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Emerging Science Journal

Vol. 4, No. 6, December, 2020

Explanatory Factors of the Capital Structure

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Abstract

This paper presents an empirical study of the capital structure of Portuguese companies where the main objective is to find key explanatory factors for indebtedness decisions. The relations between indebtedness and its determinants are tested in the light of the Trade-Off Theory and the Pecking-Order Theory. The motivation of this work was to contribute to the scientific research on the influential determinants of the capital structure and to deepen the knowledge of the Portuguese market. The quantitative methodology is used, through an econometric model for panel data using accounting information of 55 Portuguese companies between 2014 and 2016. Statistical tests such as the F test, the Lagrange Multiplier Breusch-Pagan test and the Hausman test were used to identify the most appropriate method of estimation, which resulted in a panel data model with random effects for individuals. The findings of this study suggest that indebtedness have a positive relation with tangibility and the size of the company, which supports the Trade-Off Theory. However, the positive relationship with the non-debt tax benefits suggests the importance of taxes, contrary to Trade-Off Theory. The negative relationship with cash flows, coupled with the positive relationships between size and growth opportunities, suggest the use of funding only when internal funds become insufficient, supporting the Pecking-Order Theory. The general results support that both theories partially explain the financing decisions of Portuguese companies.

Keywords:

Capital Structure;
Trade-Off Theory;
Pecking Order Theory;
Indebtedness.

Article History:

Received:	11	July	2020
Accepted:	29	November	2020
Published:	01	December	2020

1- Introduction

There are several theories on capital structure to understand the factors that justify corporate financing decisions. However, there is no consensus on the determinants of the structure, nor on the best explanatory theory of behavior in the choice of financing. This problem was driven by the theory proposed by Modigliani and Miller in 1958, based on perfect markets, and improved in 1963. Subsequently, other trends emerged, notably Trade-off Theory (TOT) and Pecking Order Theory (POT). The motivation of this work was to contribute to the scientific research on the influential determinants of the capital structure and to deepen the knowledge of the Portuguese market.

The main objective of the study is to test empirically which determinants exert influence over indebtedness, if these factors fit the referred theories, and which one tends to be followed by corporations in decisions about capital structure. For this, the quantitative methodology is used, through an econometric model with panel data. The traditional theory holds that there is an optimal combination of equity and debt in order to maximize the firm's market value by minimizing the weighted average cost of capital [1].

In opposition, Modigliani and Miller (1958) [2] defended the theory of the irrelevance of the capital structure, with the assumption of perfect markets. Proposition I states that the market value of a company is independent of its capital structure; proposition II establishes that the expected shareholder return of an indebted company increases proportionally to the debt ratio. Following criticisms for the lack of consideration of taxes, bankruptcy costs, agency

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DOI: http://dx.doi.org/10.28991/esj-2020-01249

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costs, transaction costs and costs of adverse selection [3], the authors Modigliani and Miller (1963) [4] reformulated the previous model in view of market imperfections, emphasizing the advantages of the tax benefits of debt. Despite the limitations, the model raised attention to the reasons for the importance of business leverage [5] and influenced the emergence of new theories [3], namely TOT, the Agency theory [6], Free Cash Flow theory [7], Signaling theory [8] and POT [9, 10]. Among these, research has highlighted TOT and POT, to which will be given focus in this article.

Managers believe in the worst-case about the expected risk-adjusted EBIT behavior, implying a distortion of restructuring likelihood. This essential feature justifies that companies display a weaker willingness to readjust leverage by choosing a slower pace and smaller size of adjustment [11]. On the other hand, Liu et al. (2019) [12] showed that executive compensation motivates CEOs to pursue more aggressive capital structure policy. Even so, the larger leverage is due to better access to debt, which results in lower rebalancing costs [13].

1-1- Trade-off Theory

The static TOT was first modelled by Kraus and Litzenberger (1973) [14] and Scott (1976) [15], followed by Kim [16]. The analysis of TOT by Jensen and Meckling (1976) [6] was based on the balance between tax effects, agency costs and bankruptcy costs. Kraus and Litzenberger (1973) [14] show that the value of an indebted company is equal to the value of the non-indebted company plus the difference between tax benefits and bankruptcy costs. This means that the company will put itself in debt to the (optimal) point where the marginal tax benefit on additional debt compensates for the increase in the current value of financial distress costs* [9, 17]. Thus, companies are looking for an optimal capital structure that maximizes the benefits and minimizes the costs associated with debt [3].

