

Tax Haven investments for Profit-Shifting: Evidence from Spanish Multinationals

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Abstract

Tax havens may play a key role in the Profit-Shifting (P-S) activity of Multinational Companies (MNCs), since, among other characteristics, they are the territories with the most beneficial taxes for foreign investors. This article shows that Spanish MNCs facing higher tax rates in non-tax havens, and therefore those that stand to gain the most from P-S, are more likely to invest in tax havens. This outcome is robust to at least two different tax haven lists and various definitions of the non-haven tax rate. The size of the MNCs' activity, their use of intangible assets, and belonging to the Ibex 35 stock index also positively affect the probability of investing in tax havens. By economic sectors, once the endogeneity problem is controlled for, the incentive is greater for manufacturing than for service firms, but it is especially high for financial firms. Additionally, while non-haven tax rates positively influence the number of different tax havens used by firms, they have no effect on the number of affiliates located within them. Finally, the article estimates that Spanish MNCs have been able to save about 4 billion euros per year in Corporate Income Tax in the period 2013-2018 as a result of P-S.

Keywords: Multinationals, Tax Haven investments, Profit-Shifting, Probability Model.

JEL Classification: F23, H25, H26, H87

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1. Introduction

Economic globalization and digitalization have increased the development of aggressive tax planning strategies by Multinational Companies (MNCs) (OECD, 2019; IMF, 2019). The present article focuses on Profit-Shifting (P-S), consisting of artificially shifting profits from affiliates in high-tax territories to affiliates in low-tax ones, within corporate groups. The literature on P-S is plentiful and there is consensus about the existence of the activity, but not its magnitude (for a review, see Dharmapala, 2014; Heckemeyer and Overesch, 2017; Dyreng and Hanlon, 2019; or Beer, De Mooij, and Liu., 2020).¹ In Castillo-Murciego and López-Laborda (2017), the authors found results consistent with P-S carried out by Spanish companies for the period 2005 to 2014.

Tax havens could play an important role in P-S: although there is no single definition for them, they are typically identified by their favourable tax conditions for foreign investors, and are usually small, well-governed territories (Dharmapala and Hines, 2009; Dharmapala, 2020). Although the above hypothesis seems very intuitive, it is important to provide evidence for it that reinforces the need for action to end aggressive tax planning activities and their negative effects on efficiency and equity.

In this line, Desai, Foley, and Hines (2006) and Gumpert, Hines, and Schnitzer (2016) found evidence consistent with tax haven investments for tax avoidance reasons for US and German firms, respectively. Such evidence was based on finding a positive relationship between MNCs' non-haven taxes and investments in tax havens: MNCs with higher non-haven taxes

¹ Regarding the magnitude of P-S, there are some papers that have recently taken advantage of the Country-by-Country reports to get more accurate estimates. See, for instance, Bratta, Santomartino, and Acciari (2021), Clausing, Saez, and Zucman (2020), Clausing (2020a and 2020b), Fuest, Hugger, and Neumeier (2021) and Fuest et al. (2022).

would have bigger tax-savings derived from P-S, and then would be more likely to invest in tax havens for P-S. Desai, Foley, and Hines (2006) found evidence regarding the largest tax havens.² Among German manufacturing firms, Gumpert, Hines, and Schnitzer (2016) found that a one-percentage-point higher foreign non-haven tax rate is associated with a 2.3% greater demand for a tax haven affiliate.

In this paper we also examine the relationship between non-haven taxes and investments in tax havens, but for a sample of Spanish MNCs, with the aim of increasing the empirical evidence about the establishment of tax haven affiliates to accomplish P-S. We also expect to find a positive effect of taxes on tax haven investments because Spain, like Germany, generally applies the exemption method for the correction of double taxation,³ which encourages P-S.

