable to Middle Eastern countries. Saudi Arabia has a unique economic environment in this regard, which is marked by the absence of corporate tax and an illiquid bond market. These facts drive us to investigate Saudi Arabian corporate finance decisions. Finally, because Saudi Arabia is a high-income country (World Bank, 2020) with significant financial and industrial sectors, understanding corporate finance decisions is critical to the country's economic success.

This paper aims to examine the heterogeneity of the relationship between financing decisions and the financial performance in order to detect a potential non-linear effect of capital structure on corporate profitability of Saudi listed firms. Data on the various variables are collected from the companies' annual reports available on Tadawul stock exchange. Used annual reports consist of balance sheets and statements of comprehensive income. Finally, the sample consists of 120 listed firms from 2017 to 2020.

In various respects, this work contributes to the literature on business performance. First, it tries to close the gap between financial performance literature and the optimal capital structure by studying the impact of various capital structure levels on Saudi listed businesses' performance. Second, it gives scholars a place to start looking into concerns surrounding capital structure decisions in Asian economies.

Experimental Details

The purpose of this research is to investigate the heterogeneity of the link between capital structure and company performance. Data on the various variables are gathered from yearly reports published on the Tadawul stock exchange. The final sample includes 120 publicly traded companies from 2017, the year Saudi Arabia adopted IFRS, until 2020.

The Dependent Variable

Firm performance is measured through three variables: return on assets (ROA), return on equity (ROE) and Tobin's Q (Tobin's Q). These variables are commonly used in the empirical literature.[32–35,9] Return on assets (ROA) equals the "net income divided by the total assets in the period". Return on equity (ROE) equals the "proportion of net income to

total equity in the period". Tobin's Q (TQ) is defined as the "sum of the market value of equity and the book value of total assets minus the book value of equity, divided by the book value of total assets".

The Independent Variables

Following previous studies, capital structure is measured by two variables: the debts equity financing ratio which is equal to the ratio of debts to equity (DTE) and the equity financing ratio which is defined as total equities to total assets (ETA).[36,37]

The Control Variables

We adhere to the literature and provide a set of control variables that have been utilized in past studies. We include three control variables in particular. First, the firm size (Size) is measured by the "natural logarithm of total assets at the year end".[38] We also consider the increase in corporate sales (SG) which is equal to the "difference of sales of the current year and the previous year divided by sales of the current year", and asset tangibility (Tangible), which is equal to the "ratio of fixed assets to total assets".[39]

The Econometric Model

Most of the previous studies estimate the effect of capital structure on firm performance by assuming that this relationship is linear, however companies with higher productivity and operational ability are better able to use greater levels of capital than that of firms with lower productivity. With that note, this study applies the Quartile regression approach which allows testing the relationship is heterogeneous. Quartile regression is used by many previous studies.[40,41] This regression is more robust than the OLS regression especially when the dependent variable's distribution is non-normal. This is the case of our dependent variable which has a non-normal pattern. This study will particularly consider the 15th, 25th, 50th, and 75th quantiles.

We estimate the following equation:

$$Yit = \beta 0' Xi,t + ei,t\,\theta i,t \text{ with } Quant\theta\,(Yit / Xi,t) = \beta 0' Xi,t(1)$$

where companies are indexed by the subscript i and time periods are indexed by the subscript t. Y_{it} refers to ROA, ROEand Tobin's Q measures of firm performance. $X_{i,t}$ is the regressors' vector. B is the estimated parameter vector. $e_{i,t}$ represents residuals and $Quant_{\theta}(Y_{it}/ X_{i,t})$ represents $\theta_{t,h}$ conditional quantile of Y_{it} given $X_{i,t}$. θvaries between 0 and 1.

Results and Discussion

Descriptive Statistics

Descriptive statistics of the variables used in the study are displayed in Table 1. The Table shows that the study uses 450 observations. In addition, it is found that the financial performance indicators have approximately the same mean value. Return on assets and Tobin's Q, with corresponding standard deviation values of 0.222 and 0.321, reveal less variance in the distribution of the performance values of the sampled firms. Tobin's Q has the highest skewness value whereas (ROA) has the highest kurtosis value.

Correlation Matrix

Establishing the correlation matrix between the study's variables gives descriptive statistics more depth. The correlation between the endogenous and the explanatory variables is shown in Table 2. It can be seen that capital structure variables have different correlation with financial performance variable. Specifically, (DTE) show a negative correlation with the various dependent variables whereas the correlation is positive with the (ETA) variable. With the anticipated sign, control variables and dependent variables are connected. Consequently, the explanatory factors may be used in the same model as the correlation between them is not high.