The existence of financial distress costs contradicts the idea of a capital structure financed exclusively by third party resources [17]. Bessler et al. (2011) [19] argue that companies with higher risk (volatile cash flows), with a higher proportion of intangible assets and with more growth opportunities, should be less indebted. On the other hand, Titman and Wessels (1988) [20] and Frank and Goyal (2009) [3] argue, respectively, that larger companies and more profitable companies face lower financial distress costs and should present more indebtedness.

1-2- Pecking Order Theory

POT was developed by Myers and Majluf (1984) [10] based on the asymmetry of information proposed by Ross [8]. This author established the signaling theory, based on the problem of information asymmetry between managers and investors, according to which borrowing provides information on the state of the cash flow, consisting of a way of communicating risks and profitability to investors. In this context, managers do not seek a particular (optimal) capital structure. Financing options are driven by the costs of adverse selection due to information asymmetry, giving rise to a hierarchy in the choice of sources [10]:

- Internally generated resources (retention of profits);
- Resort to indebtedness;
- Issuance of stocks.

This hierarchy presupposes that the company's actions generate a signal to the market, with less information-asymmetric features being preferred, in order to minimize transaction costs [21]. This is because managers hold inside information about the company's performance and value. Indebtedness generates a positive signal to the market, suggesting that the company is growing, while the issuance of capital generates a negative signal, suggesting that the shares are overvalued.

1-3- Determinants of the Capital Structure

Profitability

Frank and Goyal (2009) [3] suggest that the most profitable companies face lower financial distress costs and take better advantage of the tax benefits of interest. According to TOT, a positive relationship between profitability and indebtedness is expected [5, 7]. On the other hand, Bessler et al. (2011) [19] argue that more profitable companies generate more internal funds. According to the POT, a negative relationship between profitability and indebtedness is expected [3].

Growth Opportunities

Jensen (1999) [7] argues that firms with more growth opportunities do not need so much indebtedness to monitor deviant managerial activities. But sub / overinvestment problems aggravate agency problems [6, 19]. According to TOT, a negative relationship between growth opportunities and indebtedness is expected [20].

* These represent the costs resulting from the indebtedness, more specifically, agency, bankruptcy and transaction costs, which increase when the capacity to obtain more credit is compromised.

According to POT there are two possible effects. On the one hand, Aggarwal and Kyaw (2010) [21] and Bessler et al. (2011) [19] argue that companies with more investment accumulate more debt, suggesting that growth opportunities are positively related to indebtedness. On the contrary, Alipour et al. (2015) [5] argue that the fastest growing companies use sources of financing less subject to information asymmetry, using more internal funds.

Size

Titan and Wessels (1988) [20] and Alipour et al. (2015) [5] point out that larger firms tend to diversify more, stabilize cash flows and less probability of bankruptcy, thus being more leveraged. According to TOT, a positive relationship between size and indebtedness is expected. Bessler et al. (2011) [19] suggest that large companies are more followed by the market, there being more information dissemination and, thus, fewer problems of asymmetry. According to the POT, a negative relationship between size and indebtedness is expected [3].

Cash-Flow

Bessler et al. (2011) [19] and Alipour et al. (2015) [5] argue that firms with volatile cash flows have less debt due to financial distress costs. Myers (1984) [9] argues that if cash flows are sufficient for low-risk investment, it will not be useful to resort to indebtedness. According to TOT and POT, a negative relationship between cash flows and indebtedness is expected.

Tangibility

Bessler et al. (2011) [19] argue that firms with a higher proportion of tangible fixed assets are less likely to default, facing lower financial distress costs. This is due to the greater ease of evaluation of these assets by the outsiders [3]. According to TOT, a positive relationship between tangibility and indebtedness is expected. Frank and Goyal (2009) [3] and Bessler et al. (2011) [19] argue that the lower information asymmetry associated with tangible assets makes stock issuance less onerous. According to POT, a negative relationship between tangibility and indebtedness is expected.

