Capital Structure and Profitability: Panel Data Evidence from the European Tourism Industry

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Abstract: *Finding the optimal debt-equity mix, where shareholders' welfare and firm value are maximized is the goal of every business organization. The literature review revealed a broad spectrum of mixed and contradictory empirical findings on this topic, suggesting that the debate is far from over. This paper aims to assess the impact of capital structure on the profitability of the tourism industry in the European continent. This study is motivated by the importance that the tourism industry has for the economic development of European countries. The sample includes all European-listed firms in the tourism industry. Data is extracted from the Thomson Reuters (Refinitiv) database for a period of 10 years, i.e., 2010-2019. Panel data regression is used to determine the impact of the debt-to-assets ratio on the return on assets. The results reveal that the debt ratio has a significant negative impact on ROA, but not on ROE.*

1. INTRODUCTION

Europe is one of the most attractive touristic destinations worldwide. As a significant contributor to GDP, tourism represents a major economic activity that promotes economic growth and employment. Despite the unprecedented negative impact of the Covid-19 crisis, in 2021, the tourism industry contributed 1450.1 billion dollars to the GDP and 34.65 million jobs in Europe (Statista Research Department, 2022a, 2022b). In addition to being an important economic driver through income generation and employment, tourism is also essential to social and cultural development. Therefore, the performance and prosperity of firms in the tourism industry are of particular interest to the European region. Literature has identified capital structure as an important determinant of profitability and firm value, hence this study aims to investigate the impact of capital structure on the profitability of tourism firms in Europe and offer pertinent recommendations.

Capital Structure represents the composition of a firm's financial resources in terms of borrowed and own capital. Profitability refers to the ability of firms to generate enough revenues that compensate for all their expenses and contribute to the increase of shareholders' wealth. Firms have long been searching for an optimal capital structure that maximizes profits while limiting risk exposure. As a result, many studies have focused on the relationship between capital structure and firm value, with many theories being developed over the years. However, the results have been contradictory when it comes to proving those theories empirically. To date, no magical formula for capital structure has been found.

The remainder of the study is organized as follows. Section 2 contains a review of important literature on capital structure and profitability. The research methodology is described in section 3. Section 4 presents the results, followed by their discussion. Finally, section 5 offers conclusions and implications of the study.

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2.   LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The quest for an optimal capital structure is not new. Probably the most prominent authors that dedicated a lot of effort to this topic are Franco Modigliani and Merton Miller. In 1958 they came up with the so-called capital irrelevance theory. Under specific conditions, such as lack of bankruptcy risk and absence of taxes, they theorized that the value of a firm is not related to its capital structure. In other words, a firm's value would be no different whether a firm was financed entirely from debt or stock (Modigliani & Miller, 1958). However, if the tax-saving effect of debt is considered, they concluded that more debt leads to higher firm value, provided that there is no risk of bankruptcy (Modigliani & Miller, 1963).

Of course, even this modified theory is based on a somewhat unrealistic assumption. Firms in the real world are not immune to bankruptcy. Moreover, there is a direct relationship between debt and bankruptcy. Due to this relationship, firms must carefully balance the costs and benefits of debt. This concept is formalized in the so-called trade-off theory, in which firms maximize their values by increasing the debt portion of their capital structure to the point where the marginal benefits of debt (i.e., tax savings) equal its marginal costs (i.e., bankruptcy costs) (Myers & Majluf, 1984).

Another theory related to the capital structure is the pecking order theory. According to this theory, firms generally prefer internal funds over external financing, and among external financing options, debt is preferable to stock (Myers, 2001; Stiglitz, 1973).

Finally, a fourth relevant theory is the agency cost theory. This theory posits that the conflicting interests of managers and shareholders reflect in their preferences for financing options. For example, managers who are interested in preserving their power within the organization and securing their jobs and compensation tend to avoid borrowing. On the contrary, shareholders prefer borrowing because they see it as a means of exerting stricter control over managers, which may push them to higher levels of efficiency (Jensen & Meckling, 1976).

