



## Determinants of the effective tax rate in the tourism sector: a dynamic panel data model

### Determinantes del tipo impositivo efectivo en el sector turístico: un modelo dinámico con datos de panel

**José Moreno-Rojas**

University of Seville, Faculty of Tourism and Finance, Avda. San Francisco Javier, 41018 (Seville), Spain,  
jrojas@us.es

**M. Rosario González-Rodríguez**

University of Seville, Faculty of Tourism and Finance, Avda. San Francisco Javier, 41018 (Seville), Spain,  
rosaglez@us.es

**Rosario Carmen Martín-Samper**

University of Seville, Faculty of Tourism and Finance, Avda. San Francisco Javier, 41018 (Seville), Spain,  
rmartin@us.es

#### Abstract

This paper presents a dynamic model of the Effective Tax Rate (ETR) in the tourism sector. A dynamic model where the lagged endogenous variable ETR has been included as a regressor to identify the dynamic structure of the variable due to the existence of temporal adjustments between the short and long run in ETR payments has been estimated. The empirical analysis based on a panel data set over the 2008-2013 period explores the determinants of the ETR variable by using a Generalised Method of Moments (GMM) estimator controlling for heterogeneity in the tourism sector. The Arellano-Bond system GMM estimator has been used to estimate the model. The study seeks to shed light on the determinants of tax burden in the tourism sector covering the lack of studies on this topic. The findings obtained suggest that the ETR borne is determined by size, financing structure and type of entity. We deem the finding of the existence of non-linear relationships between ETR and size and financing structure relevant.

**Keywords:** Effective tax rate, asset composition, firm size, financial structure, equity, dynamic panel data, ROA.

#### Resumen

Este artículo presenta un modelo dinámico para el Tipo Impositivo Efectivo (TIE) en el sector turístico. Este modelo dinámico ha sido estimado usando la variable endógena retardada TIE como regresor para identificar la estructura dinámica de dicha variable, debido a la existencia de ajustes entre el corto y largo plazo en los pagos del TIE. El análisis empírico basado en datos de panel en el periodo 2008-2013 explora los determinantes de la variable TIE utilizándose el estimador del Método Generalizado de Momentos (GMM) controlando la heterogeneidad en el sector turístico. El estimador de Arellano-Bond ha sido utilizado para estimar el modelo. Este estudio busca arrojar luz sobre los determinantes de las cargas impositivas en el sector turístico debido a la escasez de estudios en esta materia. Los resultados obtenidos sugieren que el TIE se encuentra determinado por el tamaño, la estructura financiera y el tipo de empresa. Igualmente consideramos relevante el hallazgo de relaciones no lineales entre el TIE y el tamaño y la estructura de financiación.

**Palabras clave:** Tipo impositivo efectivo, tamaño de la empresa, estructura financiera, datos de panel dinámico, ROA.

#### 1. Introduction

The aim of this article is to verify which are the determinant factors of the Effective Tax Rate (ETR) in two types of important touristic companies, such as hotels and travel agencies. Moreover, the work tries to discern if these determinant factors are different in both types of companies.

This paper presents a dynamic model of the Effective Tax Rate in the tourism sector. A dynamic model where the lagged endogenous variable ETR has been included as a regressor to identify the dynamic structure of the variable due to the existence of temporal adjustments between the short and long run in ETR payments has been estimated. The empirical analysis based on a panel data set over the 2008-2013 period explores the determinants of the ETR variable by using a Generalised Method of Moments (GMM) estimator controlling for heterogeneity in the tourism sector. The Arellano-Bond system GMM estimator has been used to estimate the model. The study seeks to shed light on the determinants of tax burden in the tourism sector covering the lack of studies on this topic.

The findings obtained suggest that the ETR borne is determined by size, financing structure and type of entity. We deem the finding

of the existence of non-linear relationships between ETR and size and financing structure relevant.

This article could help legislators to take into account the determinant factors of tax burden when designing a specific fiscal framework for this type of organisations, due to their significant contribution to the Spanish economy.

A social implication of the study could be its possible contribution to the preparation of a specific framework for these types of companies, because of their particular features, its relevant role in employment generation in Spain and, finally, because it contributes to establish equilibrium for the balance of payments.

This study represents the first approach to the study of determinants of the tax burden by two types of companies that are very relevant within the tourism sector, such as hotels and travel agencies.

This article is structured as follows. Section 2 shows some definitions of ETR and gives a summary of prior research, analysing the explanatory variables of the ETR. Section 3 proposes the hypotheses to be tested. Section 4 explains the model specification and how the sample was selected. Section 5 displays

results and the findings of our research and the main conclusions are given in section 6.

## 2. The Effective Tax Rate (ETR): literature review

Undoubtedly, the tax burden arising from a tax on profits represents a factor of great relevance from both a microeconomic and a macroeconomic standpoint, given its implications in company management and in the design and development of policies of a national nature (Giannini and Maggiulli, 2002). The empirical finding that not all companies bear the same tax burden has represented a significant incentive for research in this field, as proven differences in tax burden are contrary to the idea of equity in taxation (Adhikari, Derashid and Zhang, 2006).

The use of a statutory tax rate (STR) for the measurement of this tax burden is not adequate, as it does not take into account variables such as temporal differences, compensation of negative tax bases, deductions and allowances, etc. On the other hand, the so-called effective tax rate (ETR) does turn out to be a good indicator of tax burden as its calculation takes into account all relevant variables for calculating the tax (Fonseca, Fernández and Martínez, 2011). The variable of effective tax rate began to gain notoriety in 1973, when the Securities Exchange Commission (SEC) reformed the regulations related to the information to be supplied in the annual accounts of publicly-traded companies regarding the tax on profits, highlighting the usefulness of ETR as an analysis tool (Calvé, Labatut and Molina 2005, p. 877).

