

Tax Policy and Firms' Financial Choices: Empirical Evidence from the Dominican Republic

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Abstract: This study aims at investigating the effects of tax policy on the capital structure of companies in an emerging economy, such as that of the Dominican Republic, using data from the tax returns of each individual company. Indeed, despite the vast and rich literature investigating the financial behaviour of firms, only in the last decade the attention has also been focused on emerging economies. In this prospective, a fixed-effects (FE) estimation technique has been employed based on financial and economic indicators opportunely extracted by a data-set provided by the Ministry of Finance to the World Bank as part of a collaboration on the evaluation of the fiscal policy. The use of direct information on corporate tax returns, confidential data hardly made public or provided to scholars, allows to add a further contribution to the literature debate on the relationship between taxation and the financial behaviour of firms. The results of the analysis are in line with the research hypothesis showing how the individual determinants significantly explain the capital structure of companies.

Keywords: Capital Structure, Tax incentives, Dominican Republic

1 Introduction

After the seminal papers of Modigliani and Miller (1958, 1963), the literature has developed an intense debate that has led to the development of several theories to explain firms' financial behaviour. In this perspective, the trade-off theory (Kraus and Litzenberger 1973), the theory of hierarchical order (Myers 1984; Myers and Majluf 1984), the theory of agency costs (Jensen, 1986), the theory of market timing (Baker and Wurgler 2002; Hovakimian 2006) and the theory of equity returns (Welch 2004) are the ones that have received the most support.

Although the different approaches provide the theoretical bases for understanding the fundamental determinants of the capital structure, the empirical results derived from applying each of these theories have shown conflicting results. This is because the company's characteristics, the sector to which it belongs and the economic context of reference significantly influence the capital structure (Bancel and Mitto 2004; De Jong et al. 2008, Sensini 2017).

In the context outlined briefly, this paper's main objective is to investigate the determinants of the capital structure in an emerging economy, such as that of the Dominican Republic.

In particular, based on trade-off theory and hierarchical order theory, we used the main determinants suggested by the literature to explain firms' financial behaviour (size, profitability, asset structure, growth). In this regard, the literature (Črnigoj and Mramor 2009) has suggested that emerging economies' legal, institutional and cultural structure is significantly different from that of developed markets (Wald 1999; Chalmers et al. 2020). Consequently, firms' financial behaviour in these countries is still an open question capable of providing further and useful empirical evidence on the validity of the various theories.

A fixed-effects (FE) estimation technique has been employed based on selected financial and economic indicators opportunely extracted by a data-set provided by the Ministry of Finance to the World Bank as part of a collaboration on the evaluation of the fiscal policy.

In this regard, most previous empirical studies have found a positive association between taxation and financial leverage. However, the empirical results are often conflicting due to the different methods used to estimate the tax effect on the capital structure. The common problem of most of these studies is that the impact of taxation on the capital structure is estimated based on balance sheet information. Consequently, the possible divergence between accounting and (estimated) tax income may suggest misleading conclusions. To avoid estimation errors, it would be necessary to use direct information on corporate tax returns. However, tax returns contain confidential information and, therefore, these data are hardly made public or provided to scholars. As best as we know, studies that have investigated the tax impact on the capital structure based on effective taxation are quite rare.

Therefore, our study differs from previous research in that it uses data from the tax returns of each company. From this perspective, this paper's results can provide an important contribution to the literature, providing reliable evidence, precisely as it is based on effective taxation, on the relationship between tax incentives and financial behaviour. Furthermore, empirical findings can be useful to the economic and political actors of the Dominican Republic.

The paper is organised as follows. Section 2 provides a review of the relevant literature, while the next section briefly describes the tax regime of the Dominican Republic. Section 4 illustrates the methodology. The findings and commentary on the results are reported in section 5. Finally, section 6 contains the concluding remarks.

2 Literature Review

The models of Modigliani and Miller (1958, 1963), although not applicable to the real economy, provided the basis for the broad and intense debate on capital structure. Sixty years after the authors' first pioneering article, the debate remains open, and the question remains unresolved (Myers 2001).

Among the several theories developed by the literature, the trade-off theory and the pecking order theory are the most appropriate to the reference context that is the object of our investigation (De Jong et al. 2008; Chen et al. 2021).

The trade-off theory (Kraus and Litzenberger 1973), taking up Modigliani and Miller's approach, suggests the existence of an optimal capital structure for each firm, based on three fundamental elements: tax shields, bankruptcy costs and agency costs (Sensini 2020).