Table 1. Summary of literature review

Works	Capital Structure (Leverage) relationship with	
	ROA	ROE
Yoon and Jang (2005)		+
Margaritis and Psillaki (2007)	+	
Pouraghajan et al. (2012)	–	–
Salim and Yadav (2012)	–	–
Winantea (2013)		+
Seetanah et al. (2014)	–	–
Shamaileh and Khanfar (2014)	–	
Nasimi (2016)	–	+
Alarussi and Alhaderi (2018)		–
Nguyen et al. (2019)	–	+
Samo and Murad (2019)	0*	–
Zaitoun and Alqudah (2020)	–	
Ayaz et al. (2021)	U	U
Habibniya et al. (2022)	–	0

Note: * Not significant

Source: Authors

Over the years, many empirical studies have been conducted in an attempt to test these theories. The literature review focuses on those studies that have explored the relationship of capital structure with financial performance represented by either ROA, ROE, or both. Some studies have found a positive relationship between higher debt levels and firm profitability. Others have shown that an aggressive capital structure (higher debt levels) is associated with lower financial performance. And some have even come up with mixed results, i.e., different effects on ROA and ROE, respectively. Table 1 presents a summary of some works relevant to this study.

In an attempt to weigh the debate on the relationship between capital structure and profitability, this study examines the impact of the debt ratio (D/A) on the two traditional profitability ratios, ROA and ROE. To this purpose, the following hypotheses are formulated:

Hypothesis one: Debt ratio (DA) negatively impacts firms' return on assets (ROA) in the European tourism industry.

Hypothesis two: Debt ratio (DA) negatively impacts firms' return on equity (ROE) in the European tourism industry.

3. METHODOLOGY

Sample. The sample includes all the listed companies in the European tourism industry for which information is available in the Thomson Reuters (Refinitiv) database. After cleaning the data from firms with incomplete or missing information, the sample comprised a total of 238 firms from 36 countries of the European continent. Financial information for the remaining firms in the sample was extracted for a period of 10 years, from 2010 to 2019, obtaining an unbalanced panel of 2033 firm-year observations. The years before 2010 and after 2019 were excluded from the sample to avoid the effect of the two global crises, i.e., the global financial crisis and the Covid-19 pandemic.

Variables. The variables used in the study are categorized as dependent, independent, and control variables. The dependent variable is profitability which has many indicators. However, following many prior studies (see Table 1), ROA and ROE are used as measures of firm profitability. The independent variable is the capital structure which also may be measured by various financial ratios. However, the most meaningful and commonly used in literature are debt-to-assets and equity-to-assets ratios. Since these two ratios are perfectly inversely correlated, only the debt-to-assets ratio is used. As for control variables, factors that are discussed in the literature and are thought to explain, at least in part, the variation in firm profitability, are selected; asset tangibility (TAN), firm size (S), and liquidity (LQ) are used at a firm level, whereas, at a macroeconomic level, the inflation rate (INF) is used. Table 2 presents the variables' explanation and measurement.

Research Model. The study hypotheses were tested employing panel data regression. Panel data regression is used in many studies in the field and is known to have advantages over other types of regression. Before proceeding with the regression models, as explained above, the data was cleaned from firms with missing or incomplete information. Next, descriptive statistics were obtained, such as mean values, standard deviation, minimum and maximum values, skewness, and kurtosis. Then the pairwise correlation coefficients were acquired to analyze the correlation among the variables and determine how to best use them in the regression models. Finally, the dataset was winsorized at 2% to reduce the effect of the outliers, and the Housman test was run to decide whether to use the fixed effects or the random effects model.

Table 2. Variables description and measurement

Category	Abbr.	Variables Description and Measurement
Dependent variables	ROA	Return on Assets = Net Income / Total Assets
	ROE	Return on Equity= Net Income / Total Equity
Independent variable	D/A	Debt Ratio = Total Debt / Total Assets
Control variables	TAN	Asset Tangibility = Non-current Assets / Total Assets
	S	Size = Ln of Total Assets
	LQ	Liquidity = Current Assets / Current Liabilities
	INF	Inflation Rate = CPI

Source: Authors

The regression model used in this study is the following:

Profitability = f (Capital Structure, Control Variables)

$$PROFITABILITY = \alpha_{it} + \beta_1 CAPITAL\ STRUCTURE + \beta_2\ CONTROL\ VARIABLES + Fixed\ Effects + \mathcal{E}_{it}$$

Where:
Profitability refers to the ROA and ROE of firm *i* in year *t*
Capital structure refers to the Debt-to-Assets ratio of firm *i* in year *t*
Control variables refer to tangibility, size, liquidity, and inflation rate of firm *i* in year *t*.
Fixed effects refer to country and year
$\mathcal{E}_{it}$ is the error term

