

## **Trade Off and Pecking Order Capital Structure Theories in Tourism Sector in the Portuguese Central Region**

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*The present study aims to identify the predominant theory in financing decisions, and which are the determinants of the capital structure of small and medium enterprises (SMEs) of the tourism sector in the Central Region of Portugal. The statistical method applied was the econometric model of linear regression, using a sample of 606 SMEs in the tourism sector in the Central Region, for a period of analysis between 2011 and 2018. The focus on the tourism sector is due to its importance in the Portuguese economy and to the existence of few studies, particularly in the Central Region. In the analysis of the determinants of capital structure decisions we used as explanatory variables profitability, asset tangibility, size, total liquidity, other non-debt tax shields, risk and age of SMEs. The results obtained suggest that the capital structure decisions follow more closely the assumptions of the Pecking Order theory but may also follow the assumptions of the Trade-Off theory. Therefore, this paper enhances that Trade-Off and Pecking Order Theories are not mutually exclusive in explaining the capital structure decisions of SMEs. We may conclude that SMEs firstly finance themselves with retained earnings, then use external financing and finally resort to capital increases.*

**Keywords:** *determinants of capital structure, SMEs, tourism sector, pecking order theory, trade-off theory*

### **Introduction**

Small and Medium Enterprises (SMEs) have an extremely important role for the Portuguese economy as generators of opportunities and jobs, promoting the development of the region where they are located. According to data from INE (National Statistics Institute), regarding Portuguese companies in 2019, the Portuguese SMEs represent about 99.90% of the business sector. Therefore, the fact that this type of companies represents the structural basis of the Portuguese economic environment leads us to highlight the importance and relevance of studies whose sample is composed of SMEs.

The sample under study is composed of SMEs within the tourism sector of the Central Region of Portugal, companies within the manufacturing industries

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with CAE 55 - Accommodation, according to the Portuguese Classification of Economic Activities (CAE), CAE-Rev.3.

Marujo (2008) mentions that tourism is one of the most important phenomena, from the political, economic, environmental, and socio-cultural point of view. It is no longer seen merely as a synonym for leisure and has now assumed a role as a social agent in the societies in which it has been developed.

The choice of the tourism sector is due to its importance in the Portuguese economy (Pacheco and Tavares 2017). Several authors have been studying this sector (for example: Abrantes 2013, Pacheco and Tavares 2017, Peixoto 2017, Herdeiro 2019). As there are not many studies focused on the Central Region, we focused our analysis on this region.

According to the CCDRC<sup>1</sup>, the Central Region of Portugal, which incorporates 100 municipalities, is a territorial unit for statistical purposes (NUTS II<sup>2</sup>) bounded to the north by the North Region, to the east by Spain, to the south by the Alentejo and the Lisbon Regions, and to the west by the Atlantic Ocean.

SMEs face more limited internal financial resources, which leads them to seek external financing. However, the constraints associated with this form of financing, namely the use of bank credit, are very relevant for this type of company. These constraints range from difficulties in accessing bank loans at low interest rates, the lack of government support to create conditions that facilitate or ease access to such loans, the disclosure of accounting information, among others (Correa et al. 2013, Pandula 2015, Calei 2019).

The studies of Modigliani and Miller (1958, 1963) generated an extensive discussion on the capital structure of companies, thus supporting the development of new theories, namely the Trade-Off theory and the Pecking Order theory. These theories seek to explain the decisions made by corporate managers/owners when choosing their sources of funding. According to Myers (1984) the Trade-Off and Pecking Order theories compete with each other in explaining the capital structure of companies.

Some studies conclude that the Trade-Off and Pecking Order theories have great applicability in capital structure decisions of SMEs in general. The fundamental objective of this research is to analyse the capital structure decisions of SMEs in the tourism sector in the Centre Region of Portugal, according to the principles of the Trade-Off and Pecking Order theories.

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<sup>1</sup>Comissão de Coordenação e Desenvolvimento Regional do Centro (Regional Co-ordination and Development Commission of the Centre)

<sup>2</sup>Nomenclatura das Unidades Territoriais para Fins Estatísticos (Nomenclature of Territorial Units for Statistics Purposes): hierarchical system of territorial division into regions. This nomenclature was created by Eurostat at the beginning of the seventies, in order to harmonise statistics data from various countries in terms of collection, compilation and dissemination of regional statistics. The nomenclature is subdivided into 3 levels (NUTS I, NUTS II, NUTS III), defined according to population, administrative and geographical criteria.

## Literature Review

### *Theories of the Financial Structure of SMEs*

#### Trade-Off Theory

Trade-Off theory holds that firms attempt to achieve an optimal capital structure that maximises firm value by balancing the tax benefits and bankruptcy costs associated with debt (Myers 1984).

Kraus and Lintzenberger (1973) point out that insolvency costs can be quite significant for companies, as they contribute to a reduction in the value of the company, and an increase in the debt level of companies leads to an increase in insolvency costs. The incorporation of these costs in the literature, in order to explain the reasons why companies were not fully financed with debt, gave rise to the Trade-Off Theory, developed by some authors, such as Myers (1977), DeAngelo and Masulis (1980) and Myers (1984), among others.

Several authors use the designation Trade-Off theory to describe a set of theories concerning the existence of an optimal capital structure that maximises the value of the company, based on the trade-off between the costs and benefits of debt.

Serrasqueiro and Caetano (2014) states that the trade-off model refers to the choice by firms of an optimal level of debt to balance the tax benefits with the bankruptcy costs associated with debt. This theory recognises that there are tax benefits and that debt can bring benefits to a firm as long as these benefits outweigh the costs associated with debt that may arise. DeAngelo and Masulis (1980) considered that all companies could have a given debt structure based on the trade-off between insolvency costs and the tax advantage from the deductibility of interest on debt, regardless the size of the bankruptcy costs.

