African Journal of Business Management Vol. 4(11), pp. 2216-2230, 4 September, 2010
Available online at http://www.academicjournals.org/AJBM
ISSN 1993-8233 ©2010 Academic Journals

Full Length Research Paper

Are trade-off and pecking order theories mutually exclusive in explaining capital structure decisions?

Zélia Serrasqueiro and Paulo Maçãs Nunes*

Department of Management and Economics, Beira Interior University, Covilhã, Portugal.
CEFAGE – UE (Center for Advanced Studies in Management and Economics), Portugal.

Accepted 30 July, 2010

In this study, using various panel models and estimators, we find empirically that the trade-off and pecking order theories are not mutually exclusive in explaining quoted Portuguese companies capital structure decisions. However, the finance behaviour of quoted Portuguese companies comes close to that forecast by the pecking order theory: (i) the magnitude of the effects of financial deficit on debt is clearly greater than the magnitude of the adjustment of actual level of debt towards optimal level of debt; and (ii) information asymmetry seems to have special emphasis in companies' capital structure decisions. On the contrary, the attempt for a trade-off between debt tax shields and bankruptcy costs seems to have little relevance in explaining the capital structure of quoted Portuguese companies. The results also suggest that the preference of quoted Portuguese companies is for internal funds rather than debt. However, when internal funds are insufficient, companies use debt to finance high growth opportunities and the need associated with dividends payment.

Key words: Capital structure, pecking order theory, quoted Portuguese companies, trade-off theory.

INTRODUCTION

Following the studies by Modigliani and Miller (1958, 1963) appeared the line of research usually referred to as trade-off theory (Kraus and Litzenberger, 1973; Scott, 1977; Kim, 1978). According to trade-off theory, companies' capital structure decisions point towards a target debt ratio, where debt tax shields are maximized and bankruptcy costs associated with the debt are minimized. Pecking order theory (Myers, 1984; Myers and Majluf, 1984) advocates that companies in its capital structure decisions do not search for a target debt ratio, but the level of debt is determined by the need to finance growth opportunities, when internal finance is exhausted.

For quoted companies, empirical evidence concerning direct confrontation between trade-off and pecking order theories, have focused on companies in countries with market-based financial systems that have a tradition to get finance in the stock market. Shyam – Sunder and Myers (1999), for USA quoted companies, conclude that capital structure decisions are close to what is forecast by pecking order theory. However, Dang (2005), for British quoted companies, conclude that the capital structure decisions are closer to what is predicted by trade-off theory. Surprisingly, the results of studies focusing on companies of other countries with similar financial systems are not convergent with a concern for the relative importance of the pecking order and trade-off theories in the explanation of capital structure decisions.

The Portuguese stock market is a little developed and lacks dynamism. As a result, the low number of companies with quotation depends fundamentally on debt for finance, when retained profits are exhausted. The lesser tradition of Portuguese companies acquiring finance in the stock market, even compared to other countries with bank-based financial systems and a framework of civil laws, such as Spain or Italy, may contribute to a high

*Corresponding author. E-mail: macas@ubi.pt. Tel: +351275319600. Fax: +351275319601.

JEL classification: G32.

dependence of quoted Portuguese companies on debt, when retained profits are insufficient (CMVM, 2007). Consequently, it seems to be admissible that the quoted Portuguese companies follow the pecking order theory in their capital structure decisions.

However, a dynamic approach of capital structure decisions involves the possibility that companies adjust their level of debt towards to a target debt ratio (Frank and Goyal, 2007). In this context, Leary and Roberts (2005) identify a dynamic adjustment of companies towards a target capital structure in the presence of adjustment costs. Strabulaev (2004) shows that companies do not rebalance their capital structure all the time due to the presence of adjustment costs. Various studies in European and United States quoted companies' context, conclude that the companies adjust the actual level of debt towards a target debt ratio, thereby corroborating to what is forecast by the trade – off theory (Shyam -Sunder and Myers, 1999; De Miguel and Pindado, 2001; Ozkan, 2001; Dang, 2005).

Regarding the direct confrontation between trade-off and pecking order theories, the empirical studies have focused on companies quoted in the most developed stock markets (namely, United States of America and United Kingdom), neglecting the companies of the less developed stock markets.

The current study aims to reduce this gap of empirical literature, hence, the main objective of the study is to analyse the capital structure decisions of quoted Portuguese companies from the perspective of two competing, but not necessarily, mutually exclusive theories: the trade-off theory and the pecking order theory. The data were obtained for a sample of 39 quoted Portuguese companies for the period between 1998 and 2006.

Aiming to test the trade-off theory, we consider three models: (1) the general model of partial adjustment, which enabled the study to determine the degree of adjustment of actual debt towards a target debt ratio; (2) the error correcting model, which enabled the study to break down the degree of adjustment of actual debt towards optimal debt. In this way, the robustness of the results obtained with the partial adjustment model was tested; and (3) using the LSDVC (2005) dynamic estimator, we extend the partial adjustment model, thereby considering the determinants suggested by the trade-off theory (profitability, size, asset tangibility, non-debt tax shields, effective rate of tax, risk and growth opportunities).

To test pecking order theory, we consider two different models: (1) the model proposed by Shyam - Sunder and Myers (1999), considering the relationship between debt variation and financial deficit; and (2) in a second model, in which debt is dependent on cash flow, size, growth opportunities and dividends.

Finally, we present models that allow the study to test, together, which theory (trade-off or pecking order theory) better explains the capital structure decisions of quoted Portuguese companies concerning their capital structure: (1) We test together the partial adjustment and error correcting models and the relationship between debt variation and financial deficit; and (2) We present the partial adjustment model by using the LSDVC (2005) dynamic estimator, considering all the relevant determinants, according to trade-off and pecking order theories, in explaining the debt of quoted Portuguese companies. The current study is structured as follows:

After introduction, the models for testing according to trade-off and pecking order theories, and the models that allowed it to set the two theories against each other were presented. Also, it raised the hypotheses for investigation. Subsequently, the database used in the study was presented, as well as the empirical results of the study, whereby the previously raised hypotheses that were confirmed were seen. Finally, it presented the main conclusions.

TRADE-OFF VERSUS PECKING ORDER THEORY

Next, we present models of analysis concerning capital structure theories: first, we present the models referring to trade-off theory and afterwards, we present the models referring to pecking order theory. Finally, the models that allowed the study to set the trade-off and pecking order theories against each other were presented.

Trade-off theory

Adjustment of the actual level of debt towards the target debt ratio

Now, the partial adjustment and error correcting models that allowed the study to test the degree of adjustment of actual debt towards a target debt ratio are presented, as well the research hypothesis according to trade – off theory. The partial adjustment model is given by:

$$D_{i,t} - D_{i,t-1} = \alpha(D_{i,t}^{*} - D_{i,t-1}) \quad (1)$$

in which $D_{i,t}$ is the level of debt of company *i* in the period *t*, given by the ratio of book value of total debt (book value of short – term debt plus book value of long – term debt) to total assets; $D_{i,t-1}$ is the debt of company *i* in period *t-1;* $D_{i,t}^{*}$ is the target debt ratio of company *i* in period *t*; α is the speed of adjustment of the actual level of debt towards a target debt ratio.