Particularly, we follow the Gumpert, Hines, and Schnitzer (2016) model to verify the raised research question. This model is extended with two additional variables: the ownership of intangible assets and the MNE's presence in the stock market Ibex 35 index, which could also be related to the use of tax havens; and is estimated for all economic sectors. Moreover, we conduct robustness tests consisting of defining alternative tax haven lists and average foreign

² Desai, Foley, and Hines (2006) obtained a negative effect of taxes on investment in the smaller tax havens. They took this contradictory result to mean that the smaller tax havens were being used by US MNCs to delay US taxation of lightly-taxed foreign income. This last result might be related to the international tax system applied by the US. Until the 2017 Tax Cuts and Jobs Act (TCJA), the US applied a worldwide tax system, which meant that companies had to pay the difference between domestic and foreign taxes when profits were repatriated. Only MNCs headquartered in countries applying a territorial tax system, like most OECD MNCs, can benefit from reduced foreign taxes at the end of the day.

³ Spain applies the exemption method for the correction of double international taxation with those territories that Spanish law does not consider to be tax havens and with which a Double Taxation Treaty is in force or which have a statutory Corporate Income Tax rate of 10% or more. Spain also applies the exemption method with Gibraltar. Additionally, we assume that there is a certain level of economic activity in the territories where the Spanish companies operate. Otherwise, according to the special regime of Controlled Foreign Corporations applied by Spanish Corporate Tax Law, profits are taxed in Spain directly, without any tax benefit from the P-S activity.

non-haven tax rates and changing the binary nature of the dependent variable by the number of tax havens and tax haven affiliates. This last analysis might also give a better understanding of the relationship of MNCs with tax havens. Finally, we additionally estimate the tax savings from P-S for MNCs with and without tax haven affiliates.

The rest of the article is structured as follows: section two presents the descriptive analysis of the data; section three explains the empirical methodology and presents the results; section four describes the robustness checks; section five estimates the tax savings for Spanish MNCs; and section six concludes.

2. Descriptive Analysis of Data

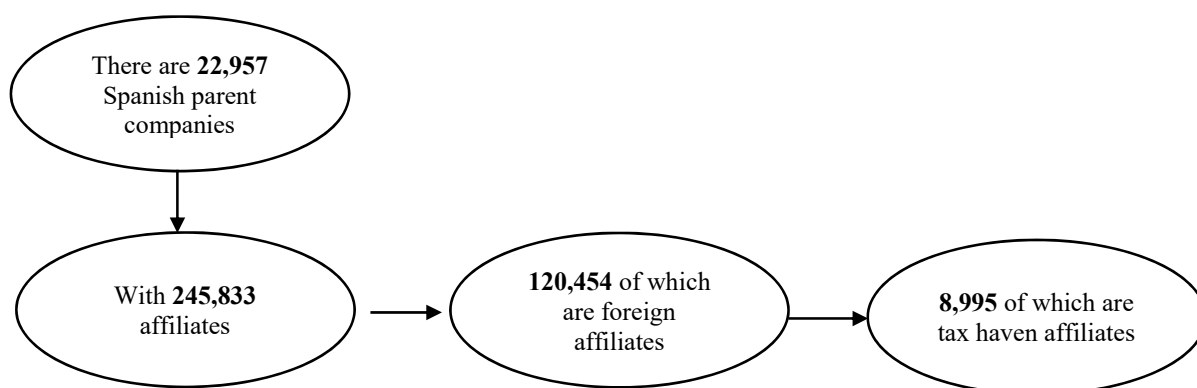
We use data on Spanish MNCs for the period 2013-2018, taken from the Bureau van Dijk's Sabi database, which contains firm-level accounting and ownership information on Spanish and Portuguese firms.

From an original list of 5,280 large and very large⁴ Spanish companies, taken for the year 2018, we first selected companies that are MNCs with at least one non-tax haven affiliate in any year of the sample. Following the empirical literature, a company with a minimum degree of participation of 10% in at least one foreign affiliate is considered to be a MNC. Then, for a particular year in the period 2013-2018, only companies continuing to meet both requirements –being a MNC and having a non-tax haven affiliate – were maintained. The result is a data pool of 4,809 Spanish companies, most of which are included in the sample in more than one year.