Result of the Quantile Regression

Previous empirical researches demonstrated that the relationship between firm capital structure and firm

Table 1 — Descriptive statistics

	ROA	ROE	TQ	DTE	ETA	Size	Tang	SG
Mean	0.054	0.058	0.452	0.321	0.266	15.700	0.621	0.211
Max	0.400	0.698	0.965	0.921	0.821	20.631	0.843	24.300
Min	−5.815	−9.09	0.023	0.089	0.549	8.322	0.001	−19.02
Std.dev	0.222	0.516	0.321	0.143	0.511	1.522	0.132	2.793
Skewness	−18.436	−16.941	0.109	0.032	1.221	0.609	−0.211	0.435
Kurtosis	375.712	327.781	2.078	2.160	3.411	4.876	3.417	4.800
Observations	450	450	433	430	430	450	448	448

Table 2 — Correlation matrix

	ROA (1)	ROE (2)	TQ (3)	DTE (4)	ETA (5)	Size (6)	Tang (7)	SG (8)
(1)	1	—	—	—	—	—	—	—
(2)	0.922	1	—	—	—	—	—	—
(3)	0.432	0.370	1	—	—	—	—	—
(4)	−0.112	−0.074	−0.043	1	—	—	—	—
(5)	0.543	0.311	0.211	0.402	1	—	—	—
(6)	0.021	0.099	0.025	0.012	0.041	1	—	—
(7)	0.091	0.122	0.017	0.052	0.112	0.276	1	—
(8)	0.119	0.211	0.080	−0.033	0.078	−0.054	−0.010	1

profitability is ambiguous.[5,6] These contradicting results may be explained if we take into account the various profitability levels of the companies, and particularly those that are highly profitable. Indeed, these latter are more willing to take excessive risk with various effect on performance. Therefore, this section describes the results of the use of the Quantile regression in an attempt to examine non linearity in the effect of capital structure and firm profitability.

Results in Tables 3, 4 and 5 show Quantile regressions at different levels using the three performance indicators (ROA), (ROE) and (TQ). Globally, findings indicate that (DTE) variable has a negative and significant coefficient through all the regressions. This confirms previous results and demonstrate that more debts adversely affect firms' performance.[21,24,27] However, it is shown in Table 3 that this negative relationship is more pronounced in upper quantile compared to lower quantiles. Thus, the magnitude of the adverse effect of total leverage on financial performance is greatest at higher quantiles, indicating that leverage has a significant negative impact on greater-profitable enterprises' profitability. For instance, Table 3 shows that coefficient associated to the variable (DTE) is −0.622 at Q15 but it becomes equal to −3.561at Q75. Similarly, using (ROE) performance measure, coefficient associated to (DTE) moves from −1.188 at Q15 to −3.341 at Q75.

Moreover, results in Tables (3), (4), and (5) demonstrate that the second proxy of capital structure which is the equity financing ratio (ETA) shows a different trend compared with the debts to equity financing ratio (DTE). Particularly, the coefficient associated to the equity financing ratio (ETA) is positive which corroborates findings of some previous researchers.[28] This positive impact seems to be greater in higher profitable firms. Specifically, when it reaches the top quantile, the favourable effect becomes more obvious. Indeed, using (ROA), coefficient associated to the variable (ETA) is equal to 1.332 in Q15 and increases to 3.400 in Q75. Moreover, Tables 4 and 5 show respectively that coefficients associated to the variable (ETA) increases

Table 3 — Estimation results using ROA as a dependent variable

	(1) Q15	(2) Q25	(3) Q50	(4) Q75
Size	0.120**	0.177**	0.198*	0.287*
	(0.032)	(0.076)	(0.042)	(0.065)
Tangible	0.054*	0.066**	0.097	0.121
	(0.063)	(0.093)	(0.070)	(0.082)
SG	0.328**	0.347	0.461*	0.622*
	(0.142)	(0.227)	(0.291)	(0.291)
DTE	−0.622***	−1.810**	−2.325*	−3.561*
	(0.210)	(0.641)	(0.663)	(0.352)
ETA	1.332***	2.754**	2.321*	3.400*
	(0.361)	(0.133)	(0.500)	(0.810)
Constant	−1.337*	−1.157*	−1.320*	−1.301*
	(1.266)	(1.266)	(1.266)	(1.266)
Observations	270	270	270	270
Nb. Firms	100	100	100	100

Note(s): Standard errors are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. Here, ROA is the dependent variable; DTE is the debts to equity ratio; ETA is the equity financing ratio; SG is sales growth; Tangible is Asset tangibility; Size is the firm size.