Based on the above model, the following regression equations were formulated:

$$ROA_{it} = \beta_0 + \beta_1 D/A_{it} + \beta_2 TAN_{it} + \beta_3 S_{it} + \beta_4 LQ_{it} + \beta_5 INF_{it} + \varepsilon_{it} \tag{1}$$

$$ROE_{it} = \beta_0 + \beta_1 D/E_{it} + \beta_2 TAN_{it} + \beta_3 S_{it} + \beta_4 LQ_{it} + \beta_5 INF_{it} + \varepsilon_{it} \tag{2}$$

The data were processed using the Stata statistical package, and all tables, except for Table 1, are generated by Stata.

4.   RESULTS AND DISCUSSION

4.1. Descriptive statistics and variables correlation

Table 3 presents the number of observations, mean values, standard deviation, and min/max values, in addition to the skewness and kurtosis for each variable. Standard deviation, skewness, and kurtosis values reveal that there are not too many outliers in the sample, and the probability distribution is reasonably symmetrical.

Table 4 presents the correlation among the variables. The relatively high correlation between ROA and ROE was expected but is not concerning since they will be used in separate regression models, being the dependent variables in the study. As for the other variables, the correlation matrix reveals a very weak correlation among them, with few cases of mild correlation. The variable correlation matrix is analyzed to identify any collinearity in the variables pool. However, conclusions on the impact of the D/A on ROA and ROE are drawn based on the regression results.

Table 3. Descriptive statistics of the variables (2010-2019)

Variables	Obs.	Mean	Std. Dev.	Min	Max	Pr(Skewness)	Pr(Kurtosis)
ROA	2033	0.037	0.103	-0.329	0.324	0.00	0.00
ROE	2033	0.037	0.348	-1.469	1.007	0.00	0.00
D/A	2033	0.497	0.273	0.028	1.173	0.00	0.00
TAN	2033	0.732	0.239	0.044	0.989	0.00	0.00
S	2033	18.871	2.098	14.437	23.286	0.55	0.00
LQ	2033	2.036	3.515	0.097	19.676	0.00	0.00
INF	2033	1.414	1.345	-1.429	4.625	0.01	0.19

Source: Authors

Table 4. Variables pairwise correlation matrix (2010-2019)

Variables	ROA	ROE	D/A	TAN	S	LQ	INF
ROA	1						
ROE	0.4561*	1					
D/A	-0.0196	0.0297	1				
TAN	-0.0847*	-0.0549*	0.0064	1			
S	0.2093*	0.131*	0.237*	0.32*	1		
LQ	-0.0469*	-0.0113	-0.3979*	-0.3851*	-0.2138*	1	
INF	-0.0003	-0.0061	-0.015	0.0334	0.0002	0.0301	1

Note: * Statistically significant at 5 percent level.

Source: Authors

4.2. Regression results

Based on the Housman test values, it was decided to run the random effects regression model on both D/A-ROA and D/A-ROE relationships. Only the most significant and strongest results are analyzed among the No dummy, Year dummy, Country dummy, and Year & Country dummy for both models.

Table 5. Random effects regression results of D/A with ROA (2010 – 2019)

Variables	No dummy	Year dummy	Country dummy	Year and country dummy
	ROA	ROA	ROA	ROA
D/A	-.055***	-.054***	**-.059***	-.058***
	(-0.011)	(-0.011)	(-0.011)	(-0.011)
TAN	-.096***	-.097***	-.097***	-.097***
	(-0.015)	(-0.015)	(-0.015)	(-0.015)
S	.017***	.017***	.018***	.017***
	(-0.002)	(-0.002)	(-0.002)	(-0.002)
LQ	-.002**	-.002**	-.002**	-.002**
	(-0.001)	(-0.001)	(-0.001)	(-0.001)
INF	-0.001	-0.002	-0.002	-0.002
	(-0.001)	(-0.002)	(-0.001)	(-0.002)
_cons	-.183***	-.176***	-0.094	-0.086
	(-0.04)	(-0.042)	(-0.093)	(-0.093)
Observations	2033	2033	2033	2033
Pseudo R^2	.z	.z	.z	.z
Adj R^2	.z	.z	.z	.z
Hausman test (Prob > chi2)	0.2237	0.2237	0.2237	0.2237

Note: Standard errors are in parentheses
     *** p<.01, ** p<.05, * p<.1

Source: Authors

Table 5 shows the regression results for the impact of capital structure (D/A) on profitability as measured by the return on assets (ROA). The results point to a negative impact of the debt ratio over the return on assets. For every increase by one unit in the debt-to-assets ratio, a decrease of ROA by -.059 points is expected (country dummy model). The results are significant at 1%. These findings support the first hypothesis of the study, where a negative impact of capital structure on ROA was predicted.