In this perspective, firms' financial decisions aim to achieve an optimal debt ratio, in which the tax benefits deriving from the greater indebtedness can offset the greater costs and risks of financial difficulties (Jensen and Meckling 1976; Cassar and Holmes 2003).

Consequently, until the optimum level is reached, leverage is beneficial and therefore, companies prefer to use debt even if they have internal funds.

The pecking order theory (Myers 1984; Myers and Majluf 1984) suggests that firm financing decisions follow a hierarchical order of preference based on the lowest information asymmetry between firm and investors. In this perspective, companies prefer to use internal funds to finance investments, as long as

these funds are sufficient. Only in case of insufficient internal resources will companies resort to external financing sources, preferring debt first and, ultimately, equity (Cosh and Hughes 1994; Vos et al. 2007). These two theories have paved the way for numerous empirical research that verified the two different approaches' validity in different economic contexts. The results, as widely documented by the literature on the subject, are however conflicting (Rajan and Zingales, 1995; Harris and Raviv 1991; Booth et al. 2001; Fama and French 2002; Faulkender and Petersen 2006; Frank and Goyal 2009; Chakraborty 2010; Mateev et al. 2013; among others).

For this study's purposes, we followed the approach of these two theories, believing that this setting can better explain the financial behaviour of companies in an emerging economy, such as the Dominican one (Chen et al. 2021). Furthermore, the two approaches are complementary and do not conflict so that they can be used together.

In this perspective, following an empirical approach consolidated in the literature (Cassar and Holmes 2003; Chen 2004; Deesomsak et al. 2004; Abor 2008; de Jong et al. 2008; Frank and Goyal 2009; Psillaki and Daskalakis 2009; Degryse et al. 2012; Sbeti and Moosa, 2012; Andres et al. 2014; Sensini 2020), we studied the determinants of the capital structure of firms (Total Debt, Debt long-term and short-term debt) using some company-specific factors, such as size, profitability, the tangibility of assets and growth.

Furthermore, we also assessed the impact of fiscal incentives on the capital structure, comparing the companies' financial choices benefiting from the incentives with non-recipients.

To analyse the companies' financial behaviour, we used as dependent variable the three variables that determine the capital structure: total debt, medium and long-term debt, and short-term debt. Independent covariates (Size, Profitability, Assets tangibility, Growth) are selected based on the empirical literature (Chittenden et al. 1996; Michaelas et al. 1999; Cassar and Holmes 2003; Sogorb-Mira 2005; Abor 2008; Frank and Goyal 2009; Kayo and Kimura 2011; Degryse et al. 2012; Palacín-Sánchez and Ramírez-Herrera 2013; Sensini 2017; Ramli et al. 2019; Rao et al. 2019; among others).

The final variables included in the analysis and their measures are summarized in Table 1.

Table 1: Variables of Interests

ID	Name	Measure
Dependent Variables		
TD _{t,i}	Total debt	Total Liabilities/Total Assets
MLD _{t,i}	Medium and long-term debt	Non-current Liabilities/Total Assets
STD _{t,i}	Short-term debt	Current Liabilities/Total Assets
Independent Variables		
TAX _{i,t}	Incentives	Dummy =1 if firm receives the incentive
SIZE _{i,t}	Size	Logarithm of Total Assets
PROF _{i,t}	Profitability	EBIT/Total Assets
ROE _{i,t}	Profitability	EBIT/Net Assets
TAS _{i,t}	Tangibility Asset structure	Tangible Assets/Total Assets
GROW _{i,t} TA	Growth Total Assets	(Total Assets _{i,t} – Total Assets _{i,t-1})/Total Assets _{i,t-1}
GROW _{i,t} SAL	Growth Sales	(Total Sales _{i,t} – Total Sales _{i,t-1})/Total Sales _{i,t-1}

As detailed in Table 1, we use two indicators to assess profitability and growth, to gather more information. Furthermore, to investigate the effects of the tax incentive policy, we have included a fictitious variable, TAX, which indicates whether the company receives tax incentives or not.

3 Fiscal Incentives and Corporate Income Tax

For the sake of completeness, a brief description of the tax system currently in force in the DR is provided below, to better understand the impact of the tax variable on the financial behaviour of companies.

The Tax Code governs taxation in DR (Law No. 11-92 of 31 May and its subsequent amendments) and is based on territoriality. Therefore, all income produced within the DR is subject to taxation.