Novo and Vieira (2010) point out the benefits to the firm of the tax advantage associated with debt, but also the costs associated with corporate bankruptcy, with the probability of bankruptcy increasing with the firm's debt ratio. Novo (2009) states that "the trade-off theory supports the idea that, if on the one hand, debts bring advantages to the company through tax benefits, on the other hand, it also brings costs related to the company's bankruptcy (Financial bankruptcy occurs when a company is unable to meet its commitments, or when it does so after the established deadline). The probability of incurring bankruptcy is higher the higher the degree of debts of the company."<sup>3</sup>

Therefore, this theory is developed on two bases. On the one hand, it identifies debt as a factor that generates benefits for the company in terms of tax savings, if the company is able to generate results that allow it to benefit from these tax advantages. On the other hand, it recognises that, despite the benefits of debt in terms of tax savings, the risk of financial insolvency increases beyond a certain level of debt and, consequently, the cost of insolvency has a negative impact on the value of the company.

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<sup>3</sup>Novo 2009, p. 30, lines 9-12 and lines 29-30.

According to Novo (2009) bankruptcy costs can be divided into direct and indirect costs. So direct costs, such as accounting costs, legal costs and the payment of fees, the indirect costs, such as the opportunity costs resulting from the company's inability to maintain its relationship with suppliers and/or customers (Haugen and Senbet 1978).

The Myers (1984) model advocates that the more debt a company has, the greater its tax advantages and financial difficulties, so it needs to find a point of debt that maximises its value. The level of debt is limited by the costs of possible financial difficulty, the market value of a company grows as a function of the tax benefits generated by debt until the point at which doubts begin to be raised about the financial health of the company and the costs of bankruptcy begin to be high.

According to Matias et al. (2015), cited by Calei (2019), the objective of the Trade-Off theory is to search for an optimal ratio of debt, where the tax benefits equal the bankruptcy costs. According to Pereira et al. (2015), if the company's assets and investment plans remain constant, the limit for the use of borrowed capital occurs when the costs generated by debts, which cause financial difficulties, become greater than the benefits generated.

### Pecking Order Theory

The expression Pecking Order is, in Myers' words, a recent concept. For the advocates of the Pecking Order theory, there is a hierarchy of financing sources chosen by a company. Financing should firstly come from internally generated resources (self-financing) and if these are insufficient, the company should resort to debt. Only in the last instance should it resort to issuing new shares to obtain capital. This theory is based on the assumption that there is information asymmetry between managers and investors.

The Pecking Order theory is characterised by the correct choice of financing sources, used by the company in order to minimise the costs caused by information asymmetry<sup>4</sup>. Myers (1984) and Myers and Majluf (1984) contributed to the development of this theory by introducing the effect of asymmetric information between managers and investors in the analysis of corporate financing decisions.

In the presence of information asymmetry, companies follow a hierarchy in the selection of financing sources, preferring to finance themselves initially with internally generated funds (retained earnings), retaining surplus funds. These are considered to be easily accessible by the company and not subject to external interferences, presenting a lower cost when compared to funds obtained externally. However, when the companies have insufficient or no self-financing, the managers prefer external financing (debt), leaving the issue of shares to external investors as a last option (Myers and Majluf 1984). Myers and Majluf (1984) suggest that if the investor does not have sufficient information about the value of the company, especially when compared to the managers, the company runs the risk of being undervalued by the market.

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<sup>4</sup>Information asymmetry - The information held by managers is superior to the information known by external investors, in relation to the situation of an entity.

According to Novo (2009, p. 41) “the privileged sources of financing are self-financing and bank credit.” The difficulty in accessing the capital market, exacerbated for SMEs, makes the issue of new shares impracticable. Companies only issue equity when they see the possibility of resorting to debt exhausted. Nevertheless, the higher the profitability of companies and, consequently, the greater their capacity to finance themselves with internal funds, the lower their level of debt will be.

As Harris and Raviv (1991) point out, one way to minimize the fall in share prices would be for the company to finance the new investment through less risky sources, such as its own resources or issuing debt securities, and only, after the investment is completed, to settle this debt through a share issue.

For Chirinko and Singha (2000) and Frank and Goyal (2003), the Pecking Order theory is subdivided into two forms of financing, strong financing and weak financing. Strong financing occurs when a firm chooses only two sources of financing, namely the use of internal resources and the issuance of debt, and does not resort to the issuance of shares for its financing. Weak financing occurs when, for some reason, there is no information asymmetry at the moment, and the company admits a certain level of share issuance for its financing.

However, Campos and Nakamura (2015) state that in the Pecking Order theory there is no mention to an optimal debt ratio, but the debt would be a consequence between the conditions of information asymmetry with the market and the emergence of good projects. In this context, managers should be vigilant to the costs of funding sources without worrying about reaching a certain target capital structure.

## **Investigation Hypotheses**

### *Profitability*

According to the literature review, the main theories that support the determinants of corporate capital structure are Trade-Off and Pecking Order, because, on the one hand, they are the two most significant theories in the field of capital structure field and, on the other hand, SMEs are mostly privately held companies. Therefore, the hypotheses will be formulated according to the principles underlying the Trade-Off and Pecking Order theories, in order to homogenise the exposition of the hypotheses to be tested. The determinants of capital structure had as references the studies of Bastos and Nakamura (2009), Pereira et al. (2015), Peixoto (2017), Pacheco and Tavares (2017) among others. According to the Trade-Off Theory, the most profitable companies should use more debt, as they benefit from the tax deduction of interest (Modigliani and Miller 1963), thus suggesting a positive relationship between profitability and debt. Companies with greater capacity to create and maintain results have greater negotiation power, obtaining the most attractive interest rates when the company resorts to external financing (Ross 1977, Harris and Raviv 1991). The various studies based on this theory identify a positive relationship between profitability

and the level of corporate debt (for example, Sogorb-Mira 2005, Ramalho and Silva 2006). Firms with higher profitability tend to have a higher level of debt, since bankruptcy costs decrease as profitability increases. In addition, the more profitable a firm is, the more it will benefit from the tax advantage obtained by deducting interest on loans. On the other hand, the Pecking Order theory assumes that when companies need to finance their investments, they have a hierarchical preference in the choice of financing sources. Cumulative earnings are first used, then third-party resources via debt and, finally, issuing new shares. Thus, the more profitable companies are, the more they are able to finance themselves and the less they need to increase their debt (Myers 1984, Myers and Majluf 1984). According to Bastos and Nakamura (2009), Serrasqueiro and Nunes (2011, 2014) and Novo and Vieira (2010), companies prefer to use internal resources first and only afterwards they seek for external resources, corroborating the Pecking Order theory. Therefore, it is expected that the more profitable SMEs are more likely to retain profits and, consequently, use them to finance themselves. Recently, Sardo and Serrasqueiro (2022) the positive impact of the probability of financial distress on SME working capital suggests that SMEs exposed to a higher probability of bankruptcy invest more in working capital to avoid the risk of default and financing imbalance.

