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TARGET CAPITAL STRUCTURE AND ACQUISITION CHOICES: EVIDENCE FROM THE GREEK MARKET

By

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Abstract

The main objective of this paper is to analyze whether deviations from the target capital structure affect firms' decisions to become acquirers. The analysis is conducted in two stages. In the first stage we estimate the target leverage ratio considering the main determinants of capital structure. In the second stage we examine whether the deviation from the predicted target debt ratio affects acquisition choices. Our data come from 112 Greek companies listed on the Athens Exchange during 1997–2002. Our empirical results justify our hypothesis that the leverage deficit is negatively related to the probability of a firm becoming an acquirer. Thus, underleveraged firms, according to their target capital structure, are more likely to become acquirers than overleveraged firms. We also test whether size and profitability affect acquisition choices and we find that larger firms are more likely to become acquirers, whereas profitability does not seem to play an important role. Results and conclusions are consistent with similar studies conducted for other economies. JEL Classifications: G3, G32.

Keywords: Corporate Finance, Capital Structure, Mergers and Acquisitions, Financial Leverage Deficit, Greek Firms.

1. Introduction

Investigating capital structure implications in mergers and acquisitions (M&As) activities is a multi-level area. This complex field can be approached by several different aspects and interesting questions that are frequently asked and analyzed are, for example, how do firms finance their acquisition, do they retain a target capital structure, do they use any financial slack, can capital structure be used by a target-firm as a tool to prevent an acquisition, can a cash acquisition be considered as non-dividend payments and so on.

In this paper we analyze whether a deviation from a target capital structure leads to differences in acquisition activities. We actually follow the idea of Uysal (2006) who finds that underleveraged firms, relative to their target debt ratios, are more likely to make acquisitions. We also follow Hovakimian et al. (2001) using a

two-step estimation procedure to empirically analyze whether the leverage deficit has any effect on acquisition choices. Thus, we focus our analysis in the theoretical approach of target capital structures, applying this approach to the M&As context. To the authors' knowledge this is the first paper to tackle this issue for the Greek market, analyzing the effects of the leverage deficit on M&As.

The paper is organized as follows. In the next session we review some of the theoretical and empirical literature concerning target capital structure and M&A activities. In section three we describe our data and estimate the model used in our analysis. The fourth section presents the results of the empirical analysis and a discussion of the conclusions that can be derived from the results. Finally, we summarize our findings in the last section.

2. Target capital structure in M&As

The concept of target capital structure is actually one of the two main approaches to capital structure theory. The other is the pecking order theory, whereas a new approach known as the market timing approach offers a new perspective in explaining capital structure determination.

The target capital structure rationale is adopted by three main capital structure theories. First, the tax-based financial distress theory hypothesizes that firms trade-off tax benefits of debt financing against financial distress costs (Modigliani and Miller, 1963). Second, the agency model of Jensen and Meckling (1976) concludes that a target capital structure is determined so that agency costs of debt and equity are minimized. Finally, according to the signalling model (developed by Ross, 1977), capital structure is used as a signal to investors about the firm's value, resulting in balancing the costs and benefits by using this signalling effect, to a specific target capital structure.

On the other hand, Myers (1984) and Myers and Majluf (1984) developed the pecking order pattern of financing based on the asymmetric information theory. According to this approach, managers do not follow any target capital structure, but they have a preference order on the various sources of financing: internal equity (i.e. undistributed earnings mainly), debt financing and external-new equity financing. The market timing approach offers a new perspective by concluding that capital structure is the cumulative outcome of a series of market-timing-motivated financing decisions (Baker and Wurgler, 2000, 2002).

Empirical evidence on the concept of target leverage is mixed. Graham and Harvey (2001) report that 81% of firms have target debt ratios. Titman and Wessels (1988) analyze the explanatory power of three main capital structure theories and conclude to a support of the static tradeoff theory. Rajan and Zingales (1995) investigate the determinants of capital structure across the G-7 countries

and also reach to similar conclusions regarding the support of the target capital structure rationale. More recent studies of Leary and Roberts (2005), Flannery and Rangan (2006) and Kayhan and Titman (2007) conclude that firms tend to rebalance their capital structure to a specific long-term target.

Regarding the Greek market, in a similar survey to Grahan and Harvey (2001), Vasiliou and Daskalakis (2005) report that 80% of the Greek listed firms do set a long-term target of capital structure. Vasiliou et al. (2006) also provide adequate evidence that the pecking order pattern of financing does not seem to hold for the Greek firms. Thus, in this paper we analyze whether a deviation from the target capital structure affects the firms' acquisition choice.