Over the last 20 years, following fierce tax competition with other Caribbean countries (Chai and Goyal 2008; Nassar 2008; Schipke et al. 2013), the DR has introduced a complex and articulated series of tax incentives to encourage business investments and promote various development objectives (Amendola et al., 2020).

The main tax incentives relate to subsidies on value-added tax (VAT), those on corporate income tax (CIT) and those relating to the establishment of special economic zones (SEZs).

On average, in 2012-2015, the revenues deriving from the CIT's application represented approximately 20% of the total tax revenue and 1.6% of GDP. However, the DR's fiscal expenses to pursue its economic development objectives and incentivize businesses exceeded 6% of GDP. A much higher percentage than other countries with economic characteristics comparable to DR (Amendola et al. 2018). Consequently, the Dominican Republic is reviewing fiscal policy to reduce the impact of fiscal spending on GDP and limit its effects on the economy.

The tax benefits' determination due to each company is rather complicated, as it is influenced by various variables, such as the sector to which it belongs, the activity carried out, the region, the type of investment, etc.

Consequently, any estimate of tax benefits based on accounting data alone would be somewhat arbitrary and, at the same time, unreliable.

This document, exceeding these limits, uses the data of the corporate tax returns. This approach allows basing the survey on the actual tax benefits, highlighting the real impact on companies' financial behaviour.

Some previous research has studied the effects of VAT and CIT tax breaks on investments and growth regarding the Dominican Republic (Amendola et al. 2018). For the rest, no studies have investigated the impact of tax effects on companies' capital structure. The Dominican Republic Ministry of Finance provided tax, economic and financial information to the World Bank. The data cover the period 2012-15 and are anonymised. Therefore, we have a large dataset containing all the companies' information based in the DR, but we are unable to match the individual records with the company name.

4 Methodology

In the evaluation of public policies and programs, the approach represented by “true” or “natural” experiments based on random assignments it is generally considered one of the most useful ways for analysing causal relationships (LaLonde, 1986).

However, in the context of the present analysis, treated and non-treated enterprises often differ in many respects that may affect the results of the analysis (i.e. selection biases). Therefore, in order to evaluate the program and given the lack of an experimental design, an alternative approach have to be adopted such as a quasi-experimental approach that compares the results between the treatment and the control groups, while bearing in mind that not all the treatments are randomly assigned. Due to the need of controlling for unobserved heterogeneity, this paper examines the effects of tax incentives on firm

capital structure indicators by employing fixed-effects (FE)¹ estimation techniques considering both firms and time fixed effects².

As detailed in the above (Table 1), the indicators of firm capital structure (i.e., the dependent variables) include total debt (TD), medium and long-term (MLD) and short-term debt (STD). The selected k=6 explanatory variables are TAS, PROF, ROE, GROWTH TA, GROWTH SAL and SIZE. The indicator variable TAX, that allows to discriminate for the effects of the fiscal policy, represents a relevant independent variable in the equation (1) estimated on the total sample.

Namely, the following equation is estimated for each of the three considered dependent variables using the whole sample information:

$$Y_{it} = Tax_{it} + aX_{it} + \mu_i + u_t + e_{it} \quad (1)$$

where

- Y_{it} is a dependent variable for firm i at time t .
- Tax_{it} is a dummy variable indicating whether the firm receives Tax incentives, which takes value one if the firm receives the Fiscal Incentive, or zero otherwise.
- X_{it} is a vector of k firm-level explanatory.
- μ_i represents unobserved heterogeneity due to firm-level differences in efficiency and managerial skill.
- u_t represents time specific fixed effects and,
- e_{it} is an error term assumed to be independently and identically distributed with a mean of zero and a variance of σ^2

5 Results and Discussion

As a first step, we have pre-cleaned the data extracting a panel of full information. The companies with a zero Net Assets value have been excluded from the analysis and the variables have been controlled for the effect of outliers. The final sample consists of 31.704 companies observed from 2012 to 2015.

The results of a preliminary statistical analysis have been reported in table 1 for the three dependent variables and the identified regressors. In addition, we have also investigated for the presence of linear dependence among the considered variables. The results of the bivariate correlation measures, reported in Table 3, show as expected a moderate correlation among regressors that allows to avoid multicollinearity.

¹ In this model (FE) it is assumed that the intercept is deterministic and varies from individual to individual, or for individual and over time. We want also to point out that in order to justify the choice of Fixed effects two tests are performed. The first one was the Ramsey's¹ test which null hypothesis consider that the data are not affected by omitted variables problems. Rejecting the null hypothesis ($p < 0.05$ -as in our case) means that a stronger model than the OLS is required to capture the variability that affects the dependent variable due to the omitted variables. (See Ramsey 1969 for a discussion).