There have been different definitions of the ETR, among which we can highlight, on the one hand, the one that defines it as the ratio between the expenditure paid due to tax on profits and the accounting profit or loss before taxes (accounting ETR) and, on the other hand, the one that conceptualises it as the ratio of tax liability from tax on profits to the accounting profit or loss before taxes (tax ETR) (Martínez, 2015, p. 69). A comprehensive overview of these can be found in Molina (2005, pp. 46-55). You can also see Nicodème (2001).

The first one emphasises the accrual principle as the expenditure for tax on profits appearing in the profit and loss statement is calculated independently of the financial flow stemming from it, while the second definition is related to the cash basis, as it focuses on the amount paid by the company for the tax. Also from a tax standpoint, there is another definition of the ETR, which considers it to be the ratio of tax liabilities from the tax on profits to the tax base, which also measures tax burden but relates it to the revenue estimated by the Administration from the point of view of tax calculation.

Therefore, accounting ETR has an economic meaning that goes beyond the amounts effectively paid for the tax since, at least purely theoretically, the deductible assets for temporal differences, representing taxes paid in advance, will be recovered in the future, while liabilities for payable temporal differences, which entail deferral in tax payment, will also be paid in future tax years. In other words, by using the expense for tax on profits as an indicator of the tax burden borne during the tax year, only the impact of permanent differences and deductions and rebates is being taken into account, without considering the effect of temporal differences. This approach appears adequate when attempting to analyse the effective tax burden borne by companies as a result of the activities they perform during each

tax year, regardless of the moment in time where they have to deal with payment of the tax (Molina, 2005, p. 55).

The objectives sought by research on the ETR have namely been: (1) To study the consequences of modifications to national tax law on the ETR (Calvé, Labatut and Molina, 2005; Fernández, 2004; Fernández, Martínez and Álvarez, 2004; Garrido and Garrido, 2006; Gravelle, 1982; Guenther, 1994; Gupta and Newberry, 1992; Manzon and Smith, 1994; Martínez, Fernández and Álvarez, 2001; Scholes and Wolfson, 1992; Shevlin and Porter, 1992); (2) To perform a comparative analysis of different countries (Buijink Janssen and Schols, 2002; Collins and Shackelford, 1995; Devereux and Griffith, 1998; Fernández and Rubín, 2002; Fernández, Martínez and Álvarez, 2008; Jacobs and Spengel, 2000; Kim and Limpaphayom, 1998; Molloy, 1998); and (3) To research the factors that determine tax burden (Adhikari et al., 2006; Chen, Chen, Chen and Shevlin, 2010; Feeny, Gillmann and Harris, 2006; Fernández, 2004; Fernández and Martínez, 2009 and 2011; Fonseca et al., 2011; Graham, 1996; Gupta and Newberry, 1997; Holland, 1998; Kern and Morris, 1992; Molina, 2012; Monterrey and Sánchez, 2010; Omer, Molloy and Ziebart, 1993; Porcano, 1986; Richardson and Lanis, 2007; Stickney and McGee, 1982; Wang, 1991; Wilkie and Limberg, 1993; Zimmerman, 1983).

In connection with this last line of research related to the factors that determine and condition tax burden, which serves as a framework for this paper, we summarise below which of these factors have proved the most relevant in the research studies carried out. Focusing on the literature review, this paper attempts to shed light to this topic by specifying a dynamic model in the tourism sector where no studies have been carried out thus far.

### *Size and ETR*

This variable has been extensively used in studies related to the tax burden borne by companies, with two opposite approaches being identifiable. On the one hand, the hypothesis of political costs (Zimmerman, 1983) maintains that companies of a greater size bear a greater tax burden due to the greater control that governmental authorities exert over them, so that their effective tax rates must be higher.

On the other hand, it can also be argued that large companies bear a lower tax burden due to circumstances such as greater availability of resources they can devote to tax planning and to the adoption of accounting practices aimed at the reduction of taxes, without forgetting that, precisely due to their size, companies of this type are able to become genuine pressure groups that may influence government tax policies.

The conclusions obtained in the studies performed along these lines do not show any conclusive evidence. There are studies showing a positive relationship between size and tax burden, among which we can mention those by Calvé et al. (2005), Derashid and Zhang (2003), Fonseca et al. (2011), Kim and Limpaphayom (1998), Omer et al. (1993), Plesko (2003), Richardson and Lanis (2007) and Zimmerman (1983), which would confirm the hypothesis of political costs. However, other authors, such as Chen et al. (2010), Harris and Feeny (2003), Heshmati, Johansson, and Bjuggren (2010), Mills, Erickson and Maydew (1998), Monterrey and Sánchez (2010), Porcano (1986), Tran (1997, 1998) and Wang (1991) show the existence of a negative relationship, i.e. an inverse relationship, between size and tax burden.



Lastly, other research studies have not found significant relationships between size and effective tax rates, among which we can highlight those by Feeny et al. (2006), Fernández (2004), Gupta and Newberry (1997), Hsieh (2013), Liu and Cao (2007), Stickney and McGee (1982) and Wilkinson, Steven and Geoff (2001).