If $\alpha = 1$, we have $D_{i,t} = D_{i,t}^{*}$, that is, actual debt is equal to optimal debt. In these circumstances, we would be in the "perfect world" of Modigliani and Miller, with neither information asymmetry nor transaction costs. On the other hand, if $\alpha = 0$, we have $D_{i,t} = D_{i,t-1}$, in which

the level of debt does not change from the previous period to the current one, and so there is no adjustment whatsoever of actual debt towards optimal debt. In these circumstances, we can conclude that the company does not try to find its target debt ratio. Finally, if $\alpha > 1$, we can conclude that the companies have too much debt and do not find their target debt ratio.

To test the robustness of the results obtained by the partial adjustment model, we use the error correcting model. Formally, the model is given as:

$$D_{i,t} - D_{i,t-1} = \alpha(D_{i,t}^* - D_{i,t-1}^*) + \delta(D_{i,t-1}^* - D_{i,t-1}) \quad (2)$$

where $0 \leq \alpha, \delta \leq 1$.

We can say that the error correcting model is a generalized version of the partial adjustment model, since if $\alpha = \delta$, then Equation (2) is identical to Equation (1).

To estimate the above equations, it is necessary to find the target debt ratio, which is not directly observable. In this study, we consider, just as Shyam -Sunder and Myers (1999), De Miguel and Pindado (2001), Ozkan (2001), Fama and French (2002) and Gaud et al. (2005), that optimal debt depends on companies' specific characteristics. Therefore, a company's target debt ratio is given by:

$$D_{i,t}^* = \sum_{K=1}^{n} \varphi_K Z_{k,i,t} + u_i + d_t + v_{i,t}, \quad (3)$$

in which $Z_{K,i,t}$ is the determinant *k* of the book value of debt of company *i* at time *t*, φ_K are the coefficients of each debt determinant, u_i are companies' specific factors that are not directly observable from debt determinants, d_t represents temporal effects concerning possible changes in the economic situation and $v_{i,t}$ is the error which is assumed to have a mean of zero and a constant variance.

On the basis of the framework of trade-off theory, we consider the following determinants of debt: profitability ($PROF_{i,t}$), given by the ratio of earnings before interest and taxes to total assets; size ($SIZE_{i,t}$), being given by the natural logarithm of sales; asset tangibility ($TANG_{i,t}$), given by the ratio of tangible assets to total assets; non-debt tax shields ($NDTS_{i,t}$), being given by the ratio of depreciation to total assets; effective tax rate ($ETR_{i,t}$), being given by the ratio of actual income tax paid to net taxable income before taxes; level of risk ($EVOL_{i,t}$), given by the absolute value of the first difference of percentage change of earnings before interest, taxes and depreciations; and growth opportunities ($GO_{i,t}$), given by the Tobin q ratio, this being given by the quotient between market value of equity plus book value of assets, less book value of equity and book value of assets.

Finally, we present the partial adjustment model, considering the determinants that, according to trade-off theory, influence companies' decisions about capital structure decisions.

Substituting (3) in (1) and regrouping the terms, we have:

$$D_{i,t} = \lambda_0 D_{i,t-1} + \sum_{K=1}^{n} \beta_K Z_{k,i,t} + \eta_i + \theta_t + \varepsilon_{i,t} \quad (4)$$

where $\lambda_0 = (1-\alpha)$, $\beta_K = \alpha\varphi_K$, $\eta_i = \alpha u_i$, $\theta_t = \alpha d_t$, and $\varepsilon_{i,t} = \alpha v_{i,t}$.

Concerning the estimation of the models presented above, we estimated Equations (1) and (2), referring respectively, to the partial adjustment and error correcting models, by an OLS regression, since the dependent variables are presented in variations. In this way, the companies' non-observable individual effects were eliminated.

A target debt ratio, expressed by Equation (3), is estimated considering the companies' non-observable individual effects and debt determinants proposed by the trade-off theory.

Regarding the estimation of Equation (4), given the rather low number of observations, the use of GMM (1991) and GMM system (1998) dynamic estimators would lead to a sufficiently high number of instruments when compared to the number of companies, to a mean bias of the estimated parameters. Therefore, taking advantage of the quite recent developments in dynamic estimators to estimate Equation (4), we turn to the LSDVC (2005) dynamic estimator, proposed by Bruno (2005). Given the rather low number of companies, this estimator is the most appropriate one to estimate the partial adjustment model, considering all the determinants proposed by the trade-off theory. However, the study considers correction of the results obtained by Anderson and Hsiao (1982), GMM (1991) and GMM system (1998) estimators.

Based on the trade-off theory, concerning the companies' adjustment towards a target debt ratio and the expected relationships between debt and its determinants, the following hypothesis were formulated:

H_{1a}: Companies adjust their actual level of debt towards a target debt ratio (Lev and Pekelman, 1975; Ang, 1976; Taggart, 1977; Jalilvand and Harris, 1984).
H_{1b}: The most profitable companies turn more to debt (Kraus and Litzenberger, 1973; Scott, 1977; Kim, 1978).

H_{1c}: Larger companies resort more to debt (Rajan and Zingales, 1995).
H_{1d}: Companies with higher level of tangible assets turn more to debt (Myers, 1977; Scott, 1977; Myers and Majluf, 1984; Harris and Raviv, 1991).
H_{1e}: Companies with greater non-debt tax shields turn less to debt (DeAngelo and Masulis, 1980).
H_{1g}: Companies with a higher level of risk turn less to debt (Bradley et al., 1984; Mackie – Mason, 1990).
H_{1h}: Companies with higher growth opportunities resort less to debt (Jensen and Meckling, 1976; Myers, 1977; Stulz, 1990; McConnell and Servaes, 1995; Barclay et al., 2006).

Pecking order theory

Relationship between financial deficit and debt

To test the pecking order theory, we use the model proposed by Shyam - Sunder and Myers (1999). The model consists of a regression between debt variation and financial deficit. The estimation model is presented as follows:

$$\Delta D_{i,t} = \beta_0 + \beta_{POT} FD_{i,t} + \varepsilon_{i,t}, \quad (5)$$

in which $\Delta D_{i,t}$ is the difference between debt in both the current and previous periods ($D_{i,t} - D_{i,t-1}$), $FD_{i,t}$ is the financial deficit, which equals to the variation of fixed assets plus variation of working capital, dividends payments, variation of long term debt minus cash flow and $\varepsilon_{i,t}$ is the error, which is assumed to have a mean of zero and constant variance.

According to pecking order theory, companies resort to debt when internal funds are insufficient. Companies do not adjust their actual level of debt towards a target debt ratio, but rather according to their financial needs. Based on these arguments, the following hypothesis was formulated:

H_{2a}: Companies only adjust their level of debt according to their financial deficit, that is, $\beta_0 = 0$ and $\beta_{POT} = 1$ (Shyam - Sunder and Myers, 1999).