The second one is the Hausman test-related to the choice between Fixed and Random effect- that considerers as a null hypothesis the one according to which the difference in the coefficients is not systematic. Rejecting the null hypothesis ($p < 0.05$ -as in our case) allows us to assert that the difference in the coefficients of panel analysis is systematic (i.e. the model is characterized by fixed effects) (See Hausman 1978 for a discussion).

² In most Econometric application, a FE structure does not mean that the individual effect is being treated as nonrandom; but that one is agreeing for arbitrary dependence between the unobserved effects (Firms fixed effects in this context) and the observed explanatory/independent variables. (see Wooldridge 2010 for a discussion).

Table 2: Main Statistics of dependent and independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
TAS	126,816	-3.33e+07	3.85e+08	-3.77e+10	2.09e+10
PROF	126,816	635167.4	4.19e+08	-1.47e+11	1.10e+10
ROE	126,816	-.1963773	3.130.819	-6.500.951	7.994.728
GROW TA	126,816	7.35e+07	7.90e+08	-.99	8.46e+10
TAX	126,816	.332876	.4712444	0	1
GROW SAL	126,816	7.43e+07	9.02e+08	-.99	1.16e+11
SIZE	126,816	1.512.782	2.157.869	-460.517	2.516.115
TD	126,816	.6793006	175.726	0	5.675.172
MLD	126,816	.0639408	160.519	0	5.666.556
STD	126,816	.6153599	.7294321	0	1.282.841

Table 3: Correlation Matrix

	TAS	PROF	ROE	GROWTA	GROWSAL	SIZE	TD	MLD	STD
TAS	1.000								
PROF	-0.0413	1.000							
ROE	-0.0008	0.0004	1.000						
GROW TA	-0.7755	-0.0027	0.0008	1.000					
GROW SAL	-0.4949	0.0318	0.0007	0.6178	1.000				
SIZE	-0.2370	0.0004	0.0049	0.2516	0.1987	1.000			
TD	0.0040	-0.0011	0.0004	-0.0057	-0.0040	-0.0170	1.000		
MLD	-0.0027	-0.0003	-0.0000	0.0030	0.0014	0.0128	0.9569	1.000	
STD	0.0227	-0.0028	0.0015	-0.0296	-0.0186	-0.1006	0.2831	-0.0078	1.000

The results of the Fixed Effect estimations, as specificity in equation (1), have been reported in Table 4, to evaluate the impact of all the variables considered on the capital structure.

Table 4: Effects of Tax Incentive on TD, MLD, STD-Fixed Effects estimation

	(1)	(2)	(3)
VARIABLES	TD	MLD	STD
Tax	0.170*** (0.0499)	0.0571 (0.0489)	0.113*** (0.00728)
TAS	-1.20e-11 (1.06e-11)	-3.96e-12 (5.20e-12)	-8.07e-12 (1.27e-11)
PROF	2.98e-12 *** (5.09e-13)	3.38e-12*** (1.99e-13)	-3.98e-13 (5.46e-13)
ROE	0.000533*** (0.000176)	0.000123* (6.81e-05)	0.000410* (0.000220)
GROW TA	-4.99e-13 (8.68e-12)	4.54e-12 (3.62e-12)	-5.04e-12 (9.44e-12)
GROW SAL	-1.19e-12 (1.59e-12)	-4.39e-12*** (1.24e-12)	3.20e-12 (2.35e-12)
SIZE	-0.00609 (0.00832)	0.00307 (0.00591)	-0.00916 (0.00686)
Constant	0.700*** (0.117)	-0.00620 (0.0667)	0.706*** (0.105)
Observations	126,816	126,816	126,816
N. of enterprises	31,704	31,704	31,704
Method	FE	FE	FE

The treatment variable is the tax incentive. The independent variables are TAS, PROF, ROE, GROWTH TA, GROWTH SAL and SIZE. Standard errors are reported in parenthesis. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

The results show a positive and significant relationship of taxes on total debt and short-term debt, suggesting that firms benefiting from the tax benefits prefer to finance investments with debt rather than internal resources.

Contrary to what is predicted by both theories, asset tangibility has an insignificant relationship with debt. As suggested by the literature, in emerging economies, the use of such assets as collateral is fundamental, as creditors' protection mechanisms are generally weaker than in more developed economies (La Porta et al. 1998; Alvarez et al. 2021). However, our results suggest that the more significant presence of tangible investments does not seem to be an element capable of conditioning companies' financial choices.