According to Uysal (2006) there are two pieces of evidence that link leverage deficit to acquisitions. First, firms use cash, by large, in these acquisitions. He reports that only 18% of acquisitions are all-stock offers, whereas 82% of the deals have cash component. Bearing in mind that most cash deals are financed with debt (Yook, 2003) borrowing debt capacity (i.e. negative leverage deficit) is very important in financing acquisitions. In line with this rationale is the finding of Harford et al. (2007), who show that when a bidder's leverage is over its target level, it is less likely to finance the acquisition with debt and more likely to finance the acquisition with equity. Second, underleveraged firms are more acquisitive; Uysal (2006) reports that the unconditional probability of acquiring a target is 11.3% for the underleveraged sub-sample whereas it is only 7.7% for the overleveraged firms. The main conclusion of the above analysis is that target capital structure and the financial deficit specifically should be considered when analyzing acquisition procedures.

3. Data and measurement of variables

We analyze the effect of financial deficit to acquisitions for all the Greek firms listed in the Athens Exchange during the period of 1997 to 2002. Specifically, we use firm data extracted from the published financial statements of the listed firms from the Athens Exchange (ATHEX) database, excluding banks and firms in the financial sector. All companies included in our analysis fulfil two basic criteria. First, all firms were listed in the market in 1996. This criterion was imposed to ensure that capital structure was not distorted by the effects of a recent official listing. Second, none of the firms was expelled from the market during the period examined. The number of our firms was further reduced to 112 firms, as a result of missing data. This number of firms corresponds to 55% of the listed companies on the Athens Exchange in 1996.

Regarding the M&As, the ATHEX does not report any mergers and acquisitions prior to 2001. Another source of listed firms that proceed to M&As is the

annual reports of the Hellenic Capital Market Committee (HCMC). Thus, we obtained the list of firms that proceeded to at least one M&A during 1997 and 2002 by combining both sources of the HCMC and the ATHEX. Thus, we analyze a panel of 112 listed firms, 20 of which acquired at least one firm according to the above mentioned criteria.

Our approach is similar to Uysal (2006) who uses a two-step estimation procedure similar to Hovakimian et al. (2001). Thus, in the first step we estimate the target leverage ratio by running a regression of leverage ratios on the main determinants of capital structure. In the second stage regressions, we examine whether the deviation from the predicted target capital structure affects acquisition decisions. Our main difference with the model of Uysal (2006) is that he uses the binary probit model whereas we evaluate the effect of the leverage deficit variable as an independent variable in an ordinary least squares regression. The main reason is that in the probit regression, coefficient estimates are hard to interpret, whereas in the ordinary regression one may interpret the effect of the independent variable considering the coefficient.

Thus, the model used in the first step of the analysis refers to the determination of the target leverage ratio. According to the traditional capital structure literature, the main determinants of capital structure are size, profitability, growth and asset tangibility (Rajan and Zingales 1995, Hovakimian et al. 2001).

Specifically, our dependent variable is the debt ratio ($DR_{i,t}$) which is defined as the ratio of total debt divided by the total assets of the firm. Total debt contains both long-term and short-term liabilities. The strict notion of capital structure refers exclusively to long-term leverage. However, most of the firms in Greece use either very little - less than 10% - or no long-term capital, mainly because of the hesitation of the banking sector to provide long-term financing with attractive terms and the stock market boom of 1999 which led most of the firms to dramatically increase their equity through seasoned offerings and cover their needs in funds until for the mid-term period, at least until 2002. Thus, we decided to include short-term financing as a measure of gearing.

Our first regressor is the asset structure ($AS_{i,t}$) which is defined as the ratio of the tangible assets divided by the total assets of the firm. A firm with lots of securable assets should maintain a capital structure with more debt. More specifically, the costs of financial distress depend on the types of assets that a firm has. For example, if a firm retains large investments in land, equipment and other fixed assets, it will have smaller costs of financial distress than a firm that relies on current assets. Scott (1976) argues that a firm determining the optimal capital structure will issue as much secured debt as possible, because the agency costs of secured debt are lower than those of unsecured debt. Securable assets

are considered the tangible assets such as plant and machinery. Thus, firms with securable assets should issue more debt. Therefore, firms that employ large amount of tangible assets are expected to maintain more debt level than firms with lower fixed assets ratios.