Relationships between financial determinants and debt

Finally, we test pecking order theory, by considering a regression between company debt (at level) and the debt determinants proposed by pecking order theory. The model for estimation is given by:

$$D_{i,t} = \beta_0 + \beta_1 CF_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 DIV_{i,t} + \beta_4 HGOLCF_{i,t} + \\ + \beta_5 LGOHCF_{i,t} + u_i + d_t + \varepsilon_{i,t}, \quad (6)$$

in which $CF_{i,t}$ corresponds to cash flow, given by the ratio between earnings after interests and taxes plus depreciations to total assets; $DIV_{i,t}$, is the ratio of dividends payments to equity; $HGOLCF_{i,t}$, are the growth opportunities of companies (i), at a given moment (t), that correspond to situations of high growth opportunities and low cash flow; $LGOHCF_{i,t}$, are the growth opportunities of companies (i), at a given moment (t), corresponding to situations of low growth opportunities and high cash flow.

To calculate $HGOLCF_{i,t}$, we consider initially a dummy variable that has: the value of 1 corresponding to companies that, at a given moment, have simultaneously, growth opportunities above the median of growth opportunities of the total sample and cash flows under the median of cash flow of the total sample; and the value of 0 in the remaining situations. To calculate $LGOHCF_{i,t}$, we consider, initially, a dummy variable with the value of: 1 when companies, at a given time, have simultaneously, growth opportunities under the median of growth opportunities of the total sample and cash flows above the median of cash flows of the total sample; and the value of 0 in the remaining situations. Finally, to calculate variables $HGOLCF_{i,t}$ and $LGOHCF_{i,t}$, we multiply the previously calculated dummy variables by the Tobin q ratio (considered as a measure of growth opportunities).

Considering the expected relationships according to pecking order theory, between the determinants presented above and debt, the following hypotheses were formulated:

H_{2b}: Companies with higher cash flow turn less to debt (Myers, 1984; Myers and Majluf, 1984).
H_{2c}: Larger companies resort more to debt (Myers, 1984).
H_{2d}: Companies with higher dividends payment turn more to debt (Baskin, 1989).
H_{2ea}: Companies with high growth opportunities and low cash flow resort more to debt (Myers, 1984).
H_{2eb}: Companies with low growth opportunities and high cash flow resort less to debt (Myers, 1984).

Aiming to test the model represented by Equation (5), given the dependent variable in the first differences, we use OLS regression, since the dependent variable is presented in variations. In that way, the companies' non-observable individual effects were eliminated.

As for estimation of the model concerning Equation (6), we use static panel models, namely: an OLS regression, a random effect model and a fixed effect model. To verify the most appropriate way to carry out the estimation of the relationship between debt and its determinants, we use both the LM and Hausman test. We present the most appropriated estimation methodology according to the existence of the first order autocorrelation.

Trade-off versus pecking order theory

Next, models that allow the study to test trade-off and pecking order theories, simultaneously, were presented. Initially, we consider the simultaneous estimation of the partial adjustment and error correcting models and the Shyam - Sunder and Myers (1999) model. The regressions estimated are:

$$D_{i,t} - D_{i,t-1} = \beta_0 + \beta_{POT} FD_{i,t} + \alpha(D_{i,t}^* - D_{i,t-1}) + \varepsilon_{i,t} \quad (7)$$

$$D_{i,t} - D_{i,t-1} = \beta_0 + \beta_{POT} FD_{i,t} + \alpha(D_{i,t}^* - D_{i,t-1}^*) + \delta(D_{i,t}^* - D_{i,t-1}) + \varepsilon_{i,t} \quad (8)$$

To set trade-off and pecking order theories against each other, we follow the methodology proposed by Dang (2005), analysing what the dominant effect is in the regressions that are presented already. For this purpose, just as before, we use OLS regressions for estimation of the equations.

To test the robustness of the results obtained by regressions (7) and (8), we set trade-off and pecking order theories against each other by including financial deficit in the partial adjustment model, estimated by the LSDVC (2005) dynamic estimator. We also consider all the debt determinants proposed by trade-off and pecking order theories. Therefore, the model is presented as follows:

$$D_{i,t} = \lambda_0 D_{i,t-1} + \beta_{POT} FD_{i,t} + \sum_{K=1}^{n} \beta_K Z_{k,i,t} + \eta_i + \theta_t + \varepsilon_{i,t}, \quad (9)$$

where in these circumstances, the debt determinants making up $Z_{k,i,t}$, are: $PROF_{i,t}$, $SIZE_{i,t}$, $TANG_{i,t}$, $NDTS_{i,t}$, $ETR_{i,t}$, $EVOL_{i,t}$, $DIV_{i,t}$, $GO_{i,t}$, $HGOLCF_{i,t}$ and $LGOHCF_{i,t}$. The cash flow was included in the partial adjustment model estimated by the LSDVC (2005) dynamic estimator due to the evident correlation between cash flow and profitability.

The capital structure decisions of companies with fair tradition to search financing in the stock market, may be explained on the basis of two fundamental factors: (i) the dependence on internal finance leads to the possibility that the level of debt depends on the financial deficit; and (ii) the dependence on debt, due to the insufficiency of internal resources, leads to the possibility of companies to adjust its level of debt towards a target debt ratio. Therefore, the trade-off and pecking order theories are not necessarily mutually exclusive.

If the adjustment of the actual level of debt towards a target debt ratio and the magnitude of the impact of financial deficit on debt variations are different to zero ($\beta_{POT} \neq 0$ and $\alpha \neq 0$), we conclude that both the trade–off and pecking order theories are not mutually exclusives.

If the magnitude of adjustment of the actual level of debt towards a target debt ratio is more than the magnitude of the impact of financial deficit on debt variations ($\alpha > \beta_{POT}$), we conclude that company behaviour, concerning capital structure decisions, comes closer to trade-off than pecking order theory.

On the other hand, if the magnitude of the impact of financial deficit is more than the magnitude of the adjustment of actual level of debt towards a target debt ratio ($\beta_{POT} > \alpha$), we conclude that companies' decisions about their capital structure are closer to what is proposed by pecking order theory than trade-off theory. Consequently, the following hypotheses were formulated:

H_{3a}: The trade – off and pecking order theories are not mutually exclusive.
H_{3b}: If the magnitude of the adjustment of actual level of debt towards a target debt ratio is more than the debt variations, as a consequence of financial deficit, a company's behaviour concerning capital structure decisions is closer to what is forecast by trade-off theory.
H_{3c}: If the magnitude of debt variations, as a consequence of financial deficit is greater than the magnitude of adjustment of actual level of debt towards a target debt ratio, the company's behaviour concerning capital structure decisions is closer to what is forecast by pecking order theory.