This heterogeneity of findings may be due to different scopes, both geographical and temporal, used in the studies reviewed, as well as differences in the sample selection process, in the definitions of the effective tax rate and in the data size and aggregation techniques used (Wilkie and Limberg, 1990).

### 3. Hypothesis

In view of these inconclusive results and according to Fonseca et al. (2011, p. 497-498), one could contemplate the possibility of the existence of a non-linear relationship between size and the effective tax rate, so that the relationship between these two variables may be conditioned by the degree of size. Consequently, there could be a shift in the relationship when companies exceed a certain size (Fernández and Martínez, 2011, p. 394). This argument drives us to consider the following hypothesis:

H<sub>1</sub>: Companies with a size exceeding a certain threshold bear a lower tax burden, given their greater tax-planning ability.

#### *Asset Composition and ETR*

From a theoretical perspective, one might consider that companies where depreciable fixed assets represent a high proportion of total assets (high capital intensity) must bear a tax rate lower than others where these fixed assets play a less important role, due to both the deductibility of depreciation allowances for the calculation of the amount of tax on profits and to the existence of tax incentives in many countries for the acquisition of fixed assets, in the form of various deductions and credits.

Several studies have demonstrated this negative relationship between capital intensity and the effective tax rate. In this sense, we can mention the studies by Calvé et al. (2005), Chen et al. (2010), Derashid and Zhang (2003), Fernández (2004), Gupta and Newberry (1997), Molina (2005), Monterrey and Sánchez (2010), Richardson and Lanis (2007) and Stickney and McGee (1982).

However, there are other studies that find a direct relationship between capital intensity and the effective tax rate, such as those by Feeny et al. (2006), Janssen and Buijink (2000), Plesko (2003) and Wilkinson et al. (2001) as well as research studies that have not found clear evidence of the existence of a potential relationship between both variables, such as those by Fernández (2004) and Liu and Cao (2007).

Even though they are less numerous, we can mention other studies that have analysed the potential influence of inventory in the effective tax rates, generally arguing that investment in inventory, which is sometimes determined by characteristics of the sector of activity of the company, represents an alternative investment to fixed assets, which represents a restriction to the possibility of reducing the effective tax rate, so that one may consider the existence of a positive relationship between tax burden and inventory intensity. Research studies conducted by Fernández (2004), Gupta and Newberry (1997), Richardson and Lanis (2007) and Fernández and Martínez (2011) reached this conclusion.

In response to the results obtained most often in empirical research on the relationship between ETR and asset structure, the contrasting hypothesis is:

H<sub>2</sub>: Companies with a greater volume of assets bear a lower ETR with the possibilities of deducing depreciation allowances of said fixed assets from the Tax on Companies.

#### *Financial Structure and ETR*

The debt-to-equity ratio in corporate financing is a frequently used variable in these research studies, given the tax consequences of the financing decisions made by companies. In this case, the premise consists in assuming that the deductible nature of financial expenses on the tax on profits, against the non-deductible nature of dividends, will result in the existence of a negative relationship between debt levels and effective tax rates. This is the finding of the studies by Calvé et al. (2005), Fernández (2004), Liu and Cao (2007), Monterrey and Sánchez (2010), Plesko (2003), Richardson and Lanis (2007) and Sticney and McGee (1982), even though there has been no shortage of studies finding a positive relationship between debt levels and effective tax rates in companies bearing high levels of tax burden, which may represent a stimulus to obtain debt financing and reduce their effective tax rates. In this sense, we can mention Chen et al. (2010), Feeny et al. (2006) and Gupta and Newberry (1997).

We could even suggest the existence of a non-linear relationship between debt levels and tax burden, so that the type of relationship between these two variables would change after a certain proportion of debt (Fernández and Martínez, 2009 and 2011). According to this reasoning, which assumes a non-linear relationship between financing structure and ETR, we propose the following hypothesis:

H<sub>3</sub>: Companies with a lower proportion of equity bear a lower tax burden, given the greater role of debt in their financing structures, with the sign of this relationship changing after a certain threshold value for this proportion.

#### *Profitability and ETR*

In relation to this variable, the empirical evidence is conclusive, finding a positive relationship between profitability and tax burden almost unanimously. In our opinion, this is so mainly because of the advantages that companies with losses enjoy in terms of tax burden, as compensation of these losses, whether with past profits or future ones, directly results in a reduction of the tax burden they bear.

There are numerous studies that confirm this positive relationship between profitability and the effective tax rate, among which we can mention those by Calvé et al. (2005), Chen et al. (2010), Fernández (2004), Gupta and Newberry (1997), Plesko (2003), Richardson and Lanis (2007), Stickney and McGee (1982) and Wilkie and Limberg (1993). Consequently, our hypothesis is:

H<sub>4</sub>: Companies with greater profitability bear a greater tax burden.

#### *Type of organisation and ETR*

Following Jensen and Meckling (1976), the behaviour of companies may be conditioned by their legal form, as this defines their residual income and, consequently, it represents a factor that affects owners directly, leading to differences in corporate decisions and income obtained according to said legal form (Demsetz, 1983; Demsetz and Lehn, 1985).

In this sense, as we specified above, the study by Wu, Wang, Luo and Gillis (2012) found that privately-owned companies bear an effective tax rate higher than public-owned companies.

For their part, Fonseca et al. (2011) found empirical evidence about the effective tax rate borne by financial entities being conditioned by the type of company (bank or savings bank) so that the tax burden borne by banks is significantly higher than the one affecting savings banks.