⁴ According to the Bureau van Dijk, very large companies are those with turnover higher than €100 million, total assets higher than €200 million or number of employees higher than 1,000; and large companies are those with turnover higher than €10 million, total assets higher than €20 million or number of employees higher than 150.

The tax haven list taken as reference is that of the seminal paper of Hines and Rice (1994) but extended by Tørsløv, Wier, and Zucman (2022) to include Belgium and the Netherlands (hereafter, “the extended Hines and Rice list”). The total number of Spanish companies’ observations for 2013-2018 is shown in Figure 1. As can be seen, around 50% of total affiliates are foreign affiliates, of which around 7.50% are tax haven affiliates.

Figure 1. Total Number of Spanish Companies’ observations for 2013-2018



Source: By the authors.

Additionally, Table 1 shows that a reduced percentage of Spanish MNCs had a tax haven affiliate for the period 2013-2018 and that it varies by economic sector. This percentage is slightly less than the 20.40% found for German firms between 2002 and 2008⁵ (Gumpert, Hines, and Schnitzer, 2016) and would reflect that Profit-Shifting (P-S) is not a cost-free activity for companies.

⁵ German MNCs are firms who hold shares or voting rights of 10% or more in a company with a balance sheet total of more than €3 million. The percentage of German companies that have any tax haven affiliate is 82% for large MNCs subject to Country-by-Country reporting in 2016 and 2017 (Fuest, Hugger, and Neumeier, 2021).

Table 1. Total Number of Spanish Parent Companies' observations by Sector for 2013-2018 and their use of Tax Havens

	All Firms	Manufact.	Service	Financial	Other
Total number of parent years	22,957	6,703	10,674	2,951	2,625
Of which, with Tax Haven affiliate	3,575 (15.57%)	772 (11.52%)	1,567 (14.68%)	816 (27.65%)	420 (16.00%)
Of which, with more than one Tax Haven affiliate (same or different country)	1,417 (39.63%)	216 (27.98%)	631 (40.27%)	400 (49.02%)	170 (40.48%)
Of which, with more than one Tax Haven affiliate (different country)	1,021 (28.55%)	165 (21.37%)	462 (29.48%)	280 (34.31%)	114 (27.14%)

Source: By the authors.

Moreover, in more than 60% of cases, Spanish companies with at least one tax haven affiliate have only one, and when they have more than one, it is more common for them to operate in the same rather than in different tax havens (Table 1). Again, there are differences across economic sectors. In addition to being the sector with the highest percentage of MNCs operating in tax havens, the financial sector has the highest percentage of companies owning more than one tax haven affiliate, whether in the same or a different country.

Table 2 shows the distribution of Spanish companies' operations across the main tax havens, measured by the number of foreign affiliates and the number of Spanish parent companies operating within their borders. Furthermore, it shows some features of such tax havens: their Corporate Income Tax rate, the existence or not of a Double Taxation Treaty with Spain, the territorial or worldwide tax system applied by Spain with them, their GDP, and their membership of the OECD and the EU.

Table 2. Main Tax Havens: Average 2013-2018

	Share by number of affiliates (%) ^a	Share by number of parents (%) ^a	CIT rate (%) ^b	DTT ^c	ITS ^d	GDP ^e	OECD	EU
Netherlands (the)	28.52	21.54	25.00	1	Territorial	885.28	1	1
Panama	14.28	15.15	25.00	1	Territorial	43.81	0	0
Belgium	10.47	11.33	33.16	1	Territorial	512.35	1	1
Switzerland	8.87	10.09	17.92	1	Territorial	637.52	1	0
Ireland	8.69	7.06	12.50	1	Territorial	310.94	1	1
Luxembourg	6.67	7.38	28.33	1	Territorial	62.01	1	1
Hong Kong	5.81	6.62	16.50	1	Territorial	269.14	0	0
Singapore	4.18	5.06	17.00	1	Territorial	296.92	0	0
Andorra	2.93	4.20	10.00	1	Territorial	NA	0	0
Cyprus	1.71	2.35	12.50	1	Territorial	11.48	0	1
Malta	1.61	1.58	35	1	Territorial	24.26	0	1
Cayman Islands (the)	1.15	1.02	0.00	0	Worldwide	NA	0	0