DATABASE (METHODOLOGY)

This study uses the SABI (Sistema de Balanços Ibéricos - Analysis System of Iberian Balance Sheets) database supplied by Bureau van Dijk, which contains the annual financial statements of quoted Portuguese companies. The Portuguese stock market resumed in the second half of the eighties, after a long interval following the fall of the dictatorship in 1974. The market reopened in 1986, showing relative dynamism with more than 100 new companies joining the share market in the period between 1986 and 1987. However, after the crash in 1987, the number of companies trading on the Portuguese stock market decreased significantly. The lack of dynamism in the Portuguese stock market, the low frequency of quoted Portuguese companies in the use of stock market with funding purposes and the predominance of banks as the main external source of finance, is mirrored in the low number of quoted Portuguese companies making up the SABI database. Furthermore, the low number of quoted Portuguese companies is also related to the fact that 99.8% of Portuguese companies (National Statistics Institute, 2004) are small and medium-sized, in which majority do not accomplish the requirements needed to achieve flotation.

From the total number of companies on the SABI (Sistema de Balanços Ibéricos – Analysis System of Iberian Balance Sheets) database, we eliminated 4 financial companies and 2 football clubs, to be left with a total of 39 companies for the period of 1998 to 2006. It can be seen that not all companies joined the share market in 1998, and so, the panel obtained was not uniform.

In this study, the economic-financial data used were taken from the balance sheets and income statements of the companies selected from the SABI (Sistema de Balanços Ibéricos – Analysis System of Iberian Balance Sheets) database. Since in the period of 1986 – 1998, some economic-financial data were missing from the companies' database, we were forced to restrict this study to a

Table 1. Descriptive statistics.

	Mean	Standard deviation	Minimum	Maximum
$D_{i,t}$	0.6987	0.1512	0.2098	0.9980
$\Delta D_{i,t}$	0.0121	0.0948	-0.4628	0.3708
$FD_{i,t}$	-0.0321	0.2824	-1.9346	1.0366
$CF_{i,t}$	0.0605	0.1018	-0.9653	0.2260
$PROF_{i,t}$	0.0913	0.0607	-0.1845	0.2744
$SIZE_{i,t}$	19.566	1.6360	15.412	22.700
$TANG_{i,t}$	0.5702	0.1998	0.1273	0.9723
$NDTS_{i,t}$	0.0568	0.0284	0.0040	0.2205
$ETR_{i,t}$	0.1087	0.3732	-2.8374	1.5162
$EVOL_{i,t}$	0.4788	0.7767	0.0010	5.0117
$DIV_{i,t}$	0.0312	0.0774	0	0.9142
$GO_{i,t}$	1.3534	1.0024	0.43	12.88
$HGOLCF_{i,t}$	0.3588	0.6459	0	2.88
$LGOHCF_{i,t}$	0.0845	0.2519	0	0.99

period of analysis from 1998 to 2006, in order to obtain a greater consistency of the data. We considered 2006 as the final year of analysis, because it was the last year with available data in the database.

RESULTS

Descriptive statistics

Next, we present results of the descriptive statistics of the variables used in this study. These results are presented in Table 1.

Observing the descriptive statistics of the variables used in this study, we find that some variables: $\Delta D_{i,t}$, $FD_{i,t}$, $CF_{i,t}$, $ETR_{i,t}$, $EVOL_{i,t}$, $DIV_{i,t}$, $HGOLCF_{i,t}$ and $LGOHCF_{i,t}$, show considerable volatility since standard deviations are above the respective mean.

Trade-off theory

We now present the empirical results relating to the tests carried out on trade-off theory. In Table 2, we present the partial adjustment and error correcting models and in Table 3, we present the partial adjustment models with debt determinants proposed by the trade-off theory.

The empirical results obtained in this study allowed the study to validate the previously formulated hypothesis (H_{1a}), since the estimated parameter, according to different models, that measures the adjustment of actual level of debt towards a target debt ratio is always statistically significant. So we can conclude that quoted Portuguese companies adjust their actual level of debt towards a target debt ratio, that is, their aim is to reach a target debt ratio.

From the partial adjustment model and on the basis of the OLS regressions, it can be seen that adjustment of actual level of debt towards a target debt ratio is $\alpha = 0.2673$ (Table 2), whereas when estimated with the error correcting model, the adjustment is $\alpha = 0.2229$ (Table 2). We also find, from estimation with the error correcting model (Table 2), that the difference between actual level of debt and a target debt ratio is $\delta = 0.7563$.

When the partial adjustment model is estimated, using the LSDVC (2005) dynamic estimator (Table 3), it can be found that the adjustment of actual level of debt towards a target debt ratio varies between $\alpha = 0.2302$ and $\alpha = 0.3161$, according to correction of the initial dynamic estimator.

In the current study, although it can be concluded that quoted Portuguese companies adjust their actual level of debt towards a target debt ratio, we can see that adjustment is clearly low. Firstly, the adjustment of actual level of debt towards a target debt ratio varies, according

Table 2. Partial adjustment and error correcting models – OLS regressions: Test of trade-off theory.

Dependent variable ($\Delta D_{i,t}$)		
Independent variables	**I**	**II**
$D_{i,t}^{*} - D_{i,t-1}$	0.2673*** (0.0414)	
$\Delta D_{i,t}^{*}$		0.2229*** (0.0563)
$D_{i,t-1}^{*} - D_{i,t-1}$		0.7563*** (0.0266)
$CONS$	0.0189*** (0.0054)	0.0203*** (0.0098)
R^2	0.1593	0.2189
$F(N(0.1))$	41.98***	25.12***
N	268	265

(1) The second column refers to the partial adjustment model. (2) The third column refers to the error correcting model. (3) *** significant at 1% level; ** significant at 5% level; * significant at 10% level. (4) Standard deviations in brackets.

Table 3. Partial adjustment models with debt determinants – LSDVC (2005) dynamic estimator: Test of trade-off theory.

Dependent variable: $D_{i,t}$			
Independent variables	**I**	**II**	**III**
$D_{i,t-1}$	0.7394*** (0.1044)	0.6839*** (0.0803)	0.7698*** (0.0844)
$PROF_{i,t}$	-0.9673*** (0.2025)	-0.9334*** (0.1209)	-0.9505*** (0.1346)
$SIZE_{i,t}$	0.0904*** (0.0247)	0.0589*** (0.0117)	0.0890*** (0.0203)
$TANG_{i,t}$	0.1087 (0.0983)	0.1783 (0.2188)	0.1166 (0.1202)
$NDTS_{i,t}$	1.2009** (0.5892)	1.0817** (0.5304)	1.4343*** (0.3538)
$ETR_{i,t}$	-0.0142 (0.0398)	0.0089 (0.0107)	-0.0234 (0.0564)
$EVOL_{i,t}$	0.0056 (0.0298)	0.0182 (0.0199)	-0.0034 (0.0176)
$GO_{i,t}$	-0.0028 (0.0143)	0.0006 (0.0035)	0.0009 (0.0044)

Table 3. Cont'd

N	265	265	265

Notes: (1) The second column corresponds to estimation by the LSDVC (2005) dynamic estimator, correcting the results of Anderson and Hsiao (1982) dynamic estimator. (2) The third column corresponds to estimation by the LSDVC (2005) dynamic estimator, correcting the results of GMM (1991) dynamic estimator. (3) The fourth column corresponds to estimation by the LSDVC (2005) dynamic estimator, correcting the results of the GMM system (1998) dynamic estimator. (4) *** significant at 1% level; ** significant at 5% level; * significant at 10% level. (5) Temporal dummies are included in the estimations. (6) Standard deviations in brackets.