The sector of activity of the company is a frequently used variable in these studies (Derashid and Zhang, 2003; Gupta and Newberry, 1992; Omer et al. (1993), Porcano, 1986; Zimmerman, 1983) since it may play a significant role, taking into account the tendency of legislators to establish differentiated tax treatments for certain sectors or for certain types of activities that may be more usual for some activities than for others (Molina, 2005, p. 108).

Thus, Derashid and Zhang (2003) conclude that the different tax benefits established by Malaysian authorities during the 1990s with the purpose of promoting the manufacturing and tourism sectors resulted in companies operating in these sectors finding themselves subject to a tax burden lower than that borne by companies in other branches of activity.

In the case of hotels and travel agencies, the legal form of both types of companies is the same. Furthermore, there are no different tax rates applicable to each of them nor are there specific deductions or tax credits for either. However, the fact that the size of hotels as well as their profitability and the weight that fixed assets represent in their total assets is greater leads us to consider the following hypothesis:

H<sub>5</sub>: The tax burden borne by hotels is greater than the one affecting travel agencies.

#### 4. Model specification and data source

The study uses panel data to analyse the importance of certain variables as firm size, financial structure, profitability and type of company (hotels or travel agencies) as determinants of the Effective Tax Rate borne by companies in the tourism sector.

The data are available from the SABI database where information about the balance sheets and the profit and loss accounts for 62 tourism firms over the 2008-2013 period has been obtained. For some companies the information was completed with their respective annual reports. SABI is a database created by the company Informa that has collected annual accounts from the most important Spanish and Portuguese companies since 1990. It is an interesting tool that helps with business analysis, comparisons between companies or company groups, rankings, concentration and segmentation analysis and sector studies.

According to the theoretical framework, the Effective Tax Rate will be a function of the Effective Tax Rate in the last period, Assets, Equity, Fixed Assets, company performance measured by ROA and time dummies to control for particular circumstances occurring during the sample period. The relationship to be analysed and which would allow us to test the hypothesis may be expressed as follows:

$$ETR_{it} = f(ETR_{it-1}, \log \text{asset}_{it}, \text{equity}_{it}, \text{FxAss}, \text{ROA}, \text{subsector}, \text{timedummies}) \quad (1)$$

The explanatory variables included to explain the Effective Tax Rate have been selected following the ETR literature review. The lagged variable ETR (ETR<sub>t-1</sub>) has been included to allow for the adjustments between the long-run and short-run in considering the effect of the Effective Tax Rate. The inclusion of the lagged dependent variable as an explanatory variable in the model avoids the problem of overestimation of the parameters caused by using the static model instead of the dynamic model.

Table 1 shows the main descriptive statistics for the variables included in the model as well as the sources of variation over firms and time (2008–2013). Standard deviations are calculated for the variables as well as within groups (WG) and between groups (BG). As expected, for most variables, the BG variation in the data is considerably larger than the WG variation. According to this source of variability, the model specification should retain that kind of variation between firms in the tourism sector.

**Table 1. Descriptive Statistics: variation sources over firms and correlation matrix, period 2008-2013**

Variable	Mean	Mediana	SD	SD(BG)	SD(WTH)
ETR	0.22	0.25	0.19	0.19	0.11
log asset	<b>6.33</b>	<b>6.18</b>	<b>2.16</b>	<b>0.75</b>	<b>2.06</b>
equity	<b>0.21</b>	<b>0.18</b>	<b>0.44</b>	<b>0.31</b>	<b>0.35</b>
FxAss	<b>0.62</b>	<b>0.71</b>	<b>0.31</b>	<b>0.18</b>	<b>0.27</b>
ROA	<b>0.036</b>	<b>0.001</b>	<b>0.22</b>	<b>0.20</b>	<b>0.11</b>

The regression specification in equation (1) is written for the Effective Tax Rate according to the following dynamic model:

$$ETR_{it} = \beta_0 + \beta_1 ETR_{it-1} + \beta_2 \log \text{asset}_{it} + \beta_3 \log \text{asset}_{it}^2 + \beta_4 \text{equity}_{it} + \beta_5 \text{equity}_{it}^2 + \beta_6 \text{FxAss}_{it} + \beta_7 \text{ROA}_{it} + \beta_8 d_{\text{hotel}} + \beta_9 d_{2007} + \dots + \beta_{11} d_{2011} + \mu_i + \varepsilon_{it} \quad (2)$$

The variable firm size has been included in the model measured by the logarithm of assets. The squared logarithm of assets has been also included in the model to capture any non linear relation between the ETR and firm size. The financial structure of a company has been measured by the ratio between capital and

equity and total assets. The squared variable included in the model allows us to detect any non-linear relation between the financial structure and ETR. The variable fixed assets defined as the ratio of fixed assets to total assets appears in the model as a proxy of capital intensity. The Return on Assets, ROA, could be considered as another determining factor for tax burden. ROA has been calculated by dividing the company's annual earnings before tax by its total assets. Dummy variables to control for differences in the two sub-sectors involved and for significant events that occurred in the period of study have been also included in the model.



Equation 2,  $V_{it} = \mu_i + \varepsilon_{it}$  contains the fixed effects decomposition of the error term, which  $\mu_i$  captures the unobserved specific effects for the type of tourist sub-sector (hotels and travel agencies) which are difficult to observe and measure. The error term  $\varepsilon_{it}$  is assumed to be serially uncorrelated and independently distributed with zero mean across different tourism sub-sectors.  $\varepsilon_{it}$  is also assumed to be uncorrelated with  $ETR_{it}$  and  $\mu_i$  for any time,  $t$ .