We also test whether there is a relationship between the growth of the firm ($GROWTH_{i,t}$) and its capital structure. We surrogate our growth measurement as the annual change on earnings. As already mentioned in the previous section, there should be a negative relationship between this regressor and our dependent variable. On the one hand, growth causes significant variations in the value of a firm which can be interpreted as risk. A firm that has considerable growth opportunities will employ less debt in its capital structure. On the other hand, the cash flows of a firm which value is most likely to remain stable in the future are predictable and its capital requirements can be financed with debt more easily than those of a firm with growth potential. Myers (1977) uses an option model to explain why high-growth firms will prefer less debt financing than low-growth ones.

To capture tax effects, we also use the non-debt tax shields variable ($NDTS_{i,t}$). NDTS refer to various elements, such as the depreciation expenses, the investment tax credits and tax-loss carry-forwards. Titman and Wessels (1988), provide an analytical formula for the calculation of the NDTS but they do not reach to any significant results when analyzing the NDTS. While DeAngelo and Massulis (1980), Barton et al. (1989), Wald (1999) and DeMiguel and Pindado (2000) prove an inverse relationship between debt and NDTS, other studies of Bradley et al. (1984) and Grier and Zychowicz (1994) suggested exactly the opposite by showing a direct relationship between these variables. These inconsistent results may derive from the fact that measurements of non debt tax shields vary. For example, Wald (1999) measures NDTS as the ratio of depreciation to total assets, whereas DeMiguel and Pindado (2000) calculate NDTS as the earnings before taxes minus the ratio between the taxes paid and the tax rate. Wald (1999) also considers that these inconsistent results may indeed be due to different measures of NDTS, referring that Breadley, Jarrell and Kim (1984) find a negative relationship perhaps because they do not include the amount of physical plant depreciation in their regressions. Bearing in mind that the most important NDTS is depreciation, we proxy NDTS using the depreciation ratio measured by depreciation divided by total assets. This ratio is commonly used by other researchers as a proxy for NDTS (i.e. Wald, 1999).

We also use the profitability variable ($PROFIT_{i,t}$). which is closely related to the pecking order theory. The pecking order theory denotes that firms will prefer internal funds to external financing. As a result, firms that are profitable

will use their internal funds (retained earnings) to finance their operations and investments and thus they will borrow relatively less than firms with low profitability. Therefore, we expect an inverse relationship between profitability and leverage. We measure profitability as the ratio of earnings before taxes divided by total assets.

Our last regressor is the size of the firm ($SIZE_{i,t}$). Size is closely related to risk and bankruptcy costs. Larger firms tend to be more diversified, which means that they enclose less risk and as a consequence they have a lower probability of bankruptcy. Furthermore, larger firms may be able to reduce transaction costs associated with long-term debt issuance and they will more easily attract a debt analyst to provide information to the public about the issue. Thus, banks will be more willing to lend their funds to larger firms. Examining the effect of size in the determination of capital structure, Marsh (1982) and Bennett and Donnelly (1993) found that larger and more capital intensive companies are likely to employ more debt. So, we expect that size will be positively related to leverage. We measure size as the natural logarithm of sales revenue. We use the natural logarithm so as to measure the trend of this specific variable in the determination of capital structure rather than the contribution of the absolute size. This way, we smooth the differences that may arise between large differences in sizes among the firms.

4. Empirical Analysis

a. Target capital structure determination

We use panel data to estimate the target capital structure of the listed firms. The use of a panel model instead of a cross-sectional regression allows us to investigate capital structure determinants for a number of years, thus making our results and conclusions more reliable over time.

Each year's capital structure depends upon the asset structure, the growth rate, the non-debt-tax-shields and the size of the firm. Modelling the Greek market according to the variables described in the previous section, we estimate the following model

$$DR_{i,t} = \beta_0 + \beta_1 AS_{i,t} + \beta_2 GROWTH_{i,t} + \beta_3 NDTS_{i,t} + \beta_4 PROFIT_{i,t} + \beta_5 SIZE_{i,t} + \varepsilon_{i,t}$$

Empirical results are presented in Table 1. Results are consistent with those found in international studies of capital structure determination. Specifically, the target debt ratio is positively correlated to asset structure, NDTS and size and negatively correlated to growth and profitability. Thus, larger firms and companies with more tangible assets tend to employ more debt, whereas profit-

able firms and companies with high growth rates employ less debt. Coefficients are all significant at the 1% level, except for the constant[1], and standard errors and covariance are White heteroscedasticity consistent.