In line with the trade-off theory, the first measure of profitability (PROF) shows a positive and significant relationship with TD and MLD, suggesting that the most profitable firms prefer to finance investments with debt.

The second measure of profitability (ROE) confirms these results, highlighting a positive and significant relationship also with short-term debt (STD).

These results are of particular relevance in an emerging economy, where financial markets are less developed, and credit is mainly focused on bank financing (Alvarez et al., 2021). In this perspective, profitability represents a fundamental element to favour financial equilibrium in the short and medium-long term.

The empirical results are consistent with some of the literature (Wiwattanakantang 1999; Karadeniz et al. 2009; Vo 2017), but diverge from those found by other scholars, helping to fuel the controversial debate between firms' profitability and financial behaviour (Tongkong 2012; Chauhan 2016).

The first growth measure (GROW TA) shows an insignificant relationship with debt, in strict consistency with results relating to assets' tangibility. Empirical findings further confirm that these investment decisions appear not to influence debt.

The second growth measure (GROW SAL) shows a negative and significant relationship with medium- and long-term debt, suggesting that companies that increase turnover prefer to use internal resources rather than debt.

These results are partially consistent with the trade-off theory, which has highlighted that financing costs can increase the risk of financial difficulties (Harris and Raviv 1991). For the rest, empirical findings are in line with what has been highlighted by previous research (Degryse et al. 2012; Hall et al. 2012; Michaelas, 1999; Oino and Ukaegbu 2015; Vo 2017).

Finally, size has an insignificant relationship with debt, suggesting that this variable does not influence firms' financial behaviour. Therefore, size does not seem to represent a determining factor in explaining Dominican companies' financial behaviour, unlike what emerged in other studies carried out in different economic contexts (Michaelas et al. 1999; Cassar and Holmes 2003; Hall et al. 2004; Deesomsak et al. 2004; Salawu and Agboola 2008).

6 Concluding Remarks

Over the past sixty years, numerous studies have tried to explain firms' financial behaviour based on the different theories suggested. Despite the vast and rich literature, the empirical results deriving from the application of each of these theories have shown conflicting results. The empirical analyses initially focused only on companies in developed economies, also due to the greater availability of data.

Only in the last decade, different theories have been tested in emerging economies. Therefore, in the first place, the main purpose of this paper was to investigate the determinants of the capital structure in an emerging economy, testing the trade-off theory and the pecking order theory, using the main determinants suggested by the literature (size, profitability, tangibility and asset growth). Secondly, given that the Dominican Republic has introduced a series of tax incentives to encourage the establishment and development of businesses, we also investigated the impact of tax policy on the financial behaviour of businesses.

To assess each determinant's impact on firms' financial behaviour, we used a fixed-effects (FE) estimation model. The data covered the period 2012-2015 and were provided by the Ministry of Finance to the World Bank as part of a collaboration on current fiscal policy analysis.

The results present various food for thought. In particular, fiscal incentives have shown a positive and significant relationship on total debt and short-term debt, suggesting that firms benefiting from tax benefits prefer to finance investments with debt rather than internal resources. Consistent with the trade-off theory, profitability has shown a positive and significant relationship to debt, suggesting that more profitable companies prefer to finance investments with debt. Contrary to what is predicted by both theories, assets' tangibility has an insignificant relationship with debt. Our results suggest that the most significant presence of tangible investments does not seem to be an element capable of conditioning companies' financial choices. Contrary to what is predicted by both theories, assets tangibility did not represent a relevant variable to explain indebtedness. Finally, like what has emerged in other studies, growth and size did not significantly affect debt.

This paper can be relevant from several points of view. To the best of our knowledge, this study is the first research that investigates businesses' financial behaviour in the Dominican Republic, using a large

dataset of information containing approximately 36,000 firms of varying sizes. Previous research in various emerging economic contexts has mainly focused on companies listed on the stock exchange. In this perspective, this study provides further empirical evidence, more representative of the business context, of the capital structure in an emerging economy, such as that of the Dominican Republic. Second, this study is one of the few that investigates the relationship between tax incentives and corporate capital structure, using data from companies' tax returns. From this perspective, the results allow a reliable representation of the previous relationship, eliminating the possible distortion effect determined by the tax variable's estimate. Finally, the empirical results can be useful for entrepreneurs and managers of Dominican companies to improve their financial decisions and for policymakers to assess the impact that tax policies have on companies' financial behaviour.

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