The inclusion of the lagged dependent variable causes some basic problems in the model estimation. Since  $ETR_{it}$  is a function of  $\mu_i$ , the regressor  $ETR_{it-1}$  is correlated with the error term. Therefore, the OLS estimator is biased and inconsistent although  $\varepsilon_{it}$  are not serially correlated. Furthermore, Fixed effects and GLS Random Effect estimators are biased and consistent for  $T \rightarrow \infty$  (although not for  $N \rightarrow \infty$ ) (Baltagi, 2008).

To cope with the problems above, the Arellano-Bond system Generalised Method of Moments (SYS-GMM) was used in this study. The Arellano-Bond estimator provides unbiased and consistent estimators in dynamic models since SYS-GMM eliminates the unobserved heterogeneity of the unit of analysis and the endogeneity of some variables appearing as regressors

in the model. Arellano-Bond estimator control for the potential endogeneity of the regressors by using the dependent variables lagged for two periods or more as valid instruments for the first difference in lagged dependent variables. Therefore, the instrumental variable method by Anderson and Hsiao (1982) and the Generalised methods of moments (one step, one step (robust) and two-step) estimator by Arellano and Bond (1991) has been used in the article. Since the asymptotic standard errors from the two-step estimator present a downward bias in the estimation of the standard errors (Blundell and Bond, 1998), one-step robust to heteroscedasticity estimators is used as it results in more reliable inference. The two-step estimator is provided to assess the validity of the model specification.

The final dynamic model to be estimated has been obtained by a stepwise regression where the potential explanatory variables will be included in the model according to their statistical significance to explain the Effective Tax Rate.

### 5. Results and discussions

The results from estimating equation (2) using Arellano-Bond (1991) one-step and two-step are displayed in Table 2.

**Table 2. Regression Results period 2008-2013**

Variable	Arellano-Bond one-step	Arellano-Bond one-step robust	Arellano-Bond two-step
ETR <sub>t-1</sub>	0.1681*** (0.0549)	0.1681*** (0.0498)	0.1634*** (0.0534)
log asset	0.0378*** (0.0084)	0.0378*** (0.0075)	0.0439*** (0.0081)
log asset <sup>2</sup>	-0.0021** (0.00084)	-0.0021*** (0.00065)	-0.00278*** (0.00078)
equity	-0.0503** (0.0243)	-0.0503** (0.0229)	-0.0491** (0.02256)
equity <sup>2</sup>	0.0919** (0.0246)	0.0919** (0.0234)	0.083** (0.0247)
FxAss	-0.011 (0.074)	-0.011 (0.0309)	-0.0093 (0.0324)
ROA	0.1314* (0.073)	0.1314** (0.0519)	0.1217 (0.0630)
Sector	0.0628** (0.0313)	0.0628*** (0.01950)	0.052** (0.0153)
AR(1)	-1.5886 (p=0.1143)	-1.5886 (p=0.1143)	-1.47274 (p=0.1034)
AR(2)	-1.2718 (p=0.2034)	-1.2718 (p=0.2034)	-1.378 (p=0.1680)
Sargan	15.3423 (p=0.2865)	15.3423 (p=0.2865)	10.3733 (p=0.6632)
Wald test	24.8189*** (p=0.0017)	24.8189*** (p=0.0017)	33.4704*** (p=0.0000)

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.001

The Arellano-Bond tests for autocorrelation of first order AR(1) and second order AR(2) show the non-existence of serial correlation in the residuals. The Sargan test (1958) for over-identifying restrictions shows that lagged dependent variables are valid instruments since they are uncorrelated with the residuals of the first differentiated equation.

The results from Table 2 obtained using the one-step and two-step estimators are very similar. As observed, the lagged dependent variable has a positive significant effect on the present Effective Tax Rate in all the models, suggesting temporal adjustments between the long-run and the short-run ETR. This fact evidences

the convenience of a dynamic model to study the hypotheses formulated. The variable size measured as the log of the assets is significant in all the estimated models, showing a curvilinear effect of that variable on ETR. The effect observed is that, up to a certain size, an increase in size generates increases in ETR, i.e., the hypothesis of political costs (Zimmerman, 1983) is met for that size range. However, once said threshold has been exceeded, the increase in size is the opposite, i.e., there is a decrease in the ETR borne. This result partially confirms hypothesis H<sub>1</sub>, also confirming the existence of a non-linear relationship between the variables of size and ETR, as observed by Fonseca et al. (2011).



We understand this finding to consist in that it seems logical to assume that exceeding a certain size, from which the company may be considered large, entails devoting more technical and human resources to tax planning, which results in a reduction in the tax burden borne. A curvilinear trend effect was also found between equity and tax burden. The positive coefficient for equity squared reveals that those companies with lower levels of equity bear lower levels of ETR.

These results are in line with the findings obtained by the majority of the literature reviewed and confirms hypothesis H<sub>3</sub>. However, the non-linear relationship observed shows that there is a small part of the value of the equity/total funds ratio where there is a negative relationship between the variables considered, i.e., an increase in that ratio implies a lower ETR borne. This finding was already documented by Fernández and Martínez (2009), thus demonstrating that the relationship between the two variables is not linear and can be altered after a certain percentage of equity.

Unlike other studies, our results show no relationship between fixed assets and the endogenous variable ETR. Therefore, hypothesis H<sub>2</sub> has not been confirmed, as observed in the empirical studies by Fernández (2004) and Liu and Cao (2007).

A positive linear relation has been found between ROA and ETR. This finding is in line with the prior research carried out, where almost all studies show this positive relationship between profitability and ETR. Therefore, hypothesis H<sub>4</sub> has been confirmed.