Non-Debt Tax Benefits

DeAngelo and Masulis (1980) [22] and Titman and Wessels (1988) [20] suggest that companies with depreciation tax deductions resort less to indebtedness because they are substitutes for interest tax benefits. According to the TOT theory, a negative relationship between these benefits (as calculated by Fama and French (2002) [23] and by Serrasqueiro et al. (2012) [24]) and indebtedness is expected.

2- Empirical Study

2-1- Sample and Data

The accounting information of the Portuguese companies was collected in the SABI database. A total of 55 companies were selected, evenly divided by the criteria, crossing the legal form (public company limited by shares [25] and limited liability company) with the classification of the main economic activities (CAE), and excluding entities that did not present the necessary data, which reported losses (these companies have a better profile to make their own financing decisions), and that did not survive in the analysis period - between 2014 and 2016.

2-2- Variables and Hypotheses of the Study

Indebtedness (IND) represents the dependent variable in the model, while the independent variables are represented by tangibility (TANG), profitability (PROF), size (SIZE), growth opportunities (GROWTH), nondebt tax benefits (NDTB), cash flow (CFLOW), legal form (LF) and sector of activity (SECTOR).

Table 1. Dependent variable and independent variables in the model.

Variables	Formulation	Empirical Studies of Authors
Indebtedness	$\frac{Total\ liabilities}{Total\ liabilities + Equity}$	- Alipour et al. (2015) [5] - Coelho (2014) [36]
Tangibility	$\frac{Net\ Tangible\ Fixed\ Assets}{Total\ Assets}$	- Alipour et al. (2015) [5] - Coelho (2014) [36] - Serrasqueiro and Maccedil (2010) [33] - Serrasqueiro et al. (2012) [24]

Profitability	$\frac{Net\ Income}{Equity}$	- Coelho (2014) [36]
Size	$Ln(Turnover)$	- Coelho (2014) [36] - Serrasqueiro and Maccedil (2010) [33] - Titman and Wessels (1988) [20]
Growth Opportunities	$\frac{Total\ Assets_N - Total\ Assets_{N-1}}{Total\ Assets_{N-1}}$	- Alipour et al. (2015) [5] - Serrasqueiro et al. (2012) [24]
Non-Debt Tax Benefits	$\frac{Depreciation\ /\ Amortization}{Total\ Assets}$	- Fama and French (2002) [23] - Serrasqueiro and Maccedil (2010) [33] - Serrasqueiro et al. (2012) [24] - Titman and Wessels (1988) [20]
Cash Flow	$\frac{Net\ Income + Depreciation}{Total\ Assets}$	- Serrasqueiro and Maccedil (2010) [33]

The definition of the hypotheses to be tested in the study is based on the identification of the determinants that influence the capital structure. Thus, the expected relationship between the dependent variable and the independent variables was considered in the light of the TOT and the POT (Table 2). The hypotheses were also defined according to the majority of the international empirical evidence (Table 3).

Table 2. Expected relationship by TOT and POT between indebtedness and determinants of capital structure.

Leverage Factor	TO Theory	PO Theory
Tangibility	+	-
Profitability	+	-
Size	+	-
Growth Opportunities	-	+ / -
Non-Debt Tax Benefits	-	
Cash Flow		-

Table 3. Empirical evidence of the relationship between indebtedness and determinants of capital structure.

Explanatory Variables	Relation to Indebtedness	Empirical Studies
Tangibility	+	- Coelho (2014) [36] - Frank and Goyal (2009) [3]
Profitability	-	- Alipour et al. (2015) [5] - Coelho (2014) [36] - Frank and Goyal (2009) [3] - Gomes (2013) [34] - Serrasqueiro and Maccedil (2010) [33] - Titman and Wessels (1988) [20]
Size	+	- Coelho (2014) [36] - Frank and Goyal (2009) [3] - Serrasqueiro and Maccedil (2010) [33]
Growth Opportunities	-	- Alipour et al. (2015) [5] - Fama and French (2002) [23] - Frank and Goyal (2009) [3]
Non-Debt Tax Benefits	-	- Fama and French (2002) [23] - Gomes (2013) [34] - Serrasqueiro and Maccedil (2010) [33]
Cash Flow	-	- Serrasqueiro and Maccedil (2010) [33]
Activity Sector	+/-	- Titman and Wessels (1988) [20]

Based on the above, the hypotheses of study are defined:

H_1: Tangibility is positively related to indebtedness

H_2: Profitability is negatively related to indebtedness

H_3: Size is positively related to indebtedness

H_4: Growth opportunities are negatively related to indebtedness

H_5: Non-debt tax benefits are negatively related to indebtedness

H_6: Cash flow is negatively related to indebtedness

H_7: The sector of activity exerts influence on the indebtedness

H_8: Legal form exerts influence on the indebtedness

3- Methodology

The methodology underlying the identification of the determinants of financing decisions, and thus the capital structure of Portuguese companies, is characterized by a quantitative study using the Ordinary Least Squares (OLS), Least Squares Dummy Variables (LSDV), and Random Effects regression models (Figure 1). The analysis of panel data considers the effects of the individuals (companies in the sample) and the time (period of 3 years), and statistical tests are applied for model selection. Data processing uses R and R-Studio software (v3.3.1.) with Croissant and Millo [26] package *plm*.

OLS model

The OLS linear regression model [27] can be stated as:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \varepsilon_{it} \quad (1)$$

Y_{it}: Explained variable of individual *i* at time *t*;

$\beta_0, \beta_1, \beta_2, \ldots, \beta_k$: Regression coefficients;

$X_{1it}, X_{2it}, \ldots, X_{kit}$: Explanatory covariates of individual *i* at time *t*;

ε_{it}: Error term or residuals.

Model LSDV within

The panel data model with fixed effects for individuals [27] can be represented by:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \alpha_i + \varepsilon_{it} \quad (2)$$

and the panel data model with fixed effects for time:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \theta_t + \varepsilon_{it} \quad (3)$$

As well as the panel data model with fixed effects for individuals and for time:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \alpha_i + \theta_t + \varepsilon_{it} \quad (4)$$

α_i: Constants representing the specific effects of the individuals.

θ_t : Constants representing the specific effect of each moment in time.

Random effects model

The panel data model with random effects for individuals [27] may be represented by:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + b_i + \varepsilon_{it} \quad (5)$$

b_i: Random variable with normal distribution and zero mean, independent of ε_{it}.

Panel data model

The selection of the most suitable model for the study uses statistical tests under certain hypotheses. The F test compares OLS pooled and LSDV within models, i.e., between a linear model with the entire sample and an equation model for each individual [27]. The Breusch-Pagan Lagrange Multiplier test (LMBP) [28] also compares panel data models (with individual effects, or time effects or both effects) and OLS models. The Hausman Test [29] compares random effects models with fixed effects models [27].

The assumptions for using the panel data model are the independence of the residuals (tested by the Breusch-Godfrey Wooldridge test [30, 31]), the absence of heteroscedasticity (tested by the Breusch-Pagan test [28]), the normality of the residuals (tested with the Shapiro-Wilk test [32]) and the absence of multicollinearity problems (verified by the Variance Inflation Factor - VIF). The study on the capital structure of Portuguese companies uses the following random effects model for individuals:

$$IND_{it} = \beta_0 + \beta_1 TANG_{it} + \beta_2 PROF_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 NDTB_{it} + \beta_6 CFLOW_{it} + \beta_7 LF_{it} + \beta_8 SECTOR_{it} + b_i + \varepsilon_{it} \quad (6)$$

Being the dependent variable IND (indebtedness) and the independent variables TANG (tangibility), PROF (profitability), SIZE (dimension), GROWTH (growth opportunities), NDTB (non-debt tax benefits), CFLOW (cash flow), LF (legal form), SECTOR (sector of activity).

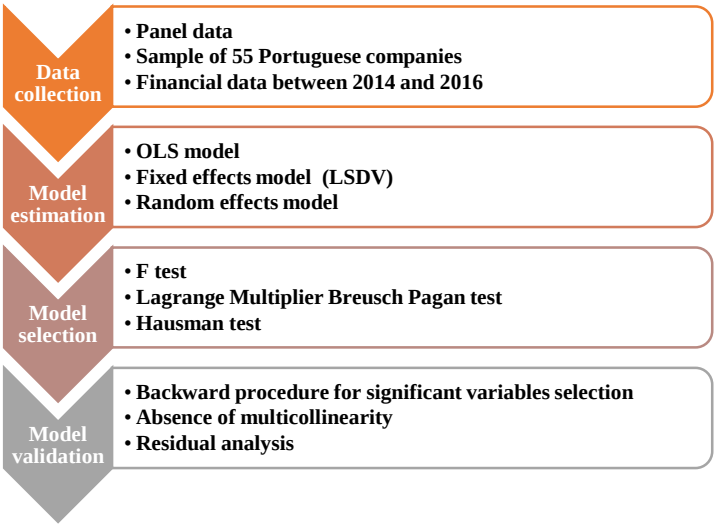

Figure 1. Methodology of the empirical study.