TABLE 1

The target debt ratio regression

Dependent Variable: DR **Model:Total** **Method: GLS (Cross Section Weights)** **White Heteroskedasticity-Consistent Standard Errors & Covariance**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
AS	0.060081	0.018422	3.261393	0.0012
GROWTH	$-1.05X10^{-7}$	$3.31X10^{-7}$	-3.161492	0.0017
NDTS	0.332947	0.086785	3.836438	0.0001
PROFIT	-0.457040	0.109065	-4.190511	0.0000
SIZE	0.022339	0.000708	31.56606	0.0000
Weighted Statistics				
R-squared	0.746563	**Mean dependent var**		0.557465
Adjusted R-squared	0.744736	**S.D. dependent var**		0.383193
S.E. of regression	0.193603	**Sum squared resid**		20.80261
F-statistic	408.7225	**Durbin-Watson stat**		0.830142
Prob(F-statistic)	0.000000			

b. Leverage deficit and probability of acquisitions

In the previous stage of the analysis we calculated the target capital structure regression for the firms. Specifically, the target capital structure of each firm is the fitted value of this regression. In this stage we construct the leverage deficit variable and we use it to estimate its effect on the probability of acquiring a target firm. The construction of the probability variable is as follows. We rank the 112 firms according to their debt ratios and we capture the ranking of the 20 acquirers, within these 112 ranking places; so, we construct a variable of 20 probabilities, each one denoting how probable it is for one firm to proceed to an acquisition. For instance, at the level of a 0.20 debt ratio there are four acquirers of the total 14 firms; so the probability that a firm will become an acquirer is 0.2857.

The leverage deficit variable ($LEVDEF_i$) is defined as the actual debt ratio minus the estimated target leverage from the previous stage. Thus, a negative leverage deficit shows a deviation from the target capital structure towards a

1. We dropped the constant off the regression, because it was insignificant.

lower actual debt ratio, whereas a positive leverage deficit means that the firm is (actual ratio) more leveraged than it should be according to its target capital structure. This ratio is then used as a regressor of the probability of making an acquisition for the listed firms. However, note that univariate comparison is not sufficient, thus we resort to multivariate analysis including the effects of other determinants of acquisitions. Specifically, the dependent variable is the probability of acquiring a firm and the independent variables are the leverage deficit, the size of the firm ($SIZE_i$) and the firms' profitability ($PROFIT_i$). The rationale is that larger firms are more probable to acquire a firm, since they have both the potential and the motivation. More profitable firms will also be able to proceed to an acquisition, mainly because they will have higher earnings, and thus undistributed earnings to finance an acquisition. Thus our model contains observations for the 20 acquirers and variables are the mean values of the 1997-2002 period. Thus, our model is the following cross-sectional model

$$PROB_i = \beta_0 + \beta_1 LEVDEF_i + \beta_2 PROFIT_i + \beta_3 SIZE + \varepsilon_i$$

Table 2 reports the results[2]. Leverage deficit and size variables are statistically significant, whereas profitability is not statistically significant. The main conclusion is that leverage deficit is negatively related to the probability of making an acquisition. Bearing in mind that positive and higher leverage deficits mean overleveraged firms, it seems that when the leverage deficit increases (i.e. when firms are overleveraged) the probability of an acquisition decreases. This inverse relationship between leverage deficit and the probability of an acquisition shows that underleveraged firms are more probable to make an acquisition than overleveraged firms. Regarding the remaining two variables, larger firms do seem to be more able and thus probable to become acquirers, whereas the profitability variable is not significant. Our results and conclusions are consistent to those of Uysal (2006), confirming that leverage deficit seems to play an important role in M&As in Greece.

2. We dropped the constant off the regression, because it was insignificant.

TABLE 2

The probability of acquisition regression

Dependent Variable: PROB				
Method: Least Squares				
White Heteroskedasticity-Consistent Standard Errors & Covariance				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LEVDEF	-0.339030	0.073703	-4.599962	0.0003
PROFIT	-0.428699	0.305658	-1.402544	0.1788
SIZE	0.015560	0.001675	9.291943	0.0000
Weighted Statistics				
R-squared	0.496136	**Mean dependent var**		0.240746
Adjusted R-squared	0.436858	**S.D. dependent var**		0.059144
S.E. of regression	0.044384	**Akaike info criterion**		-3.254409
Sum squared resid	0.033488	**Schwarz criterion**		-3.105049
Log likelihood	35.54409	**Durbin-Watson stat**		1.479297

5. Conclusions

In this paper we investigate the relationship between a firm's deviation from its target capital structure and its acquisition decisions. We measure this deviation by constructing the leverage deficit variable which measures the deviation of the actual debt ratio from the target leverage ratio of the firms. The target leverage ratio is calculated over a period of five years considering the control variables of asset structure, growth, non-debt-tax-shields, profitability and size.