Table 4 — Estimation results using ROE as a dependent variable

	(1) Q15	(2) Q25	(3) Q50	(4) Q75
Size	0.177**	0.165**	0.221*	0.223*
	(0.087)	(0.051)	(0.030)	(0.030)
Tangible	0.032**	0.043**	0.120	0.188**
	(0.068)	(0.083)	(0.030)	(0.082)
SG	0.397	0.347	0.441*	0.592*
	(0.157)	(0.117)	(0.161)	(0.181)
DTE	−1.188**	−1.923**	−2.185*	−3.341*
	(0.651)	(0.751)	(0.223)	(0.365)
ETA	2.321**	2.910**	3.321*	4.571*
	(0.360)	(0.273)	(0.350)	(0.411)
Constant	−2.300	−2.300	−2.300	−2.300
	(1.301)	(1.301)	(1.301)	(1.301)
Observations	270	270	270	270
Nb. Firms	100	100	100	100

Note(s): Standard errors are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. Here, ROE is the dependent variable ; DTE is the debts to equity ratio; ETA is the equity financing ratio; SG is sales growth; Tangible is Asset tangibility; Size is the firm size.

Table 5 — Estimation results using Tobin's Q as a dependent variable

	(1) Q15	(2) Q25	(3) Q50	(4) Q75
Size	0.081*	0.162**	0.221*	0.143*
	(0.064)	(0.062)	(0.040)	(0.080)
Tangible	0.088	0.174**	0.109	0.131**
	(0.040)	(0.043)	(0.020)	(0.112)
SG	0.111*	0.232	0.428*	0.622*
	(0.172)	(0.311)	(0.286)	(0.291)
DTE	−0.850	−1.311**	−2.862*	−3.851*
	(0.423)	(0.851)	(0.723)	(0.005)
ETA	0.971*	1.230**	2.501*	3.654*
	(0.610)	(0.623)	(0.300)	(0.751)
Constant	2.401	2.401	2.401	2.401
	(1.322)	(1.322)	(1.322)	(1.322)
Observations	258	258	258	258
Nb. Firms	96	96	96	96

Note(s): Standard errors are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1. Here, TQ is the dependent variable, DTE is the debts to equity ratio; ETA is the equity financing ratio; SG is sales growth; Tangible is Asset tangibility; Size is the firm size.

Table 6 — Quantile regression F test results

Results based on ROA	H0 : Q15 = Q75 F(1,806)= 1.96 Pro> F= 0.00	H0 : Q25 = Q75 F(1,806)= 2.57 Pro> F= 0.00	H0 : Q50 = Q75 F(1,806)= 2.44 Pro> F= 0.00
Results based on ROE	H0 : Q15 = Q75 F(1,806)= 2.22 Pro> F= 0.00	H0 : Q25 = Q75 F(1,806)= 3.21 Pro> F= 0.00	H0 : Q50 = Q75 F(1,806)= 4.75 Pro> F= 0.00
Results based on TQ	H0 : Q15 = Q75 F(1,806)= 3.32 Pro> F= 0.02	H0 : Q25 = Q75 F(1,806)= 5.11 Pro> F= 0.08	H0 : Q50 = Q75 F(1,806)= 7.88 Pro> F= 0.00

Note: Pro indicates the probability.

to 4.571 and 3.654 in Q75. This means that in highly profitable companies, shareholders' return are increased following equity financing decisions.

Finally, in order to assess the validity of the Quantile regressions, Table 6 provides the F-statistics and accompanying p-values. F statistics are used to test the null hypothesis of coefficient homogeneity using different pairings of quantiles. The results show that the homogeneity null hypothesis is disproved by the F test at 1% across all regressions. This indicates that the impact of capital structure decisions on company performance is asymmetric and it varies across the different distribution segments.

Conclusions

The current research examines the impact of capital structure decisions on business performance. It focuses on the impact of stock and debt financing decisions on the financial performance of a sample of Saudi publicly traded enterprises. The study's goal is to determine whether this influence is nonlinear in relation to corporate profitability. Findings show that the impact of capital structure decisions varies dramatically depending on the profitability quantile level. Particularly, Saudi highly successful enterprises could better fund their activities through equity rather than debts.

The findings would be a useful tool for managers in Saudi companies to make effective capital structure decisions, such as raising the share of stocks in their capital, specifically for enterprises with high profitability. Finally, this study does not examine the influence of borrowing costs, therefore, future research may incorporate borrowing costs when evaluating capital structure options.

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