Table 4. Trade-off theory: Results of empirical tests to hypotheses.

Hypotheses	Expected relationship	Actual relationship	Hypotheses decision
H_{1a}: Companies adjust their actual level of debt towards optimal level of debt	+	+	Accepted
H_{1b}: The most profitable companies turn more to debt	+	-	Not accepted
H_{1c}: Larger companies resort more to debt	+	+	Accepted
H_{1d}: Companies with a higher level of tangible assets turn more to debt	+	n.s.	Not accepted
H_{1e}: Companies with greater non-debt tax shields turn less to debt	+	-	Not accepted
H_{1f}: Companies with higher tax rate resort more to debt	+	n.s.	Not accepted
H_{1g}: Companies with a higher level of risk turn less to debt	-	n.s.	Not accepted
H_{1h}: Companies with higher growth opportunities resort less to debt	-	n.s.	Not accepted

Notes: (1) + positive significant relationship between the variable and debt. (2) – negative significant relationship between the variable and debt. (3) n.s. non-significant relationship between the variable and debt.

to estimation method, between $\alpha = 0.2229$ and $\alpha = 0.3161$. Secondly, from estimation using the error correcting model, we see that in the previous period, the difference between actual level of debt and target debt ratio is quite considerable ($\delta = 0.7563$).

The adjustment of actual level of debt of quoted Portuguese companies towards a target debt ratio approaches the values obtained for French and Swiss companies, considering the study of Kremp et al. (1999) that obtained a level of adjustment of 0.28 for quoted French companies and Gaud et al. (2005) that obtained values between 0.14 and 0.387 for quoted Swiss companies. However, the adjustment of the actual level of debt of quoted Portuguese companies towards a target debt ratio is rather far from the adjustment levels verified in the studies of Shyam - Sunder and Myers (1999) that obtained an adjustment between 0.41 and 0.59 for quoted American companies; De Miguel and Pindado (2001), 0.79 for quoted Spanish companies; Ozkan (2001), 0.57 for quoted British companies and Dang (2005), an adjustment between 0.39 and 0.65, also for quoted British companies.

The results of the current study suggest that despite dealing with companies quoted on the stock market, Portuguese companies bear relevant transaction costs, likely, as a consequence of the information asymmetry in the relationship between shareholders/managers and creditors. Consequently, transaction costs are greater than the costs of unbalanced capital structure, and so, the adjustment towards a target debt ratio of quoted Portuguese companies is slower than that found in German, British, Spanish and USA companies.

The summary of these several relationships allow the study to accept or not the hypotheses formulated previously when considering the framework of the trade-off theory that are presented in Table 4.

The empirical results, except for the adjustment of actual level of debt towards a target debt ratio and for the relationship between size and debt, do not corroborate the relationships forecast by the trade-off theory.

The relationship between size and debt as well as the relationship between profitability and debt found in the current study corroborate the conclusions of several studies (Rajan and Zingales, 1995; Shyam - Sunder and Myers, 1999; De Miguel and Pindado, 2001; Ozkan, 2001; Frank and Goyal, 2003; Panno, 2003; Bevan and Danbolt, 2004; Dang, 2005; Gaud et al., 2005; Ojah and Manrique, 2005; Tong and Green, 2005).

However, the relationships between the remaining determinants and debt for quoted Portuguese companies go against the majority of empirical evidence of other studies. Dang (2005), for quoted British companies, finds a negative influence of non-debt tax shields of both risk and growth opportunities on debt, and a positive influence of asset tangibility on debt. Dang (2005) concludes that the relationships between determinants and debt suggest that British firms behave according to the trade-off theory. Concerning the relationship between effective rate of tax and debt, De

Table 5. Shyam-Sunder and Myers (1999) model and its extension – OLS regressions.

Dependent variable: $\Delta D_{i,t}$	
Independent variables	**I**
$FD_{i,t}$	0.7422*** (0.0566)
$CONS$	0.0677** (0.0323)
R^2	0.1354
$F(N(0.1))$	4.97***
N	268

Notes: (1) The second column refers to the Shyam-Sunder and Myers (1999) model. (2) ***significant at 1% level; ** significant at 5% level; *significant at 10% level. (3) Standard deviations in brackets.

Miguel and Pindado (2001), for quoted Spanish companies, obtain a positive relationship between the variables. Unlike what happens in the case of quoted Spanish companies, quoted Portuguese companies do not increase debt as a way of increasing tax benefits.

Pecking order theory

Here, the empirical results of the tests carried out on pecking order theory are presented. Table 5 refers to the Shyam - Sunder and Myers (1999) model, while Table 6 presents the results of a regression using static panel models, an approach that allows the study test empirically, the relationship between the determinants forecast by pecking order theory and level of debt.

Analysing first the results of the test of Shyam - Sunder and Myers (1999) model (Table 5), it was discovered that hypothesis H2a cannot be accepted, that is, debt variations of quoted Portuguese companies do not depend exclusively on their financial debt at any moment.

It can be seen that $\beta_0 > 0$ and $\beta_{POT} < 1$. However, an estimated value of $\beta_{POT} = 0.7422$ was obtained. This result indicates that for each monetary unit of increased financial deficit, Portuguese companies increase debt by 0.7422 monetary units. Although β_{POT} is not 1, it must still be considered a value indicating that the behaviour of quoted Portuguese companies, concerning capital structure decisions, is close to that predicted by pecking order theory. It should also be pointed out that the constant is not very far from 0, with an estimated value of $\beta_0 = 0.0677$, which is statistically significant at only 5% significance and not being so at 1% significance.

Shyam - Sunder and Myers (1999) estimated a value for β_{POT} between 0.69 and 0.80, that is, a value similar to that obtained in the current study (β_{POT} = 0.7422), in the context of quoted Portuguese companies. Dang (2005), for quoted British companies, obtains values for β_{POT} between 0.114 and 0.146, considerably less than those obtained in this study for quoted Portuguese companies.

As for the relationships forecast between the determinants and debt according to pecking order theory (Table 6), unlike what we found when testing trade-off theory, the majority of the results, except for the relationship between growth opportunities and debt for companies with low growth opportunities and high cash flow, indicate that quoted Portuguese companies behave according to what is predicted by pecking order theory.

Firstly, on the one hand, the negative relationship between cash flow and debt indicate the preference of quoted Portuguese companies for internal funds, rather than external capital. On the other hand, the positive relationship between size and debt indicate that greater company size seems to contribute to diminish information asymmetry in the relationship between shareholders/managers and creditors. These results corroborate the empirical evidence obtained in several studies (Rajan and Zingales, 1995; Shyam - Sunder and Myers, 1999; De Miguel and Pindado, 2001; Ozkan, 2001; Frank and Goyal, 2003; Panno, 2003; Bevan and Danbolt, 2004; Dang, 2005; Gaud et al., 2005; Ojah and Manrique, 2005; Tong and Green, 2005).