Results show that financial leverage plays an important role in the firm's choice to become an acquirer. We find that firms that are underleveraged relative to their target capital structure are more likely to make an acquisition. We also find that larger firms are also more likely to make an acquisition, whereas profitability does not seem to affect the firm's choice to become an acquirer.

References

Baker M. and J. Wurgler, (2000), "The equity share in new issues and aggregate stock returns", *Journal of Finance* 55, pp. 2219-2257.

Baker M. and J. Wurgler, (2002), "Market timing and capital structure", *Journal of Finance* 57, pp. 1-32.

Barton S.L., Hill C.H. and S. Sundaram, (1989), "An empirical test of Stakehloder Theory predictions of Capital Structure", *Financial Management* 18, pp. 36-44.

Bennett, M and R. Donnelly, (1993), "The Determinants of Capital Structure: Some UK Evidence", *British Accounting Review* 25, pp. 43-59.

Bradley M., Jarrell G. and E. H. Kim, (1984), "On the Existence of an Optimal Capital Structure: Theory and Evidence", *Journal of Finance* 39, pp. 857-878

DeAngelo H. and R. W. Masulis, (1980), "Optimal capital structure under corporate and personal taxation", *Journal of Financial Economics* 8, pp. 3-29.

DeMiguel A. and J. Pindado, (2000), "Determinants of Capital Structure: New Evidence from Spanish Panel Data", *Journal of Corporate Finance* 7, pp. 77-99.

Flannery M.J. and K.P. Rangan, (2006), "Partial Adjustment toward Target Capital Structures", *Journal of Financial Economics* 79, pp. 469-506

Graham J.R. and C. Harvey, (2001), "The theory and practice of corporate finance: evidence from the field", *Journal of Financial Economics* 60, pp. 187-243.

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

Grier P. and E. Zychowicz, (1994), "Institutional investors, corporate discipline, and the role of debt", *Journal of Economics and Business* 46, pp. 1-11.

Harford J., Klasa S. and N. Walcott, (2007), "Do Firms have Leverage Targets? Evidence from Acquisitions", *working paper*.

Hovakimian A., Opler T. and S. Titman, (2001), "The debt-equity choice", *Journal of Financial and Quantitative Analysis* 36, pp. 1-24.

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

Kayhan A. and S. Titman, (2007), "Firms' Histories and Their Capital Structures", *Journal of Financial Economics,* forthcoming.

Leary M.T. and M.R. Roberts, (2005), "Do Firms Rebalance Their Capital Structures?", *Journal of Finance* 60, pp. 2575-2619.

Marsh P., (1982), "The choice between equity and debt: An empirical study", *Journal of Finance* 37, pp. 121-144.

Modigliani F. and M. Miller, (1963), "Corporate Income Taxes and the Cost of Capital: A Correction (in Communications)", *American Economic Review* 53, pp. 433-443.

Myers S.C., (1977), "Determinants of Corporate Borrowing, *Journal of Financial Economics* 5, pp. 147-175.

Myers S.C., (1984), "The Capital Structure Puzzle", *Journal of Finance* 39, pp. 575-592.

Myers S.C. and N.S. Majluf, (1984), "Corporate financing and investment decisions when firms have information that investors do not have", *Journal of Financial Economics* 13, pp. 187-221.

Rajan R.G. and L. Zingales, (1995), "What do we know about capital structure? Some evidence from international data", *Journal of Finance* 50, pp. 1421-1460.

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

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

Titman S. and R. Wessels, (1988), "The Determinants of Capital Structure Choice", *Journal of Finance* 43, pp. 1-19.

Uysal, Vahap B., (2006), "Deviation from the Target Capital Structure and Acquisition Choices", AFA 2007 Chicago Meetings Paper.

Vasiliou, D. Eriotis, N. and Daskalakis, N, (2006), Testing the Pecking Order Theory: The Importance of Methodology", *working paper.*

Vasiliou D. and N. Daskalakis, (2005), "Investigating the Capital Structure of Greek Firms: Some Preliminary Evidence", *Les Cahiers du Pole des Etudes des Politiques Sociales et Economiques (PEPSE)*.

Wald J., (1999), "How Firm Characteristics Affect Capital Structure: An International Comparison", *Journal of Financial Research* 22, No. 2, Summer, pp. 161-187.

Yook K., (2003), "Larger Return to Cash Acquisitions: Signalling Effect or Leverage Effect", *Journal of Business* 76, pp. 477-498.