Source: By the authors. (a) The percentage is calculated with regard to the completed list of tax havens. (b) statutory Corporate Income Tax Rate (source: <https://home.kpmg/it/it/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html>). (c) Existence (1) or otherwise (0) of a Double Taxation Treaty between the corresponding tax haven and Spain (source: Tax Agency and the Ministry of Finance and Public Function). The DTT between Andorra and Spain exists from 2015 on and the one between Cyprus and Spain from 2014. (d) International Tax System applied by Spain (source: Spanish Corporate Income Tax law and bilateral DTT). Spain has applied the Territorial system with Hong Kong since 01-04-2013, when Hong Kong ceased to be considered a tax haven for Spain. (e) Source: Tax Foundation.

Table A1 in the Annex compares descriptive statistics for Spanish MNCs with and without tax haven operations. It shows that companies with tax haven affiliates are larger in terms of specific financial variables than those without them, operate overseas to a greater extent and a large share of them operates in the financial sector. Moreover, although they face higher foreign tax rates, they pay a lower tax, which is in line with the P-S activity.

3. Empirical Methodology and Results

The empirical analysis is based on the theoretical model developed by Gumpert, Hines, and Schnitzer (2016) to evaluate tax haven investments for P-S. This model assumes that companies can artificially reallocate part of their actual profits earned in a high tax jurisdiction to a low tax one, especially a tax haven. As a result, reported profits in a tax haven are the sum of real profits plus shifted profits. However, Profit-Shifting (P-S) may not benefit all firms. In addition to the cost of establishing an affiliate in the tax haven, there are, for instance, expenses related to the particular P-S strategy, mainly transfer pricing or thin-

capitalization.

Gumpert, Hines, and Schnitzer (2016) predicted that the higher the foreign tax rate in jurisdictions other than tax havens in which the MNC operates, the higher the tax saving derived from P-S and hence, the higher the likelihood of setting up a tax haven affiliate. Also, profitable firms are better able to cope with the marginal and fixed setup costs related to P-S.

Based on the predictions of the theoretical model, the estimated model is the following:

$$y_{jt} = \beta_0 + \beta_1 \tau_{jt} + \beta_2 p_{jt} + \beta_3 p_{jt}^2 + \beta_4 nh_{jt} + \beta_5 nh_{jt}^2 + \beta_6 intang_{jt} + \beta_7 ibex_{jt} + \alpha_p + \gamma_t + u_{jt} \quad (1)$$

The dependent variable (y_{jt}) is a dummy variable that is equal to 1 if a Spanish MNC j holds at least one affiliate in at least one tax haven in year t , and the value 0 otherwise. The main independent variable is the average tax rate borne by MNC j in year t (τ_{jt}) in non-tax haven territories. It is calculated by the average of the statutory Corporate Income Tax (CIT) rate a MNC faces at its foreign non-tax haven locations, weighted by the number of affiliates within the corresponding territories, as a proxy of real profits of firms.⁶ A positive effect of the tax rate on the probability of investing in at least one tax haven is interpreted as an indicator of tax haven investment for P-S.

The following variables control for corporate profitability: the natural logarithm of the number of employees of the parent firm⁷ (p_{jt}) and the same squared (p_{jt}^2), and the natural logarithm of the number of employees of the foreign non-haven affiliates (nh_{jt}) and the same

⁶ Gumpert, Hines, and Schnitzer (2016) took the number of employees as a proxy for the real profits of the individual affiliate (adjusted by the participation of the parent in the affiliate). Instead, we weight the tax rate of each country by the number of affiliates within it, because there are a lot of missing data in the Sabi database for financial variables.