4- Results and Discussion

OLS model

An OLS model was fitted to the data, in order to understand the relations between the dependent variable Indebtedness and its covariates. The coefficients of this model are presented in Table 4.

Table 4. Results of the OLS linear regression model.

Variables	Coefficient	Pr(> |t|)
Intercept	-0.2023	0.3946
TANG	0.1075	0.2642
PROF	0.1167	8.138e-05***
SIZE	0.0423	0.0030**
GROWTH	0.1304	0.0315*
NDTB	0.2474	0.5374
CFLOW	-0.5283	0.0106*
LF (SQ)	0.0824	0.0575 #
SECTOR (10)	-0.0616	0.3409
SECTOR (35)	-0.0365	0.6293
SECTOR (42)	0.1170	0.1242
SECTOR (47)	-0.0485	0.5695
SECTOR (49)	0.0531	0.4723
SECTOR (55)	-0.1326	0.0449*

Significance levels: *** 0.1%, ** 1%, * 5%, # 10%.

Estimates of the parameters show that the variables TANG and NDTB are insignificantly related to indebtedness. Only CFLOW has a significant negative relationship with leverage. In the case of qualitative variables, LF (SQ) and SECTOR (55) were relevant to the capital structure. The multiple regression adjusted coefficient of determination R^2_{Adj} indicates that only 26.20% of the total variability of the dependent variable is explained by the independent variables.

4-1- Model Selection

The F test, the Lagrange Multiplier Breusch-Pagan (LMBP) test and the Hausman test were used to identify the most appropriate method of estimation of the coefficients.

Table 5. Tests to select the most adequate model.

	Pooled Model	Panel data model with fixed effects for individuals and for time	Panel data model with random effects for individuals
Panel data model with fixed effects for individuals	F Test p =< 2.2e-16*** LMBP Test p =< 2.2e-16***	F Test p = 0.1831 LMBP Test p = 0.2356	Hausman Test p = 0.5369
Panel data model with fixed effects for time	F Test p = 0.9463 LMBP Test p = 0.2356		
Panel data model with fixed effects for individuals and for time	F Test p =< 2.2e-16***		

Significance levels: *** 0.1%, ** 1%, * 5%, #10%.

In this analysis, tests on the random effects model for time and on the random effects model for time and individuals were not considered, since the respective models presented a singular matrix. Considering the results presented in Table 5, the appropriate model for this study will be the panel data model with random effects for individuals.

Estimates of the random effects model for individuals

Following the results of statistical tests for model selection, a panel data model with random effects for individuals was estimated (Table 6), including all explanatory variables suggested for the study.

Table 6. Estimates of panel data model with random effects for individuals, considering all explanatory variables.

Variables	Coefficient	Pr(> |t|)
Intercept	-0.1171	0.6873
TANG	0.2274	0.0029**
PROF	0.0122	0.2151
SIZE	0.0329	0.0589#
GROWTH	0.0430	0.0183*
NDTB	0.2116	0.1914
CFLOW	-0.4043	0.0017**
LF (SQ)	0.0825	0.2260
SECTOR (10)	-0.0254	0.8229
SECTOR (35)	0.0037	0.9747
SECTOR (42)	0.1958	0.1037
SECTOR (47)	0.0150	0.9100
SECTOR (49)	0.1046	0.3906
SECTOR (55)	-0.1164	0.3034

Significance levels: *** 0.1%, ** 1%, * 5%, #10%.

Differences in results are observed with respect to the OLS linear regression model. LF, SECTOR (55) and PROF lose statistical relevance, while TANG gains significance in explaining debt. The adjusted multiple coefficient of determination R^2_{Adj} decreased to 0.1523 from the OLS model (0.2620), although the tests selected the panel data model. This complete model includes all explanatory variables suggested for the study (cf. Table 1), some of which have no significant relationship with the explained variable.