Considering the various points of view, we can formulate the following hypotheses:

H1.1: There is a positive relationship between profitability and debt in SMEs.

H1.2: There is a negative relationship between profitability and debt in SMEs.

### *Tangibility of Assets*

The asset structure represents the set of tangible and intangible assets held by a company. Tangible company assets such as land, machinery and buildings can be used as a guarantee in the event of the company's bankruptcy, protecting the interests of creditors.

The Trade-Off theory is based on a positive relationship between tangibility of assets and debt, the higher the value of tangible assets, the higher the financing/guarantee in case of insolvency (Calei 2019). The existence of collateral reduces agency costs and information asymmetry problems as mentioned by Jensen and Meckling (1976) and Ross et al. (2011). Serrasqueiro and Nunes (2014), established a positive relationship between asset tangibility and debt, since a company with a high level of collateral may find it easier to increase the recourse to debt as creditors offer more favourable credit conditions.

In line with the Trade-Off theory, also in the Pecking Order theory one expects to find a positive relationship between the amount of tangible fixed assets of the firm and its level of debt. The most common empirical results regarding the relationship between asset tangibility and debt point to a positive relationship (Serrasqueiro and Nunes 2014, Peixoto 2017, Calei 2019).

Thus, we predict the following hypothesis:

H2: There is a positive relationship between tangibility of assets and debt in SMEs.

### *Firm Size*

The size of the company is a determining factor in the capital structure. The larger the size of a company, the greater its capacity to finance itself, so larger companies have easier access to external financing and have fewer asymmetry problems and a lower probability of default (Herdeiro 2019). Matias and Serrasqueiro (2017) mention that for McConnell and Pettit (1984) the size of the company is especially relevant to explain the capital structure of SMEs. The same idea is stated by Novo and Vieira (2010). Following the Trade-Off theory strand, larger firms tend to be more diversified and are less likely to become insolvent. In addition, due to lower information asymmetry, larger firms have easier access to capital markets and pay lower interest rates, having a greater incentive to increase their borrowed capital (Fama and French 2007). In the context of the Pecking Order theory, a positive relationship between size and debt is also expected. Empirical studies by Serrasqueiro and Nunes (2014) point out a positive relationship between size and debt, highlighting that larger companies reduce the possibility of bankruptcy given the greater ability of the company to have a great diversification of activities, products or services. Consequently, lower bankruptcy costs allow large companies to have higher levels of debt. Calei (2019) concludes that larger firms find it easier to mitigate their information asymmetry problems, which leads to easier access to debt.

The two main theories argue that there is a positive association between size and debt. Therefore, the third hypothesis formulated was as follows:

H3: There is a positive relationship between size and debt in SMEs.

### *Total Liquidity*

Total liquidity enables the measurement of the company's ability to meet its short term commitments, verifying which are the preferred sources of financing. According to Pereira et al. (2015), total liquidity is the ability recognized to an asset to be converted into monetary means, cash or cash equivalents, to meet its short-term or current commitments. According to the Pecking Order theory a negative relationship is expected between liquidity and the level of debt of a company, since companies with a high level of liquidity have plenty of internal funds, and, therefore, they do not need to resort to debt as much to finance their investments. The relationship between total liquidity and debt plays a more relevant role in SMEs, as they do not press their clients with the same intensity that large companies do, so payments are often financed by trade credit, which leads to an increase in current liabilities. Hence, more indebted companies have a lower level of treasury (Pastor and Gama 2013). The papers by Pereira et al. (2015), Bastos and Nakamura (2009), Pastor and Gama (2013) and Pacheco and Tavares (2017) reveal a negative relationship between liquidity and debt. Several studies mention that companies with low levels of liquidity have a preference for short-term debt. In relative terms, Pacheco and Tavares (2017) refer that the analysed SMEs have more short-term debt to face their obligations, since they

have high liquidity problems. For SMEs that suffer from the problem of meeting their charges, there are two ways to mitigate this issue: delay, to some extent, payments to creditors or increase short-term bank loans.

Thus, it is expected a negative relationship between liquidity and debt.

H4: There is a negative relationship between liquidity and debt in SMEs.

#### *Other Non-debt Tax Shields*

The Trade-Off theory predicts a negative relationship between other non-debt tax shields and debt. DeAngelo and Masulis (1980), show that the importance of a firm depends not only on economic factors but also on the capital structure adopted. In addition, they state that other tax benefits, such as tax deductions allowed by depreciation and investment tax credits, could complement the tax saving function provided by debt. However, a firm with a high level of other non-debt tax shields has a lower degree of debt than a firm with few other non-debt tax shields. As firms increase debt, so does the probability that the output reaches levels for which the tax protection generated by the available tax benefits cannot be used (Gama 2000). Pacheco and Tavares (2017) mention in their study that as for the variable other tax benefits besides debt it was not considered relevant, nor was it considered in short-term debt, long-term debt and, consequently, in total debt. Thus, it does not confirm the trade-off theory that argues for a negative relationship between other non-debt tax shields and short-term debt. The study by Novo and Vieira (2010) establishes a negative relationship with short-term debt and a positive effect on long-term debt. There are several studies that found no statistically significant relationship between other non-debt tax shields: Serrasqueiro and Nunes (2011), Serrasqueiro and Nunes (2014) and Calei (2019).

Thus, a negative relationship is expected between tax benefits other than debt and the level of debt of firms, materialised in the following hypothesis:

H5: There is a negative relationship between other non-debt tax shields and debt in SMEs.