⁷ It is assumed that missing data are randomly distributed among companies.

squared (nh_{jt}^2).

We add to the model the logarithm of the intangible fixed assets of the parent company ($intang_{jt}$) and the dummy variable $ibex_{jt}$, which takes the value of one for companies belonging to the Ibox 35 index.⁸ This last variable is included because of the relevance of the companies in this group. Intangible assets might make the P-S activity easier for MNCs, due to the lack of transparency in the transfer pricing process (Dischinger and Riedel, 2011). Lastly, year fixed effects (γ_t) and industry fixed effects (α_ρ) are included.

Following Gumpert, Hines, and Schnitzer (2016), we first estimate the model by Ordinary Least Squares, generating a Pooled Linear Probability Model (PLPM). Next, we consider that a possible endogeneity problem stemming from simultaneity might exist between the dependent variable and the average tax rate. A MNC might set up an affiliate in a high tax territory only once it has an affiliate in a tax haven to which profits can be diverted. In this scenario, not only would high tax rates have influenced investments in tax havens to subsequently carry out P-S, but also investments in tax havens to where profits might be diverted would have influenced investments in non-havens, and hence the foreign non-haven average tax rate. The possible endogeneity problem is addressed with an instrumental variable approach, producing a Pooled Linear Instrumental Variable Model (PLIVM).⁹

The average tax rate of MNCs is instrumented by using ownership data from the first year

⁸ We took the companies belonging to the Ibox 35 index from 2013 to 2018, most of which are active in the service and the financial sectors.

⁹ Different from Gumpert, Hines, and Schnitzer (2016), we ruled out the estimation of firm fixed-effect models due to the pooled structure of our data, which an increasing number of companies over time; and the limited number of firms changing their status of having a tax haven affiliate or not, which reduces the estimates to 8.38% of the sampled firms when applying firm fixed-effects. However, we consider that all important factors affecting the opportunity of firms to accomplish P-S are controlled for by the model variables and the industry dummies. Logit and Probit models were also estimated, and the sign and statistical significance for all the model variables remain very similar to those presented in the following section.

for which information is available for a firm for all the following years in the sample. For instance, if there is available information starting from 2015 for a MNC, the average tax rate for that MNC is calculated from 2016 on by using the ownership data of 2015 and the corporate tax rates of the corresponding year.¹⁰ For this reduced sample there are 4,405 Spanish companies, instead of 4,809 (for the general sample). And the total number of parent observations is 19,590, instead of 22,957. It should also be noted that for this instrument of the average tax rate, the weighting factor, i.e., the number of affiliates, is fixed over the years. The software used for estimates is STATA and results are shown below, first for the full sample and second by economic sectors. The descriptive statistics of the model variables for the general sample are in Table A2 in the Annex.

3.1. Results for the Full Sample

Columns (1) and (2) of Table 3 show the estimates for the PLPM without and with industry dummies, respectively. And columns (3) and (4) show the estimates for the PLIVM, from the reduced sample.

¹⁰ Then, for every MNC, one year is lost from the sample, so that the sample is limited to the period 2014-2018. Moreover, those MNCs with available information from 2018 on are eliminated from the sample.