Manipulation of the random effects model for individuals

To achieve the best specification from the selected model, the Backward procedure was used to remove the independent variables without explanatory power (PROF, NDTB, LF and SECTOR) and to improve the performance of the variables that remain. Through this manipulation, with rotation of independent variables, we found 30 new simulated models which were grouped in 5 groups, as a function of the relation of the independent variables with the dependent variable.

The results show that in the models where the variables TANG, SIZE, GROWTH, NDTB and SECTOR (42) were significant, they maintained the positive signal and the variable CFLOW maintained the negative signal. Given that the difference between these 30 models lies mainly in NDTB and SECTOR, the model presented in Table 7 was chosen, because in it most of the variables become more significant.

4-2- Results of the Adopted Model

Table 7. Estimates of the panel data model with random effects for individuals – Best model.

Variables	Coefficient	Pr(>|t|)
TANG	0.1560	0.0209*
PROF	0.0126	0.2027
SIZE	0.0317	<2.2e-16***
GROWTH	0.0329	0.0600 #
NDTB	0.2633	0.0958 #
CFLOW	-0.4264	0.0007***

Significance levels: *** 0.1%, ** 1%, * 5%, #10%.

The reduced expression of the adjusted coefficient of determination (R^2_{Adj} = 0.1372) in this model can be explained by the absence of the independent term, which is included in the OLS linear regression model with higher quality of fit (0.2020).

Variable PROF is the only non-significant variable in the debt explanation, invalidating H2. This evidence contrasts with the significant negative relationship found in [3, 5, 20, 33-36]. The sign and relevance of the TANG coefficient estimate are consistent with H_1 and TOT. This converges with [3, 36], but diverges in signal with [5] and in relevance with [34, 35].

The signal and relevance of the SIZE variable are consistent with H_3 and TOT. This converges with [3, 33, 36] but differs in signal with [5, 34] and in relevance with [35]. The signal and relevance of the GROWTH variable are inconsistent with H_4 but aligned with POT. This differs in sign with [3, 5, 35] and in relevance with [20, 34]. The sign and relevance of the NDTB variable are inconsistent with H_5 and TOT. This converges with [3] but diverges in signal with [33, 34] and in relevance with [20, 35].

The signal and the relevance of the CFLOW variable are consistent with H_6 and POT, converging with [33]. Given that the LF and SECTOR variables were excluded from the best model, the hypotheses H_7 and H_8 cannot be validated. Even so, non-resource firms in resource-dependent countries are found to be less indebted than their counterparts in other countries [37]. Table 8 shows the comparison between the expected relationship from the research hypotheses and the relationship observed in the study.

Table 8. Confrontation between expected relationship and observed relationship.

Hypotheses	Expected Relationship (hypotheses)	Observed Relationship (results)	Decision
H_1	+	+	Accepted
H_2	-	n.s	Invalidated
H_3	+	+	Accepted
H_4	-	+	Rejected
H_5	-	+	Rejected
H_6	-	-	Accepted

+ positive relationship, – negative relationship, n.s "non significant".

Model validation tests

To confirm the accuracy of the results obtained, it is necessary to check whether the random effects panel model for individuals (model in Table 7) meets the necessary statistical requirements.

Table 9. Tests of model assumptions.

Assumption	Test	Result	
Absence of multicollinearity	VIF	TANG	2.3353
		PROF	1.0181
		SIZE	1.9265
		GROWTH	1.4273
		NDTB	3.3559
		CFLOW	3.5064
Homoskedasticity	Breusch-Pagan	p = 0.0089**	
Independence of residuals	Breusch-Godfrey Wooldridge	p = 0.0013**	
Normality of residuals	Shapiro-Wilk	p = 0.0504 #	

Significance levels: *** 0.1%, ** 1%, * 5%, # 10%.

The results in Table 9 suggest absence of multicollinearity, except for the independent variables NDTB and CFLOW in which the VIF test has values just above 3, which is not critical. However, the results indicate the presence of heteroscedasticity and time dependence of the residuals, given the p-values lower than 5% in the Breusch-Pagan and Breusch-Godfrey Wooldridge tests, respectively. Despite the results of these tests, the lack of evidence of patterns in the representations of the residuals in Figure 2 suggests no problems with both assumptions tested (i.e., the residuals are well distributed around zero). Finally, the Shapiro-Wilk test suggests that the residuals are normally distributed, showing a p-value greater than 5%.