#### *Risk*

SMEs are companies that usually operate in less concentrated markets and therefore face high competition, higher risk and a higher probability of bankruptcy, so these companies tend to slow down their debt levels (Abrantes 2013). The Trade-Off theory predicts a negative relationship between risk and debt level (Bastos and Nakamura 2009). The higher the risk, the higher the likelihood that the companies' cash flows will be insufficient to honour the commitments with creditors, which in turn, will reduce the possibility of being able to get indebted (Pereira et al. 2015). The Pecking Order theory also predicts a negative relationship between risk and the ratio debt: the higher the risk, the more likely the firm will become insolvent. Thus, risk reduces the financing capacity of firms and increases their costs (Myers 1984). Therefore, the Pecking Order theory predicts that firms with high business risk make efforts to accumulate capital over the years to avoid



lack of funds in the future. For Bastos and Nakamura (2009), debt is negatively related to risk. Several empirical studies present divergent results on the relationship between risk and debt. It is evident the difficulty in defining the parameters capable of measuring such attribute, since the costs of financial failure are difficult to estimate. In general, the risk of a company is constituted by the level of insecurity regarding its future (Novo and Vieira 2010).

Thus, we establish the following hypothesis:

H6: There is a negative relationship between risk and debt in SMEs.

### *Firm Age*

Age is related to the life cycle of companies, being expected greater financing needs in the early years. Serrasqueiro and Caetano (2014) state that age can be an important determinant in capital structure decisions, unlike more mature companies that are already at a later stage of their life cycle, young companies, at the beginning of their lives, tend to resort more to borrowed capital. The older the firm, the more likely it is to generate good impression with its creditors and mitigate agency problems and costs, which allows easier access to debt (Serrasqueiro and Caetano 2014). Thus, it is expected a positive relationship between age and the level of debt of the company, following the Trade-Off theory. According to the Pecking Order theory, older firms usually have greater capacity to generate internal funds and, therefore, greater self-financing capacity through retained earnings, so they tend to resort less to debt. Thus, in line with the Pecking Order theory approach, but contrary to the Trade-Off theory, a negative relationship is expected between the age of the firm and its level of debt. Empirically Abor and Biekpe (2009) concluded that age is a key factor in access to funding, as firms that have been in business for longer have more guarantees to offer to banks in case they are unable to honour their commitments. Gama (2000), Serrasqueiro and Caetano (2011) and Calei (2019) found a negative relationship between age and debt. According to Novo and Vieira (2010), older firms generate enough internal resources to not be as dependent on debt as younger firms.

Thus, the following research hypotheses are proposed.

H7.1: There is a negative relationship between age and debt in SMEs.

H7.2: There is a positive relationship between age and debt in SMEs.

## **Research Design**

### *Sample*

The SABI<sup>5</sup> database was used to collect the empirical data. The selection of the companies was made based on recommendation n. °2003/361/EC<sup>6</sup>, belonging

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<sup>5</sup>SABI - Sistema de Análise de Balanços Ibéricos (Iberian Balance Sheet Analysis System). It is an advanced data search and processing tool, which allows to easily analyse the general information

to CAE 55 (Accommodation). Initially it was possible to collect information for a set of 921 SMEs for the Central Region for a period of 8 years, between 2011 and 2018.

Subsequently, the following criteria were applied to refine the sample in accordance with the objectives of the study: only companies that were active and for which the information necessary to operationalise the variables was available were selected.

Finally, we checked which companies are technically bankrupt in accordance with article 35 of the Commercial Companies Code<sup>7</sup>, since it is not the aim of this study to analyse the capital structure of companies that are technically bankrupt. Thus, after considering the selected criteria, it was possible to obtain a sample with 2445 observations related to companies with CAE 55 in the Central Region of Portugal for a period of 8 years.

After computing the various ratios and the necessary and mentioned transformations, the data were exported to the statistical software IBM SPSS Statistics, version 25, in order to perform the statistical treatment and to test the hypotheses previously formulated.

### *Variables*

In this study, the dependent variable is measured by total debt (Table 1), being calculated by the quotient between total liabilities and total assets. This is the variable that we intend to explain within the capital structure of SMEs of the tourism sector in the Centre Region, considering the work of Novo and Vieira ovo (2010), Degryse et al. (2012) and Pacheco and Tavares (2017).

**Table 1.** *Dependent Variable*

<b>Abbreviation</b>	<b>Variable</b>	<b>Description</b>
ENDT	Total Debt	$\frac{\text{Total Liabilities}}{\text{Total Assets}}$

The independent variables used had as references the studies of Bastos and Nakamura (2009), Serrasqueiro and Caetano (2014), Pereira et al. (2015), Pacheco and Tavares (2017) among others, and are listed in Table 2.

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and the annual accounts of selected companies and to personalise the presentation of results. It includes sophisticated and unique statistical processing options. This system is in charge of Bureau Van Dijk.

<sup>6</sup>According to this recommendation, a business unit is considered an SMEs if it meets two of the following criteria: fewer than 250 employees, less than 43 million euros in assets or less than 50 million euros in turnover.

<sup>7</sup>A company is technically bankrupt when its equity is equal to or less than half of its share capital.

**Table 2.** *Independent Variables*

Abbreviation	Variable	Description
REND	Profitability	$\frac{EBIT}{Total\ Assets}$
TANG	Assets tangibility	$\frac{non\ current\ assets + inventories}{Total\ Assets}$
DIM	Turnover size	$\ln(\text{turnover})$
LG	Total Liquidity	$\frac{Current\ Assets}{Current\ Liabilities}$
OBF	Other non-debt tax shields	$\frac{Depreciation\ for\ the\ year\ EBIT}{Total\ Assets}$
RISC	Risk	$\frac{Non\ Current\ Liabilities}{Total\ Liabilities}$
ID	Age	<i>Log of the number of years in business</i>

*Regression Model*

According to the research objectives and similar to other studies, such as Bradley et al. (1984), Gama (2000), Novo (2009) and Rodrigues (2012), the multiple linear regression model was used to test the relationship between the level of debt and the determinants of SMEs capital structure. Marôco (2018) states that regression analysis defines a set of statistical techniques used to shape relationships between variables and predict the value of one or more dependent variables from a set of independent variables.