Secondly, the positive relationships between dividends payment and debt and growth opportunities and debt, for companies with high growth opportunities and low cash flow, indicate that quoted Portuguese companies in the insufficiency of cash flow, turn more to debt to take

Table 6. Test of POT- Static panel models.

Dependent variable: $LEV_{i,t}$				
Independent variables	**OLS**	**Random effects**	**Fixed effects**	**Random effects AR(1)**
$CF_{i,t}$	-0.3098*** (0.1282)	-0.2983*** (0.0714)	-0.3563*** (0.0943)	-0.3123*** (0.0876)
$SIZE_{i,t}$	0.0313*** (0.0098)	0.0299*** (0.0077)	0.0703*** (0.0214)	0.0661*** (0.0125)
$DIV_{i,t}$	0.3607*** (0.0982)	0.1652*** (0.0443)	0.1229*** (0.0287)	0.1447*** (0.0230)
$GO_{i,t}$	-0.0289** (0.0141)	0.0016 (0.0047)	0.0078 (0.0142)	-0.0009 (0.0034)
$HGOLCF_{i,t}$	0.0655*** (0.0190)	0.0622*** (0.0154)	0.0497*** (0.0141)	0.0468*** (0.0162)
$LGOHCF_{i,t}$	-0.0302 (0.0563)	-0.0098 (0.0148)	0.0374 (0.0481)	0.0192 (0.0301)
$CONS$	0.3434*** (0.0883)	0.0666 (0.2441)	-0.2736 (0.3778)	-0.1928** (0.0950)
R^2	0.1943	0.3742	0.3804	0.2198
$F(N0.1))$	7.33***		9.61***	7.12***
$WALD(\chi^2)$		57.10***		
$LM(\chi^2)$		195.76***		
$HAUS(\chi^2)$		21.23***		
N	304	304	304	265

Notes: (1) The LM test has χ^2 distribution and tests the null hypothesis of non-correlation between non-observable individual effects and the explanatory variables, as against the alternative hypothesis of correlation between non-observable individual effects and explanatory variables. (2) The Hausman test has χ^2 distribution and tests the null hypothesis of non-correlation between non-observable individual effects and explanatory variables, as against the alternative hypothesis of correlation between non-observable individual effects and explanatory variables. (3) ***significant at 1% level; ** significant at 5% level; * significant at 10% level. (4) Temporal dummies are included in the estimations. (5) Standard deviations in brackets.

advantage of high growth opportunities and fulfil the need to pay dividends. These results corroborate those obtained by Baskin (1989), for a sample of quoted USA companies.

The statistically insignificant relationship between growth opportunities and debt, for quoted Portuguese companies with low growth opportunities and high cash flow, does not corroborate the relationship forecast by pecking order theory or the results obtained by Baskin (1989) for quoted USA companies.

However, in Table 7, the summary results of empirical test to pecking order theory were presented.

With the exceptions for the relationships between the variation of debt and the financial deficit between debt and growth opportunities, when quoted Portuguese companies have low growth opportunities and high cash flow, the remaining empirical evidences corroborate the financing behaviour forecast by pecking order theory.

Trade-off versus pecking order theory

In Tables 8 and 9, the empirical results from setting trade-off

Table 7. Pecking order theory: Results of empirical tests to hypotheses.

Hypotheses	Expected relationship	Actual relationship	Hypotheses decision
H_{2a}: Companies only adjust their level of debt according to their financial deficit, that is, $\beta_0 = 0$ and $\beta_{POT} = 1$	$\beta_0 = 0$ and $\beta_{POT} = 1$	$\beta_0 \neq 0$ and $\beta_{POT} \neq 1$	Not accepted
H_{2b}: Companies with higher cash flow turn less to debt	-	-	Accepted
H_{2c}: Larger companies resort more to debt	+	+	Accepted
H_{2d}: Companies that pay high dividends turn more to debt	+	+	Accepted
H_{2ea}: Companies with high growth opportunities and low cash flow resort more to debt	+	+	Accepted
H_{2eb}: Companies with low growth opportunities and high cash flow resort less to debt	-	n.s.	Not accepted

Notes: (1) + positive significant relationship between the variable and debt. (2) – negative significant relationship between the variable and debt. (3) n.s. non-significant relationship between the variable and debt.

Table 8. Trade-off versus pecking order theory – OLS regressions.

Dependent variable: $\Delta D_{i,t}$		
Independent variables	**I**	**II**
$FD_{i,t}$	0.7045*** (0.0602)	0.6192*** (0.0487)
$D_{i,t}^{*} - D_{i,t-1}$	0.2679*** (0.0413)	
$\Delta D_{i,t}^{*}$		0.2906*** (0.0511)
$D_{i,t-1}^{*} - D_{i,t-1}$		0.7007*** (0.0202)
$CONS$	0.1080*** (0.0165)	0.0394*** (0.0087)
R^2	0.2249	0.3293
$F(N0.1))$	18.09***	22.02***
N	265	265

Notes: (1) The second column sets the partial adjustment model against the Shyam-Sunder and Myers (1999) model. (2) The third column sets the error correcting model against the Shyam-Sunder and Myers (1999) model. (3) ***significant at 1% level; ** significant at 5% level; * significant at 10% level. (4) Standard deviations in brackets.

and pecking order theories directly against each other were presented. Table 8 concerns the simultaneous presentation of the Shyam - Sunder and Myers (1999) model and the partial adjustment and error correcting models, while in Table 9, the results of the partial adjustment model, including the financial deficit variable, as well as all debt determinants forecast by trade-off and pecking order theories were presented.

The empirical evidence presented in Tables 8 and 9 corroborate those previous empirical evidences presented in Tables 2, 3, 5 and 6, indicating that quoted Portuguese companies are close to the behaviour forecast by pecking order Theory than with trade – off theory.

We find that the magnitude of the effect of financial deficit in debt variations is considerably above the level of

Table 9. Partial adjustment models with debt determinants, trade-off theory versus pecking order theory, by LSDVC (2005) dynamic estimator.