Table 6. Random effects regression results of D/A with ROE (2010 – 2019)

Variables	No dummy	Year dummy	Country dummy	Year and country dummy
	ROE	ROE	ROE	ROE
D/A	-0.055	-0.05	-0.062	-0.056
	(-0.041)	(-0.041)	(-0.045)	(-0.045)
TAN	-.226***	-.227***	-.273***	-.274***
	(-0.052)	(-0.052)	(-0.056)	(-0.055)
S	.029***	.029***	.036***	.035***
	(-0.006)	(-0.006)	(-0.007)	(-0.007)
LQ	-0.004	-0.004	-0.004	-0.005
	(-0.003)	(-0.003)	(-0.003)	(-0.003)
INF	-0.004	-0.002	-0.006	-0.008
	(-0.006)	(-0.009)	(-0.006)	(-0.009)
_cons	-.308***	-.351***	-0.148	-0.184
	(-0.117)	(-0.119)	(-0.237)	(-0.231)
Observations	2033	2033	2033	2033
Pseudo R^2	.z	.z	.z	.z
Adj R^2	.z	.z	.z	.z
Hausman test (Prob > chi2)	0.1175	0.1175	0.1175	0.1175

Note: Standard errors are in parentheses
    *** p<.01, ** p<.05, * p<.1

Source: Authors

Table 6 shows the regression results for the impact of capital structure (D/A) on profitability as measured by the return on equity (ROE). The derived results show a negative coefficient on the relationship between the debt ratio and return on equity. However, the results are statistically not significant for either of the No dummy, Year dummy, Country dummy and Year & Country dummy models. Hence, these findings do not allow us to conclude that capital structure has a negative impact on ROA as predicted and the second hypothesis of the study is rejected.

The findings of this study are consistent with Habibniya et al. (2022). The results presented above are further analyzed concerning the four capital structure theories presented in the Literature Review section.

The negative impact of capital structure on ROA in this study does not support the *capital structure irrelevance theory* of Modigliani and Miller, nor their modified theory. The way firms finance their investment projects matters, and firms with greater portions of debt in their capital structure do not perform better. The most sensible explanation for this conclusion is the existence of bankruptcy costs in the real world, which Modigliani and Miller ignored. The results are in line with the *trade-off theory*. There are advantages and disadvantages to borrowing capital, that must be taken into account and balanced carefully by managers to maximize profits and firm value. As for *the pecking order theory*, it is supported by these findings in that, more profitable firms tend to rely less on borrowed capital, pointing to a preference for cash generated by their operations instead.

Finally, according to the *agency cost theory* firms with higher debt ratios would be expected to fare better, since managers would be less relaxed and more under pressure to perform well, and vice-versa. However, this theory does not find support in the study results.

5. FUTURE RESEARCH DIRECTIONS

Future research may be conducted on the capital structure and its role in dealing with financial distress during periods of crises (e.g. global financial crisis and the Covid-19 crisis). For example, it would be interesting to see how firm value was affected during the Covid-19 crisis and what was the role of capital structure in it.

6. CONCLUSION

This study explores the impact of capital structure on the financial performance of European firms in the tourism industry. Despite the sheer amount of studies on this topic over the years, both conceptual and empirical, the debate is not settled yet. Furthermore, each industry has its characteristics, and every contribution is welcomed. The focus is on the European tourism industry due to its significance and weight in the total economic output of the continent. Fixed effects panel regression is used to determine the impact of the capital structure represented by debt-to-assets (D/A) ratio on the firm financial performance represented by ROA and ROE. The results reveal a significant negative relationship between D/A and ROA but not significant between D/A and ROE. By focusing on a single industry and by taking a sizeable sample, this study contributes to the ongoing debate on this important relationship and can be used by firms to attain an equilibrium between the two main financing sources, borrowings and own capital.

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