In the present study we intend to model the linear relation between the level of debt of a company (dependent variable) and the variables profitability, asset tangibility, turnover size, total liquidity, other non-debt tax shields, age and risk (independent variables), as follows:

$$ENDTi = \beta_0 + \beta_1 RENDi + \beta_2 TANGi + \beta_3 DIMi + \beta_4 LGi + \beta_5 OBFi + \beta_6 IDi + \beta_7 RISCi + \varepsilon_i$$

The linear regression model will be estimated by the ordinary least squares (OLS) method. For the proposed model to be valid it is necessary to test and validate the following assumptions: the normality with zero mean, the independence, the homoscedasticity of the residuals and the multicollinearity of the independent variables (Rodrigues 2012, Cardoso 2013, Marôco 2018).

## Results

### *Descriptive Statistics and Correlation Matrix*

For the period under analysis, 2011-2018, the mean and the standard deviation of the variables are presented in Table 3 and Table 4 shows the Pearson's correlation matrix between the variables.

**Table 3.** Mean and Standard Deviation of Variables

Variable	N	Mean	Standard Deviation
ENDT	2863	0,5207	0,2672
REND	2863	0.0352	0.1358
TANG	2863	0,7194	0,2830
DIM	2524	1,9872	0,7493
LG	2731	6.9316	25.1143
OBF	2863	0,0443	0,0410
RISC	2863	1.8303	5.5930
ID	2863	14,3392	14,0500

The analysis of Table 3 shows that the average debt of SMEs in the tourism sector in the Central Region is 0.5207, which means that they finance externally about 52.07% of their total assets. The variables profitability, total liquidity and risk are highly volatile compared to the remaining. The remaining explanatory variables (tangibility of assets, size and age) have a standard deviation below their means, which allows us to conclude that the volatility of these variables is not considerable.

Analysing Table 4, most of the linear correlations between the explanatory variables and the dependent variable are statistically significant, with exception of DIM. The dependent variable presents a positive correlation with the explanatory variables TANG, OBF and RISC. On the other hand, it presents a negative correlation with the variables REND, LG and ID. It should also be noted that the absolute value of the correlation with the RISC variable is high and with the OBF variable is low (although statistically significant) compared to the other correlations observed.

**Table 4.** *Pearson's Correlations*

	ENDT	REND	TANG	DIM	LG	OBF	RISC	ID
ENDT	1							
REND	-0.150**	1						
TANG	0.243**	-0.357**	1					
DIM	-0.013	0.182**	0.009	1				
LG	-0.155**	-0.016	-0.163**	-0.107**	1			
OBF	0.078*	0.055**	0.037*	0.114**	-0.085**	1		
RISC	0.394**	-0.083**	0.131**	-0.083**	0.018	-0.055**	1	
ID	-0.182**	-0.027	0.065**	0.308**	0.007	0.079**	-0.075**	1

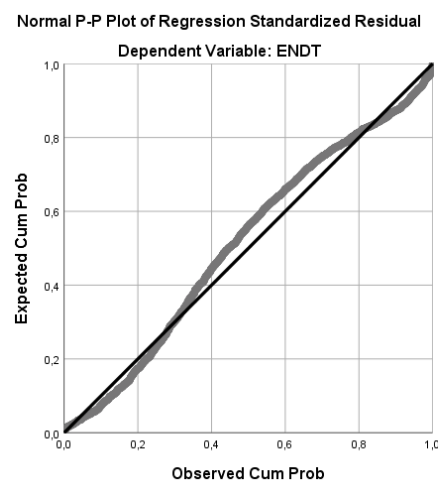
Note: \*\* significance at the 1% level; \* significance at the 5% level.

### *Validation of Regression Assumptions*

As mentioned, to ensure the validity of the model it is necessary to test its assumptions.

#### Normality and Mean of Residuals

The normality of the residuals can be graphically assessed through a probability plot, as shown in Figure 1. In this graph the points seem to be distributed close to the diagonal line, which means that the distribution of the estimated residuals seems to be approximately normal.

**Figure 1.** *Normal Probability Plot*

Nevertheless, we can use measures of shape, asymmetry and kurtosis, to validate this assumption. Marôco (2018) considers that the values indicating a deviation from normality capable of compromising the reliability of the conclusions are still not consensual. However, he mentions that absolute values of

skewness and kurtosis below 3 and 7, respectively, indicate that the distribution of residuals is normal. The values obtained for the residuals are both below the indicated reference values, as shown in Table 5 and, consequently, they do not indicate problems regarding the assumption under analysis.

**Table 5.** *Skewness and Kurtosis*

<b>Residuals</b>	
Valid N	2445
Mean	0.000
Standard Deviation	0.224
<b>Skewness</b>	<b>-0.518</b>
<b>Kurtosis</b>	<b>0.807</b>

Table 5 also shows that the average of the residuals is zero.

#### Autocorrelation

To evaluate the assumption of residuals independence we resort to the Durbin-Watson test, whose null hypothesis states that the residuals are independent. The value of the Durbin Watson statistic obtained was  $d = 1.999$ , which is very close to 2, suggesting that the residuals are independent.

#### Homocedasticity

This assumption requires that the variance associated to the residuals is homogeneous. To test for homoscedasticity the Breusch-Pagan test was used, obtaining  $p < 0.01$ , indicating a possible presence of heteroscedasticity in the residuals of the model.

However, it was decided to maintain the initial model to characterize the sample data, aware that any inference made from it should be interpreted with great caution.

#### Multicollinearity

Multicollinearity, which refers to the existence of a linear relationship between independent variables, was diagnosed using the calculation of Pearson's correlations between the independent variables and the analysis of VIF (*Variation Inflation Factor*) values. The analysis of Table 4 shows that the values of the bivariate correlations are low, stressing however the correlations between TANG and REND and between ID and DIM, which are slightly above 0.3 (Aivazian et al. 2005). Nevertheless, these values are not very high, which leads us to conclude that the problem of endogeneity between the independent variables is not particularly relevant in this study.

The values of the VIF were also analysed as an indicator of multicollinearity. According to Marôco (2018), values greater than 5 indicate the presence of multicollinearity in the independent variables. Since the VIF values in Table 6 are all lower than 5, the conclusion that there is no significant correlation between independent variables is reinforced.