Differences on tax burden borne have been found by tourism sub-sectors, revealing higher ETR in hotels. Thus, hypothesis H<sub>5</sub> is confirmed. In our opinion, this finding is not due to differences existing in the legal forms of hotels and travel agencies nor to differences related to the public or private nature of their ownership nor to the existence of different management models. It is also not due to the existence of differentiated tax rates, deductions and tax credits. We understand that this result is a consequence of both the characteristics inherent to each sub-sector and the variables that have proven significant in this study. In other words, in our sample, hotels are of a larger size, have higher profitability and a financing structure with a lower debt ratio, so that it is logical for the final result to be a higher ETR for hotels than for travel agencies.

Time dummies were not found significant in manifesting not significant events occurring in the period of analysis affecting ETR.

## 6. Conclusions

This study represents the first approach to the study of determinants of the tax burden by two types of companies that are very relevant within the tourism sector, such as hotels and travel agencies.

The study uses panel data to analyse the importance of certain variables as firm size, financial structure, profitability, fixed assets and type of company (hotels or travel agencies) as determinants of the Effective Tax Rate over the 2008-2013 period for these Spanish companies. The Arellano-Bond system Generalised Method of moments (SYS-GMM) was used in this study. The Arellano-Bond estimator provides unbiased and consistent estimators in dynamic models since the inclusion of the lagged dependent variable as regressor biases the estimators obtained by the classic estimators as OLS and WG.

The findings obtained suggest that the ETR borne is determined by size, financing structure and type of entity. We deem the finding of the existence of non-linear relationships between ETR and size and financing structure relevant.

In this regard, taking into account the first hypothesis considered (H<sub>1</sub>), which established that companies with a size exceeding a certain threshold bear a lower tax burden given their greater capacity for tax planning, the relationship between ETR and size has been positive, confirming that an increase in size entails a higher ETR up to a certain volume of assets (hypothesis of political costs). However, once this size threshold has been exceeded, the relationship becomes negative, thus reflecting the greater effort that larger entities devote to tax planning.

In the case of financing structure, the hypothesis considered (H<sub>3</sub>) established that companies with a lower proportion of equity bear a lower tax burden, given the greater role of debt in their financing structure, with the sign of this relationship being the opposite one after a certain value in this proportion. The results have also allowed us to observe a non-linear relationship, through which there is an alteration of the sign of this relationship after a certain proportion of equity. We emphasise that the stretch of the value of the percentage of equity for which there is a negative relationship with ETR is small. In most companies in the sample, the positive relationship observed between equity and ETR is the one that has been mostly documented in literature. Therefore, we can affirm that, at least up to a certain level or threshold, companies with a greater volume of fixed assets bear a lower ETR before the possibilities of deduction from the Tax on Companies of the depreciation allowances for said fixed assets, as established in hypothesis H<sub>2</sub>.

A positive linear relation has been found between ROA and ETR, as affirmed in hypothesis H<sub>4</sub>. This finding is in line with the prior research carried out, where almost all studies show this positive relationship between profitability and ETR.

Differences on tax burden borne have been found by tourism sub-sectors, revealing higher ETR in hotels. Therefore, hypothesis H<sub>5</sub> is confirmed. We understand that this result is a consequence of the characteristics proper to each sub-sector, such as the variables that have proven significant in this study, specifically: greater size, greater profitability and lower role of debt in the financing structure for hotel companies.

This research can be extended by including other types of companies in the sector, such as restaurants. On the other hand, we also deem it interesting to perform comparative studies in different geographical areas, which would lead us to findings relative to the effect of the different tax policies implemented in different countries.

Furthermore, it could be relevant to include other potential factors determining ETR in this research, such as the public or private nature of the ownership of entities, the operating scheme of companies or the category of the establishment.

## References

- Adhikari, A., Derashid, C. & Zhang, H. (2006). Public policy, political connections, and effective tax rates: Longitudinal evidence from Malaysia. *Journal of Accounting and Public Policy*, 25, 574-595.
- Anderson, W., & C. Hsiao (1982). Formulation and Estimation of Dynamic Models using Panel Data. *Journal of Econometrics*, 18, 67-82.



- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58, 27-299.
- Baltagi, B. (2008). *Econometric Analysis of Panel Data*. Chichester, UK: Wiley.
- Blundell, A. & Bond, S. (1998). Initial Conditions and Moments Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, 87, 115-144.
- Buijink, W., Janssen, B. & Schols, Y. (2002). Evidence of the effect of domicile on corporate average effective tax rates in the European Union. *Journal of International Accounting, Auditing & Taxation*, 11 (2), 115-130.
- Calvé Pérez, J. L., Labatut Serer, G. & Molina Llopis, R. (2005). Variables económico-financieras que inciden sobre la presión fiscal Martínez y Álvarez, soportada por las empresas de reducida dimensión: efectos de la reforma fiscal de 1995 en las empresas de la Comunidad Valenciana. *Revista Española de Financiación y Contabilidad*, 127, 875-897.
- Chen, S., Chen, X., Cheng, T. & Shevlin, T.J. (2010). Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics*, 95, 41-61.
- Collins, J. H. & Shackelford, D. A. (1995). Corporate Domicile and Average Effective Tax Rates: The Cases of Canada, Japan, the United Kingdom and the United States. *International Tax and Public Finance*, 2, 55-83.
- Demsetz, M. (1983). The structure of ownership and the theory of the firm. *Journal of Law and Economics*, XXVI, 375-390.
- Demsetz, M. & Lehn, K. (1985). The structure of corporate ownership: causes and consequences. *Journal of Political Economy*, 93 (6), 1155-1177.
- Derashid, C. & Zhang, H. (2003). Effective tax rates and the "industrial policy" hypothesis: evidence from Malaysia. *Journal of International Accounting, Auditing & Taxation*, 12, 45-62.
- Devereux, M. P. & Griffith, R. (1998). Taxes and the Location of Production: Evidence from a Panel of US Multinationals. *Journal of Public Economics*, 68, 335-367.
- Feeny, S., Gillmann, M. & Harris, M.N. (2006). Econometric Accounting of the Australian Corporate Tax Rates: A Firm Panel Example. *Accounting Research Journal*, 19 (1), 64-73.
- Fernández Rodríguez, E. & Rubín Fernández, I. (2002). La medida de la presión fiscal en la Unión Europea a través de la información contable. Comunicación presentada al X Congreso de la Asociación Española de Profesores Universitarios de Contabilidad, Santiago de Compostela.
- Fernández Rodríguez, E. (2004). Los factores condicionantes de la presión fiscal empresarial española a partir de la información contable. Especial mención a las decisiones financieras. *Revista Española de Financiación y Contabilidad*, 120, 125-159.
- Fernández Rodríguez, E., Martínez Arias, A. & Álvarez García, S. (2004). El tipo impositivo contable y fiscal de las sociedades españolas a lo largo de la década de los noventa. *Partida Doble*, 153, 60-67.
- Fernández Rodríguez, E., Martínez Arias, A. & Álvarez García, S. (2008). La presión fiscal por Impuesto sobre Sociedades en la Unión Europea. *Documento de Trabajo*, Fundación de las Cajas de Ahorro, 407.
- Fernández Rodríguez, E. & Martínez Arias, A. (2009). Factores determinantes de la presión fiscal de las empresas cotizadas en Estados Unidos y la Unión Europea a partir de la información contable. *VII Workshop de Investigación Empírica en Contabilidad Financiera*, Cartagena.
- Fernández Rodríguez, E. & Martínez Arias, A. (2011). Determinants of Effective Tax Rate: Evidence for USA and the EU. *Intertax*, 39 (8/9), 381-395.
- Fonseca Díaz, A.R., Fernández Rodríguez, E. & Martínez Arias, A. (2011). Factores condicionantes de la presión fiscal de las entidades de crédito españolas, ¿existen diferencias entre bancos y cajas de ahorros? *Revista Española de Financiación y Contabilidad*, 151, 491-516.
- Garrido Pulido, T. & Garrido Pulido, R. (2006). The fiscal pressure in the cooperative agrarian societies of the second degree: repercussion of the law 3/2002, by that the law is modified 2/1999 gives cooperative andalusian societies. *Revesco*, 88, 62-98.
- Giannini, S. & Maggiulli, C. (2002). The effective tax rates in the EU Commission study on corporate taxation: Methodological aspects, main results and policy implications, *Center for Economic Studies & IFO Institute for Economic Research*, working paper 666.
- Graham, J. R. (1996). Debt and the marginal tax rate. *Journal of Financial Economics*, 41, 41-73.
- Gravelle, J. G. (1982). Effects of the 1981 Depreciation Revisions on the Taxation of Income from Business Capital. *National Tax Journal*, 35 (1), 1-20.
- Guenther, D. A. (1994). Earnings management in response to corporate tax rate changes: Evidence from the 1986 Tax Reform Act. *The Accounting Review*, 69 (1), 230-243.
- Gupta, S. & Newberry, K. (1992). Corporate Average Effective Tax Rates after the Tax Reform Act of 1986. *Tax Notes*, 55, 689-702.
- Gupta, S. & Newberry, K. (1997). Determinants of the Variability in Corporate Effective Tax Rates: Evidence from Longitudinal Data. *Journal of Accounting and Public Policy*, 16 (1), 1-34.
- Harris, M. & Feeny, S. (2003). Habit Persistence in Corporate Effective Tax Rates. *Applied Economics*, 35, 951-958.
- Heshmati, A., Johansson, D., & Bjuggren, C. M. (2010). Effective corporate tax rates and the size distribution of firms. *Journal of Industry, Competition and Trade*, 10, 297-317.
- Holland, K. (1998). Accounting policy choice: The relationship between corporate tax burdens and company size. *Journal of Business Finance and Accounting*, 25, 265-288.
- Hsieh, Y.-C. (2013). The heterogeneous relation between firm size and corporate effective tax rates: Evidence from listed companies in China. *Journal of Interdisciplinary Mathematics*, 16 (4-5), 297-308.
- Jacobs, O. H. & Spengel, C. (2000). Measurement and Development of the Effective Tax Burden of Companies. An Overview and International Comparison. *International Tax Review*, 28 (10), 334-351.
- Janssen, B. & Buijink, W. (2000). Determinants of the Variability of Corporate Effective Tax Rates (ETRs): Evidence for the Netherland. MARC Working Paper MARC-WP/3/2000-08. Disponible en <http://arno.unimaas.nl/show.cgi?fid=538> (consultado 24 de marzo de 2014).
- Jensen, M.C. & Meckling, N.H. (1976). Theory of the firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Kim, K. A. & Limpaphayom, P. (1998). Taxes and Firm Size in Pacific-Basin Emerging Economies. *Journal of International Accounting, Auditing & Taxation*, 7, 47-68.
- Kern, B. & Morris, M. (1992). Taxes and Firm Size: The Effects of Tax Legislation during the 1980s. *The Journal of the American Taxation Association*, 14 (1), 80-96.
- Liu, X. & Cao, S. (2007). Determinants of Corporate Effective Tax Rates. Evidence from Listed Companies in China. *The Chinese Economy*, 40 (6), 49-67.
- Manzon, G. B. & Smith, W. R. (1994). The Effect of the Economic Recovery Tax Act of 1981 and the Tax Reform Act of 1986 on the Distribution of Effective Tax Rates. *Journal of Accounting and Public Policy*, 13 (4), 349-362.
- Martínez Arias, A., Fernández Rodríguez, E. & Álvarez García, S. (2001). La incidencia de la reforma del Impuesto sobre Sociedades según el tamaño de la empresa. *Documentos*, Instituto de Estudios Fiscales, 23.
- Martínez Vargas, J. (2015). Del impuesto sobre beneficios devengado al pagado: una valoración del cálculo del tipo impositivo efectivo. *Revista de Contabilidad*, 18 (1), 68-77.
- McGuire, S. T., Omer, T. C. & Wang, D. (2012). Tax avoidance: does tax-specific industry expertise make a difference? *The Accounting Review*, 87 (3), 975-1003.