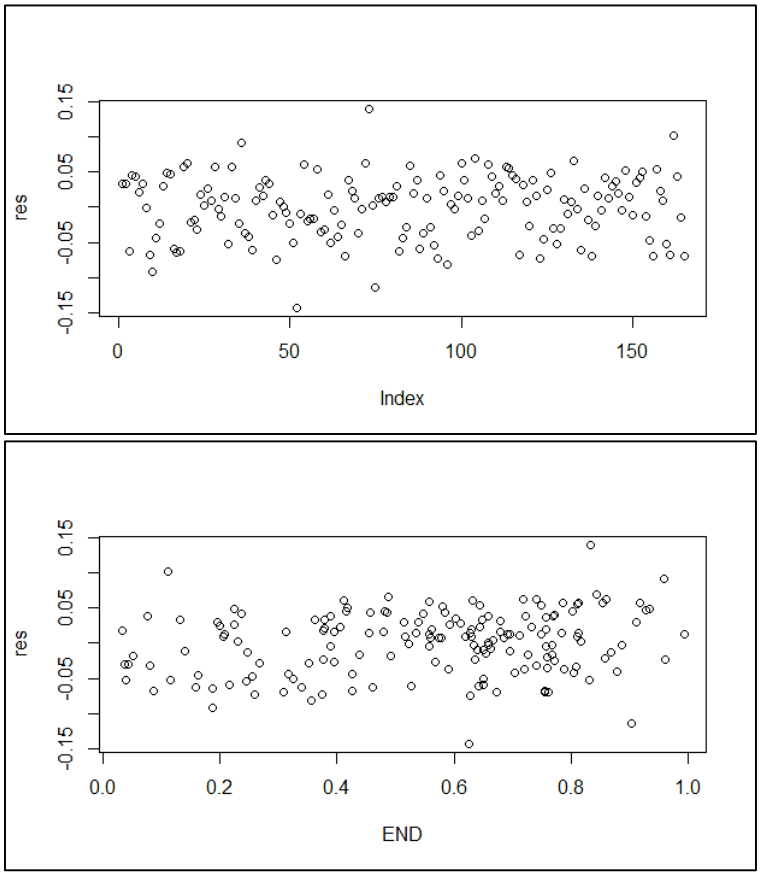

Figure 2. Diagrams of the residuals.

5- Conclusion

Using the panel data model with random effects for individuals, we investigated the determinants that underlie the decisions on capital structure of Portuguese companies, considering the assumptions of TOT and POT theories. In general terms, the models satisfy the usual properties to validate the results and their conclusions.

The results show that the variables RENT, LF and SECTOR are not relevant in the explanation of corporate indebtedness. On the other hand, the positive relationship with TANG suggests that the lower probability of default

and agency costs, arising from the guarantees of these assets, support TOT. In addition, the same relationship with SIZE suggests that the lower probability of bankruptcy, arising from the diversification and stability of cash flows, contributes to the increase of indebtedness, agency costs and transaction, supporting TOT. The findings suggest that firms adjust the level of indebtedness towards the target, although influenced by transaction and adjustment costs that keep them away from the optimum.

However, the positive relationship with the NDTB suggests the importance of taxes, contrary to TOT. The negative relationship with CFLOW – coupled with the positive relationships between SIZE and GROWTH – suggests the use of funding only when internal funds become insufficient, supporting the POT. The general results are consistent with H_1, H_3, H_6, and support that both theories partially explain the financing decisions of Portuguese companies, concluding that they are not mutually exclusive.

For future research it is recommended the inclusion of other sectors of activity (CAE) in the sample, which could provide relevance to this variable. In addition, other potentially explanatory factors of indebtedness, such as exports, the effective rate of income tax and the distribution of profits, are suggested. Since two assumptions of the model adopted in the study were not validated, for future investigation it is also recommended to use the Indebtedness as a lagged variable, using the GMM system estimation.

6- Funding

This work is financed by Portuguese national funds through FCT - Fundação para a Ciência e Tecnologia, under the project UIDB/05422/2020.

7- Conflict of Interest

The author declares that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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