**Table 6.** *VIF Values*

<b>Variables</b>	<b>VIF</b>
REND	1.293
TANG	1.280
DIM	1.196
LG	1.055
OBF	1.017
RISC	1.038
ID	1.150

## Discussion

As previously mentioned, the main purpose of this study is to analyse the determinants of the capital structure of SMEs in the tourism sector of the Central Region in Portugal, to understand which are the main financing sources (internal or external) of SMEs and identify which is the predominant theory in the financing decisions of the SMEs under study.

In this sense, we proceeded to the analysis of the multiple linear regression model obtained (Table 7) in order to test the hypotheses defined in our empirical study. The model is statistically significant for a level of significance of 0.05, with a low degree of explanatory power, since the coefficient of determination ( $R^2$ ) is 0.266, which means that 26.60% of the variation of the dependent variable is explained by variations in the independent variables of the proposed model. For a significance level of 0.01, all variables are statistically significant.

**Table 7.** *Multiple Linear Regression Model*

	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>	<b>t statistic</b>	<b>p -value</b>
	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>		
<b>Constant</b>	0.438	0.020		22.364	0.000
<b>REND</b>	-0.245	0.038	-0.129	-6.522	0.000
<b>TANG</b>	0.088	0.019	0.093	4.749	0.000
<b>DIM</b>	0.031	0.007	0.087	4.596	0.000
<b>LG</b>	-0.002	0.000	-0.133	-7.479	0.000
<b>OBF</b>	0.298	0.111	0.047	2.684	0.007
<b>RISC</b>	0.019	0.001	0.368	20.814	0.000
<b>ID</b>	-0.004	0.000	-0.225	-12.092	0.000
$R^2$			0.266		
$R^2$ Adjusted			0.264		

Considering the proposed model for the Central Region tourism sector for the years under study, we will proceed to the analysis and validation of the established hypotheses, according to the Trade-Off and Pecking Order theories.

We begin by analysing hypothesis 1, which focuses on the relationship between REND and ENDT. In the model obtained the variable REND ( $\beta = -0.129, p < 0.01$ ) has a statistically significant negative influence over the variable debt. This result does not allow us to validate the previously formulated Trade-Off Theory hypothesis (H1.1.1). However, the negative relationship found, validates the hypothesis H1.1.2 that predicts a negative relationship between the two variables under the Pecking Order theory, i.e., SME's in the tourism sector in the Centre region have a preference for using internal financing over debt. The more profitable a company is, the more likely it is to retain profits and use them to finance itself. Considering the results obtained, one realizes that they are in line with the results obtained by several authors (Bastos and Nakamura 2009, Novo and Vieira 2010, Pacheco and Tavares 2017, Calei 2019), who identify a negative relationship between profitability and debt.

The second hypothesis assumes the existence of a positive relationship between TANG and the debt level of SMEs in the tourism sector in the Centre region, which, in the model obtained ( $\beta = 0.093, p < 0.01$ ), is statistically significant. Thus, hypothesis H.2 is validated and it can be stated that this determinant follows a positive relationship according to the Trade-Off and Pecking Order theories. Thus, the greater the value of tangible fixed assets the greater the financing/guarantee. These relationships were verified in studies previously developed by Serrasqueiro and Nunes (2014), Peixoto (2017) and Calei (2019).

Regarding the third hypothesis formulated, it is concluded that there is a statistically significant positive relationship between the DIM variable and the debt of SMEs in the tourism sector in the Centre region ( $\beta = 0.087, p < 0.01$ ). This conclusion is consistent with Serrasqueiro and Caetano (2014) and Calei (2019). The larger size allows for an increase in the diversification of products and services of SMEs, and, in this sense, also allows for a decrease in the probability of bankruptcy and asymmetry of information between owners and creditors and, consequently, to obtain advantages at the level of external financing. The increase in size also translates into a greater possibility of obtaining profits, and therefore of taking advantage of the tax benefits of debt. These results are therefore in line with the assumptions of the Trade-Off Theory on the one hand, and the Pecking Order theory on the other.

The influence of the variable LG on the level of debt is statistically significant ( $\beta = -0.133, p < 0.01$ ), with an increase in the value of LG causing a decrease in the value of the level of debt of SMEs, as predicted by the Pecking Order theory. This result is in line with the findings of Pereira et al. (2015), Bastos and Nakamura (2009), Pastor and Gama (2013) and Pacheco and Tavares (2017), that firms with high levels of liquidity when they need to finance themselves resort to their own excess liquidity.

As for the OBF, the observed result ( $\beta = 0.047, p < 0.01$ ) does not meet the expected, leading to the rejection of hypothesis 5, within the Trade-Off theory



approach. There is a statistically significant positive relationship between the variable OBF and the level of debt, as Novo and Vieira (2010) present in their study, concerning the long-term debt. The empirical evidence obtained indicates that, the SMEs under study increase their debt as the tax benefits other than debt increase.

The model does not support hypothesis 6 since it presents a positive and statistically significant ( $\beta = 0.368, p < 0.01$ ) relationship between the RISC variable and the level of debt of SMEs in the tourism sector of the Centre region. However, despite contradicting the theories, this relationship is in line with the results obtained by Novo and Vieira (2010), Pereira et al. (2015) and Tavares and Pacheco (2017). Thus, riskier SMEs, which have more debt, may see their agency costs reduced and probably outweigh the expected increase in bankruptcy costs. This association may be sensitive to firm size, as creditors would continue to finance the largest SMEs, even if they were riskier, in order to avoid bankruptcy and thus their losses.

Finally, the negative and statistically significant ( $\beta = -0.225, p < 0.01$ ) relationship between the variable ID and the level of debt allows us to accept hypothesis 7.2, which is in accordance with the assumptions defended in the Pecking Order theory. However, according to the Trade-Off Theory approach, we reject hypothesis 7.1. We conclude that SMEs tend to follow the Pecking Order theory, that is, older firms retain more profits and reduce their recourse to debt, thus the need to resort to debt decreases. Similar results were obtained by Serrasqueiro and Nunes (2012) and Serrasqueiro and Caetano (2014).