Dependent variable: $D_{i,t}$			
Independent variables	**I**	**II**	**III**
$D_{i,t-1}$	0.6789***	0.6649***	0.7283***
	(0.1298)	(0.0777)	(0.0863)
$FD_{i,t}$	0.5702***	0.5434***	0.5883***
	(0.0455)	(0.0589)	(0.0699)
$PROF_{i,t}$	-0.9290***	-0.9173***	-0.8543***
	(0.2372)	(0.2669)	(0.1708)
$SIZE_{i,t}$	0.0844***	0.0635***	0.0701***
	(0.0239)	(0.0122)	(0.0148)
$TANG_{i,t}$	0.0998	0.1277	0.0837
	(0.1144)	(0.1402)	(0.0945)
$NDTS_{i,t}$	1.6049***	1.8992***	1.4661***
	(0.5632)	(0.4569)	(0.3445)
$ETR_{i,t}$	0.0144	0.0154	0.0189
	(0.0297)	(0.0204)	(0.0229)
$EVOL_{i,t}$	0.0045	0.0012	0.0018
	(0.0198)	(0.0087)	(0.0076)
$DIV_{i,t}$	0.2331***	0.2206***	0.2998***
	(0.0407)	(0.0439)	(0.0655)
$GO_{i,t}$	0.0045	-0.0008	-0.0012
	(0.0276)	(0.0052)	(0.0082)
$HGOLCF_{i,t}$	0.0488***	0.0424***	0.0505***
	(0.0160)	(0.0128)	(0.0136)
$LGOHCF_{i,t}$	-0.0288	-0.0244	-0.0188
	(0.0444)	(0.0373)	(0.0396)
N	265	265	265

Notes: (1) The second column corresponds to estimation by the LSDVC (2005) dynamic estimator, correcting the results of the Anderson and Hsiao (1982) dynamic estimator. (2) The third column corresponds to estimation by the LSDVC (2005) dynamic estimator, correcting the results of the GMM (1991) dynamic estimator. (3) The fourth column corresponds to estimation by the LSDVC (2005) dynamic estimator, correcting the results of the GMM system (1998) dynamic estimator. (4) *** significant at 1% level; ** significant at 5% level; * significant at 10% level. (5) Temporal dummies are included in the estimations. (6) Standard deviations in brackets.

adjustment of actual level of debt towards a target debt ratio. On the one hand, the estimated value of the parameter, β_{POT}, varies between $\beta_{POT} = 0.5434$ (when we consider the estimation together with the partial adjustment model and debt determinants using LSDVC (2005) dynamic estimator) and $\beta_{POT} = 0.7045$ (when

Table 10. Trade-off versus pecking order theory: Results of empirical tests to hypotheses.

Hypotheses	Expected relationship	Actual relationship	Hypotheses decision
H_{3a}: Trade – off theory and pecking order theory are not mutually exclusive.	$\alpha \neq 0$ and $\beta_{POT} \neq 0$	$\alpha \neq 0$ and $\beta_{POT} \neq 0$	Accepted
H_{3b}: If the magnitude of the adjustment of actual level of debt towards optimal level of debt is more than debt variations, as a consequence of financial deficit, then the company's behaviour concerning capital structure decisions is closer to what is forecast by trade-off theory.	$\alpha > \beta_{POT}$	$\beta_{POT} > \alpha$	Not accepted
H_{3c}: If the magnitude of debt variations, as a consequence of financial deficit is greater than the magnitude of adjustment of actual level of debt towards optimal level of debt, then the company's behaviour concerning capital structure decisions is closer to what is forecast by pecking order theory.	$\beta_{POT} > \alpha$	$\beta_{POT} > \alpha$	Accepted

we estimate the partial adjustment model against the Shyam - Sunder and Myers (1999) model). On the other hand, the estimated value of α varies between $\alpha = 0.2679$, when we estimate the partial adjustment model against the Shyam – Sunder and Myers (1999) model, and $\alpha = 0.3351$, when we consider the estimation together with the partial adjustment model and debt determinants using LSDVC (2005) dynamic estimator.

Finally, concerning the estimated parameters referring to the difference between the actual level of debt and a target debt ratio, we find $\delta = 0.7007$. The results obtained showed that there were considerable differences between the actual level of debt and the target debt ratio of quoted Portuguese companies.

Concerning the relationships between debt and determinants, the empirical evidences obtained in Tables 8 and 9 corroborate the previous empirical evidences presented in Tables 3 and 6. Table 10 presents the summary of empirical test of hypotheses concerning the confrontation between trade-off and pecking order theories.

On the one hand, considering that the quoted Portuguese companies adjust their actual debt towards a target debt ratio ($\alpha > 0$), and on the other hand, that the variation of debt, for a given moment, is influenced by the financial deficit ($\beta_{POT} > 0$), hypothesis H3a was accepted as valid. Given that, trade-off and pecking order theories cannot be considered as mutually exclusive, in explaining quoted Portuguese companies capital structure decisions.

In this study, it was found that the magnitude of impact of financial deficit on debt is greater than the magnitude of adjustment of the actual level of debt towards a target debt ratio, that is, $\beta_{POT} > \alpha$. On the basis of this result, we accept hypothesis H3c, rejecting hypothesis H3b, given the greater magnitude of the effects of financial deficit on debt, compared to the magnitude of adjustment of the actual level of debt towards a target debt ratio. This result show that quoted Portuguese companies behave similarly to what is forecast by pecking order theory, and as result, it corroborates the empirical results obtained by Shyam - Sunder and Myers (1999) for quoted American companies ($\beta_{POT} > \alpha$), but contradicts the empirical results obtained by Dang (2005) for quoted British companies ($\alpha > \beta_{POT}$).

CONCLUSION

In this study, using various panel models and estimators, we test empirically if the behaviour of quoted Portuguese companies, concerning their capital structure decisions on the one hand is closer to that forecast by pecking order theory, or on the other hand, is closer to trade – off theory.

In general, in spite of analysing large companies quoted on the stock market, the empirical results suggest that information asymmetry plays an important role in the capital structure decisions of quoted Portuguese companies, since they behave more in accordance with what is forecast by pecking order theory than according to trade-off theory.

The magnitude of the impacts of financial deficit on quoted Portuguese company's debt is clearly greater than the magnitude of adjustment of the actual level of debt towards a target debt ratio. The results indicate that circumstantial insufficiency of internal finance is more relevant in explaining the variation of debt in quoted Portuguese companies than the attempt to find a target debt ratio. The results, concerning the magnitude of adjustment of debt towards the target debt ratio, suggest

that quoted Portuguese companies have high transaction costs associated with external capital, and as a result, bear inferior costs of disequilibrium.

The empirical relationships between the variables considered as explanatory by the two theories and debt also show that the behaviour of quoted Portuguese companies, concerning capital structure decisions, is closer to what is predicted by pecking order theory than to that predicted by trade-off theory.

The negative influence of cash flow and profitability on debt, and the positive influence of size, dividend payment and growth opportunities, when companies have high growth opportunities and low cash flow, allow the study to conclude that quoted Portuguese companies turn to debt above all, when internal funds are insufficient to finance high growth opportunities, or in the case of finance for dividends payment.

The non-existence of neither positive relationships between profitability and debt, effective tax rate and debt nor a negative relationship between non-debt tax shields and debt enabled the study to conclude that tax-deductible expenses do not seem to be relevant in explaining quoted Portuguese company's capital structure decisions, contradicting what is predicted by the trade-off theory. Furthermore, there is no positive relationship between debt and asset tangibility, and we do not identify a negative relationship between growth opportunities and debt nor a negative relationship between risk and debt. These results suggest that the probability of bankruptcy is not a fundamental aspect in explaining the quoted Portuguese companies concerning capital structure decisions, contrary to what is predicted by the trade-off theory.