- Mills, L., Eickson, M.M. & Maydew, E. L. (1998). Investments in Tax Planning. *The Journal of the American Taxation Association*, 20 (1), 1-20.
- Molina Llopis, R. (2005). *Presión fiscal en las pymes. Estudio de su incidencia en la Comunidad Valenciana*. Monografías AECA. Asociación Española de Contabilidad y Administración de Empresas. Madrid.
- Molina Llopis, R. (2012). La presión fiscal en las cooperativas españolas durante el período 2003-2008. *CIRIEC-España, Revista de Economía Pública, Social y Cooperativa*, 74, 39-58.
- Molloy, K. H. (1998). An Approach for Comparing U.S. and Japanese Effective Corporate Tax Rates. *Journal of International Accounting, Auditing & Taxation*, 7 (1), 69-80.
- Monterrey Mayoral, J. & Sánchez Segura, A. (2010). Diferencias en agresividad fiscal entre empresas familiares y no familiares. *Revista Española de Financiación y Contabilidad*, 145, 65-98.
- Nicodème, G. (2001). Computing effective corporate tax rates: comparisons and results. European Commission. *Economic Paper ECFIN E2/358/01-EN*, 153.
- Omer, T. C., Molloy, K. & Ziebart, D. (1993). An Investigation of the Firm Size-Effective Tax Rate Relation in the 1980s. *Journal of Accounting, Auditing and Finance*, 8 (2), 167-182.
- Plesko, G. A. (2003). An evaluation of alternative measures of corporate tax rates. *Journal of Accounting and Economics*, 35, 201-226.
- Porcano, T. M. (1986). Corporate Tax Rates: Progressive, Proportional or Regressive. *The Journal of the American Taxation Association*, 7 (2), 17-31.
- Richardson, G. & Lanis, R. (2007). Determinants of the variability in corporate effective tax rates and tax reform: Evidence from Australia. *Journal of Accounting and Public Policy*, 26, 689-704.
- Sargan, J.D. (1958). The Estimation of Economic Relationships using Instrumental Variables. *Econometrica*, 26, 393-415.
- Shevlin, T. & Porter, S. (1992). The corporate tax comeback in 1987: some further evidence. *Journal of the American Taxation Association*, 14 (1), 58-79.
- Sholes, M. S. & Wolfson, M A. (1992). Firms' responses to anticipated reductions in tax rates: The Tax Reform Act of 1986. *Journal of Accounting Research*, 30 (3), 161-185.
- Stickney, C. P. & McGee, V. E. (1982). Effective Corporate Tax Rates. The Effect of Size, Capital Intensity, Leverage and Other Factors. *Journal of Accounting and Public Policy*, 1, 125-152.
- Tran, A. V. (1997). The gap between accounting profit and taxable income. *Australian Tax Forum*, 13 (4), 507-534.
- Tran, A.V. (1998). Causes of the book-tax income gap. *Australian Tax Forum*, 14 (3), 253-286.
- Wang, S. (1991). The Relation Between Firm Size and Effective Tax Rates: A Test of Firm Political Success. *Accounting Review*, 66 (1), 158-169.
- Wilkie, P. J., Limberg, S. (1990). The relationship between firm size and effective tax rate: A reconciliation of Zimmerman (1983) and Porcano (1986). *The Journal of the American Taxation Association*, 11, 76-91.
- Wilkie, P. J. & Limberg, S. (1993). Measuring Explicit Tax (Dis) Advantage for Corporate Tax Payers: An Alternative to Average Effective Tax Rates. *The Journal of the American Taxation Association*, 15 (1), 46-71.
- Wilkinson, B., Steven, C. & Geoff, J. (2001). Strategies and dividend imputation: the effect of foreign and domestic ownership on average effective tax rate. *Journal of International Accounting, Auditing & Taxation*, 10, 157-175.
- Wu, L., Wang, Y., Luo, W. & Gillis, P. (2012). State ownership, tax status and size effect of effective tax rate in China. *Accounting & Business Research*, 42 (2), 97-114.
- Zimmerman, J. L. (1983). Taxes and firm size. *Journal of Accounting and Economics*, 5 (2), 119-149.

**Received:** 21 July 2016

**Revisions required:** 01 February 2017

**Accepted:** 31 March 2017