Briefly, in Table 8 we can observe which behaviour was expected between the independent variables and the dependent variable (total debt) based on the Trade-Off theory and the Pecking Order theory. One can also observe and compare the expected results and the results obtained from the present study.

**Table 8.** *Expected versus Actual Relationships between the Dependent Variable and the Independent Variables*

Independent Variables	Trade-Off Theory	Pecking Order Theory	Actual relationships	
REND	Positive	Negative	Negative	(S.)
TANG	Positive	Positive	Positive	(S.)
DIM	Positive	Positive	Positive	(S.)
LG	---	Negative	Negative	(S.)
OBF	Negative	---	Positive	(S.)
RISC	Negative	Negative	Positive	(S.)
ID	Positive	Negative	Negative	(S.)

(N.S.) Statistically non-significant, 2. (S.): Statistically significant

## Conclusion

The main purpose of this study was to analyse which of the theories (Trade-Off or Pecking Order) is more followed by SMEs of the tourism sector in the

Central region in Portugal or if the use of one of them does not exclude the other. Simultaneously, it aimed to analyse and identify the main sources of financing and to assess the main determinants that influence the capital structure of such SMEs.

Regarding the determinants that influence the capital structure decisions of the SMEs under study, the empirical evidence obtained allows us to conclude that all variables are statistically significant, but those that most contribute to explain the debt of SMEs are risk and age. This may indicate the problems that SMEs suffer when resorting to debt, in which they are often seen by creditors as companies with higher risk, forcing them to finance their investments using retained earnings, for example their cash-flows. Age seems to mitigate this problem, as older SMEs tend to accumulate more retained earnings.

We identified a negative and statistically significant relationship between profitability and debt, corroborating the Pecking Order theory. This relationship seems to indicate that SMEs in the tourism sector of the Centre region prefer internal financing to external financing. Thus, companies that show higher profitability are able to retain their profits and thus become self-financing, which implies that they do not resort to external financing.

The tangibility of assets influences debt in a positive and statistically significant manner. Thus, companies with a higher level of tangible assets have a higher level of debt. The result obtained suggests that SMEs that hold high levels of tangible assets enjoy greater access to debt, since these can be given as collateral in case of bankruptcy of the company.

A positive relationship between the size and the level of debt of SMEs was identified according to the Pecking Order theory and the Trade-Off theory. The results obtained indicate that as the size of SMEs increases, their debt capacity also increases. The size of firms mitigates the problems of information asymmetry and the risk of bankruptcy, which leads to easier access to debt, as advocated by the Trade-Off and Pecking Order theories.

A positive relationship was identified between other non-debt tax shields and debt, i.e., a relationship contrary to the Trade-Off theory's prediction.

The results show the existence of a positive influence of tangibility of assets, size, benefits other than debt and risk on the level of debt, while for profitability, general liquidity and the age of firms there was evidence of a negative influence. Thus, we conclude that, the influence of profitability and age is in line with the Pecking Order theory. On the other hand, the influence of tangibility of assets and size proves to be in agreement with both theories. Finally, the results for benefits other than debt and for risk were against what was predicted by any of the theories addressed.

Thus, statistical evidence was established proving that all the determinants under study can be related to Pecking Order theory except for OBF and RISC variables. While asset tangibility and size can be linked to both Trade-off theory and Pecking Order theory.

In conclusion, the main sources of financing for SMEs in the tourism sector in the Centre region, considering the results obtained, are the retained funds, i.e., the source of internal financing, which is in line with the Pecking Order theory. Thus, it is the Pecking Order theory that is most followed by the companies

considered in this study. However, considering the results, the possibility of the two theories being followed simultaneously cannot be ruled out.

As guidelines for future research, we suggest the inclusion of macroeconomic factors and new variables such as gross domestic product. Also, for future investigations we suggest a dynamic panel data analysis and the study of SMEs from other regions of the country, and proceed to the confrontation between them, to ascertain the follow-up of the theories by SMEs.

## References

- Abor J, Biekpe N (2009) How do we explain the capital structure of SMEs in sub-Saharan Africa? Evidence from Ghana. *Journal of Economic Studies* 36(1): 83–97.
- Abrantes, C (2013) *Os Determinantes da Estrutura de Capital das Pequenas e Médias Empresas do Setor da Hotelaria*. (The determinants of the capital structure of small and medium enterprises in the hospitality sector). Dissertação de Mestrado: Universidade da Beira Interior.
- Aivazian V, Ge Y, Qiu J (2005) The impact of leverage on firm investment: Canadian evidence. *Journal of Corporation Finance* 11(1): 277–291.
- Bastos D, Nakamura W (2009) Determinantes da estrutura de capital das companhias abertas no Brasil, México e Chile no período 2001-2006. (Determinants of the capital structure of publicly traded companies in Brazil, Mexico and Chile in the period 2001-2006). *Revista Contabilidade & Finanças* 20(50): 75–94.
- Bradley M, Jarrell G, Kim E (1984) On the existence of an optimal capital structure: theory and evidence. *The Journal of Finance* 39(3): 857–878.
- Calei S (2019) *Decisões da Estrutura de Capital com Base na Teoria do Trade off e na Teoria da Pecking order*. (Capital structure decisions based on trade off theory and pecking order theory). Master's Dissertation. University of Beira Interior.
- Campos A, Nakamura W (2015) Rebalanceamento da Estrutura de Capital: Endividamento Setorial e Folga Financeira. (Rebalancing of the capital structure: sector indebtedness and financial slack). *Revista de Administração Contemporânea* 19: 20–37.
- Cardoso J (2013) *Alterações na estrutura de financiamento empresarial: consequências*. (Changes in the corporate financing structure: consequences). Master's Dissertation. University of Aveiro.
- Chirinko R, Singha A (2000) Testing static tradeoff against pecking order models of capital structure: a critical comment. *Journal of Financial Economics* 58(3): 417–425.
- Correa C, Basso L, Nakamura W (2013) A estrutura de capital das maiores empresas brasileiras: análise empírica das teorias de Pecking Order e trade-off, usando panel data. (The capital structure of the largest Brazilian companies: empirical analysis of Pecking Order and trade-off theories, using panel data). *RAM, Rev. Adm. Mackenzie* 14(4): 106–133.
- DeAngelo H, Masulis R (1980) Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics* 8(1): 3–29.
- Degryse H, Goeij P, Kappert P (2012) The impact of firm and industry characteristics on small firms' capital structure. *Small Business Economics Journal* 38(4): 431–447.
- Fama E, French K (2007) The anatomy of value and growth stock returns. *Financial Analysts Journal* 63(6): 44–54.
- Frank M, Goyal V (2003) Testing the pecking order theory of capital structure. *Journal of Financial Economics* 67(2): 217–248.