However, the positive relationship between size and debt shows that reduced likelihood of bankruptcy, as a consequence of greater company size, may contribute to an increase in the level of debt; but increased debt, as a consequence of greater company size, can also have its origins in the diminished information asymmetry in the relationship between companies and creditors, as is predicted by pecking order theory. We can conclude that the preference for internal funds is clearly evident, as opposed to debt. The latter seems to be used, when internal funds are insufficient to finance high investment opportunities and to fulfil the need to pay dividends.

However, the results do not allow the study to conclude that quoted Portuguese companies behave strictly according to what is predicted by pecking order theory. In fact, debt variations are not exclusively caused by financial deficit needs, since despite the low value of adjustment level, the study still identified an adjustment of debt towards a target debt level, which is according to trade-off theory.

Therefore, despite the fact that the capital structure decisions of quoted Portuguese companies are close to what is forecast by the pecking order theory, we cannot conclude that the two competing theories (pecking order and trade-off theories) are mutually exclusive.

Future research may focus on a sample of companies, belonging to different countries, with the purpose of studying the specific influence of the financial system and legal framework upon the magnitudes of the adjustment of debt towards a target debt ratio, as well as it concerns the variations of debt as a function of financial deficit.

REFERENCES

Anderson T, Hsiao C (1982). Formulation and Estimation of Dynamic Models Using Panel Data, J. Econ., 18: 47-82.

Ang J (1976). The Intertemporal Behaviour of Corporate Debt Policy, J. Fin. Quantitative. Ana., 11: 555-566.

Barclay M, Smith C, Morellec E (2006). On the Debt Capacity of Growth Opportunities, J. Bus. 79: 37-59.

Baskin J (1989). An Empirical Investigation of the Pecking Order Hypothesis, Fin. Manage., 18: 26-35.

Bevan A, Danbolt J (2004). Testing for Inconsistencies in the Estimation of UK Capital Structure Determinants, Appl. Fin. Econ. 14: 55-66.

Bradley M, Jarrell G, Kim E (1984), On the Existence of an Optimal Capital Structure: Theory and Evidence, J. Fin., 39: 857-878.

Bruno G (2005). Approximating the Bias of LSDV Estimation for Dynamic Panel Data Models, Econ. Letters., 87: 361-366.

CMVM (2007). Relatório Anual sobre a Actividade da CMVM e sobre os Mercados de Valores Mobiliários: Lisboa, Portugal.pp. 74-78.

Dang V (2005). Testing the Trade – Off and Pecking Order Theories: Some UK Evidence, Working Paper, Leeds University Business School, Leeds, UK.

DeAngelo H, Masulis R (1980). Optimal Capital Structure Under Corporate and Personal Taxation, J. Fin. Econ., 8: 3-29.

De Miguel A, Pindado J (2001). Determinants of Capital Structure: New Evidence From Spanish Panel Data, J. Corporate. Fin., 7: 77-99.

Fama E, French K (2002). Testing Trade-Off and Pecking Order Predictions About Dividends and Debt, Rev. Fin. Stud., 15: 1-33.

Frank M, Goyal V (2003). Testing the Pecking Order Theory of Capital Structure, J. Fin. Econ., 67: 217-248.

Frank M, Goyal V (2007). Trade-Off and Pecking Order Theories of Debt, Handbook of Corporate Finance: Empirical Corporate. Fin., 2: 1-82.

Gaud P, Jani E, Hoesli M, Bender A (2005).The Capital Structure of Swiss Companies: an Empirical Analysis Using Dynamic Panel Data, European. Fin. Manage., 11: 51-69.

Harris M, Raviv A (1991). The Theory of Capital Structure, J. Fin., 46: 297-355.

Jalilvand A, Harris R (1984). Corporate Behaviour in Adjusting to Capital Structure and Dividend Targets: An Econometric Study, J. Fin., 39: 127-145.

Jensen M, Meckling W (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, J. Fin. Econ., 3: 305-360.

Kim E (1978), A Mean-Variance Theory of Optimal Capital Structure and Corporate Debt Capacity, J. Fin., 33: 45-63.

Kraus A, Litzenberger R (1973). A State-Preference Model of Optimal Financial Leverage, J. Fin. 28: 911-922.

Kremp E, Stöss E, Gerdesmeier D (1999). Estimation of a Debt Function: Evidence Form French and German Firm Panel Data, in Sauvé A, Scheuer M (eds), Corporate Finance in Germany and France (Frankfurt-am-Main and Paris: Deutsche Bundesbank and Banque de France.

Leary M, Roberts M (2005). Do firms rebalance their capital structures? J. Fin., 60: 2575–2619.

Lev B Pekelman D (1975). A Multiperiod Adjustment Model For the Firm's Capital Structure, J. Fin., 30: 75-92.

MacKie-Mason J (1990). Do Taxes Affect Corporate Financing Decisions?, J. Fin. 45: 1471-1493.

McConnell J, Servaes H (1995). Equity Ownership and the Two Faces of Debt, J. Fin. Econ., 39: 131-157.

Modigliani F, Miller M (1958). The Cost of Capital, Corporation Finance and Theory of Investment, Am. Econ. Rev., 48: 261-297.

Modigliani F, Miller M (1963). Corporate Income Taxes and the Cost of Capital: a Correction, Am. Econ. Rev., 53: 433-443.
Myers S (1977). The Determinants of Corporate Borrowing, J. Fin. Econ. 5: 147-176.
Myers S (1984). The Capital Structure Puzzle, J. Fin. 39: 575-592.
Myers S, Majluf N (1984). Corporate Financing and Investment Decisions When Firms Have Information That Investors do Not Have, J. Fin. Econ. 13: 187-221.
National Institute of Statistics (2004), http:/www.ine.pt, Lisboa, Portugal.
Ojah K, Manrique J (2005). Determinants of Corporate Debt Structure in a Privately Dominated Debt Market: a Study of the Spanish Capital Market, Appl. Fin. Econ., 15: 445-468.
Ozkan A (2001). Determinants of Capital Structure and Adjustment to Long Run Target: Evidence From UK Company Panel Data, J. Bus. Fin. Acc., 28: 175-198.
Panno A (2003). An Empirical Investigation on the Determinants of Capital Structure: the UK and Italian Experience, Appl. Fin. Econ., 13: 97-112.
Rajan R, Zingales L (1995). What do We Know About Capital Structure? Some Evidence From International Data, J. Fin., 50: 1421-1460.
Scott J (1977). Bankruptcy, Secured Debt, and Optimal Capital Structure, J. Fin., 32: 1-19.
Shyam - Sunder L, Myers S (1999). Testing Static Trade-Off Against Pecking Order Models of Capital Structure, J. Fin. Econ., 51: 219-44.
Strabulaev I (2004). Do Tests of Capital Structure Theory Mean What They Say?", Working Paper, Graduate School of Business, Stanford University.
Stulz R (1990). Managerial Discretion an Optimal Financing Policies, J. Fin. Econ. 26: 3-27.
Taggart R (1977). A Model of Corporate Financing Decisions, J. Fin., 32: 1467-1484.
Tong G, Green J (2005). Pecking Order or Trade – Off Hypothesis? Evidence on the Capital Structure of Chinese Companies, Appl. Econ., 37: 2179-89.