- Gama A (2000) *Os determinantes da Estrutura de Capital das PME's Industriais Portuguesas*. (The determinants of the capital structure of Portuguese industrial SMEs). Porto: Instituto Mercado de Capitais.
- Harris M, Raviv A (1991) The theory of capital structure. *Journal of Finance* 46(1): 297–355.
- Haugen R, Senbet L (1978) The insignificance of bankruptcy costs to the theory of optimal capital structure. *Journal of Finance* 33(2): 383–393.
- Herdeiro C (2019) *Os determinantes da estrutura de capital no setor da hotelaria em Portugal*. (The determinants of the capital structure in the hospitality sector in Portugal). Master's Dissertation. Polytechnic Institute of Bragança.
- Jensen M, Meckling H (1976) Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3(4): 305–360.
- Kraus A, Litzenberger R (1973) A state-preference model of financial leverage. *The Journal of Finance* 28(4): 911–922.
- Marôco J (2018) *Análise Estatística com o SPSS Statistics*. (Statistical analysis with SPSS statistics). 7<sup>a</sup> Edition. Report Number.
- Marujo M (2008) *Turismo e comunicação*. (Tourism and communication ). RVJ Editores.
- Matias F, Baptista C, Salsa L (2015) Capital structure of Portuguese manufacturing SMEs: an analysis with panel data. *Tourism & Management Studies* 11(2): 120–129.
- Matias F, Serrasqueiro Z (2017) Are there reliable determinant factors of capital structure decisions? Empirical study of SMEs in different regions of Portugal. *Research in International Business and Finance* 40: 19–33.
- McConnell J, Pettit R (1984) Applications of the modern theory of finance to small business firms. *Small Business Firms: Problems in Financing of Small Business* 42(A).
- Modigliani F, Miller M (1958). The American economic. *American Economic Association* 48(3): 261–297.
- Modigliani F, Miller M (1963) Corporate income taxes and the cost of capital: a correction. *The American Economic Association* 53(3): 433–443.
- Myers S (1977) Determinants of corporate borrowing. *Journal of Financial Economics* 5(2): 147–175.
- Myers S (1984) The capital structure puzzle. *Journal of Financial Economics* 39(3): 575–592.
- Myers S, Majluf N (1984) Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial* 13(2): 187–221.
- Novo A (2009) *Estrutura de Capital das Pequenas e Médias Empresas: Evidência no Mercado Português*. (Capital structure of small and medium enterprises: evidence in the Portuguese market). Master's Dissertation. University of Aveiro.
- Novo A, Vieira E (2010) *A Estrutura de Capital das PME: Evidência no Mercado Português*. (The capital structure of SMEs: evidence in the Portuguese market). *Studies ISCA* 4(2).
- Pacheco L, Tavares F (2017) Capital structure determinants of hospitality sector SMEs. *Tourism Economics* 23(1): 113–132.
- Pandula G (2015) Bank finance for small and medium-sized enterprises in Sri Lanka: issues and policy reforms. *Studies in Business and Economics* 10(2): 32–43.
- Pastor C, Gama P (2013) Determinant factors of cash holdings: evidence from Portuguese SMEs. *International Journal of Business and Management* 8(1): 104–112.
- Peixoto A (2017) *A Estrutura de Capital da Indústria Hoteleira em Portugal: Hotéis de 4 e 5 Estrelas*. (The capital structure of the hotel industry in Portugal: 4 and 5 star hotels). Master's Dissertation. Higher Institute of Accounting and Administration of Lisbon.

- Pereira H, Tavares F, Pacheco, L, Carvalho C (2015) Determinants of capital structure of small and medium enterprises of the Vinho Verde. *Revista Universo Contábil* 11(3): 110–131.
- Ramalho J, Silva J (2006) A two-part fractional regression model for the capital structure decisions of micro, small, medium and large firms. *Quantitative Finance* 9(5): 621–636.
- Rodrigues C (2012) Determinantes da Estrutura de Capital O Caso das Empresas Cotadas Portuguesas. (Determinants of capital structure the case of Portuguese listed companies). Master's Dissertation. University of Beira Interior.
- Ross S (1977) The determination of financial structure: the incentive signalling approach. *Bell Journal of Economics* 8(1): 23–40.
- Ross S, Westerfield R, Jaffe J, Jordan B (2011) *Corporate finance: core principles & applications*. 3rd Edition. McGraw-Hill.
- Serrasqueiro Z, Nunes P (2011) The capital structure of Portuguese SMEs: empirical evidence using dynamic panel data. *Transformation in Business & Economics* 10(1): 62–80.
- Serrasqueiro Z, Nunes P (2012) Are young SMEs' survival determinants different? Empirical evidence using panel data. *Applied Economics Letters* 19(9): 849–855.
- Serrasqueiro Z, Caetano A (2014) Trade-off theory versus pecking order theory: capital structure decisions in a peripheral region of Portugal. *Journal of Business Economics and Management* 16(2): 445–466.
- Serrasqueiro Z, Nunes P (2014) Financing behaviour of Portuguese SMEs in hotel industry. *International Journal of Hospitality Management* 43(Oct): 98–107.
- Sardo F, Serrasqueiro Z (2022) Determinants of working capital: empirical evidence on manufacturing SMEs. *Journal of Economic Studies* 49(3): 506–521.
- Sogorb-Mira F (2005) How SME uniqueness affects capital structure: evidence from a 1994-1998 Spanish data panel. *Small Business Economics* 25(Dec): 447–457.