Table 3. Pooled Linear Probability Model and Pooled Linear IV Model

	(1) OLS	(2) OLS	(3) 2SLS	(4) 2SLS
τ_{jt}	0.5682*** (0.0714)	0.6129*** (0.0711)	0.6267*** (0.0938)	0.6809*** (0.0924)
ps_{jt}	-0.0471*** (0.0095)	-0.0084 (0.0097)	-0.0485*** (0.0103)	-0.0090 (0.0106)
ps_{jt}^2	0.0049*** (0.0009)	0.0023** (0.0010)	0.0047*** (0.0010)	0.0021** (0.0010)
$nths_{jt}$	-0.0024 (0.0053)	-0.0008 (0.0052)	-0.0042 (0.0059)	-0.0028 (0.0057)
$nths_{jt}^2$	0.0063*** (0.0007)	0.0054*** (0.0006)	0.0067*** (0.0007)	0.0058*** (0.0007)
$intang_{jt}$	0.0200*** (0.0014)	0.0191*** (0.0014)	0.0198*** (0.0015)	0.0190*** (0.0015)
$ibex_{jt}$	0.2089*** (0.0391)	0.1491*** (0.0364)	0.2080*** (0.0426)	0.1425*** (0.0396)
N	9,300	9,298	7,953	7,952
R ²	0.1643	0.1896	0.1664	0.1937
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	No	Yes	No	Yes
Instrument	No	No	Yes	Yes
F-statistics	-	-	5,317.84***	5,238.7***

Source: By the authors. The dependent variable is a dummy variable that is equal to 1 if a Spanish MNC j holds at least one affiliate in at least one tax haven in year t , and the value 0 otherwise. The main explanatory variable is the average tax rate borne by MNC j in year t in non-tax haven territories (τ_{jt}). The control variables are: the natural logarithm of the number of employees of the parent firm (p_{jt}) and the same squared (p_{jt}^2); the natural logarithm of the number of employees of the foreign non-haven affiliates (nh_{jt}) and the same squared (nh_{jt}^2); the logarithm of the intangible fixed assets of the parent company ($intang_{jt}$) and the dummy variable $ibex_{jt}$. ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in parentheses.

Our main independent variable in the model confirms that an increase in the foreign non-haven tax rate of Spanish MNCs is associated with a higher probability of owning a tax haven affiliate, which is in line with investments for P-S (Table 3). Moreover, this result is similar for all specifications, and this is because according to the Wooldridge endogeneity test, the null hypothesis of exogeneity of the tax rates cannot be rejected.¹¹

According to the PLPM with industry fixed effects (column 2), an increase in the tax rate of the non-tax haven affiliates of a MNC is associated with a 0.61% greater likelihood of this

¹¹ Thus, it seems that the tax rate variable is exogenous and does not need to be instrumented. Nevertheless, when instrumented, the F statistic is significant, which means that the instrument is valid.

company owning a tax haven affiliate. Since around 15.57% of Spanish companies in the sample have tax haven affiliates, this translates into a 3.9% ($0.6129 / 0.1557$) greater demand for a tax haven affiliate, higher than the 2.3% obtained by Gumpert, Hines, and Schnitzer (2016).

Also, profitability, the use of intangible assets, and belonging to the Ibex 35 index boost the probability of MNCs investing in tax havens, all this being consistent with P-S.

3.2. Results by Economic Sectors

Table 4 shows the results for the PLPM by economic sector. On the one hand, there is a particularly high positive effect of the tax rate on the probability of setting up a tax haven affiliate for the financial sector, which matches with the higher number of companies with tax haven affiliates in that sector compared to the other sectors. The large presence of banks in tax havens came to light with the recent tax scandals (Bouvatier, Capelle, and Delatte, 2017; Fatica and Gregori, 2020). Moreover, recent information on Country-by-Country reports seems to show that some tax havens have maintained high shares of bank profits that are not geographically aligned with their activities (Janský, 2020).

On the other hand, it is noticeable that the effect of the Ibex 35 variable comes entirely from financial firms, too. This outcome may be related to the fact that financial firms account for a large share of the Ibex-35 companies. Inversely, intangible fixed assets only have a positive effect on the three other sectors, which may be associated with a minor volume of intangible assets by financial firms in comparison to firms in other economic sectors.

Table 4. Pooled Linear Probability Model: Economic Sectors

	(1) Manufacturing ^a	(2) Service ^b	(3) Financial ^c	(4) Other ^d
τ_{jt}	0.4778*** (0.0992)	0.5329*** (0.1099)	1.6930*** (0.4217)	0.2681 (0.2593)
ps_{jt}	0.0204 (0.0343)	-0.0115 (0.0119)	0.0375 (0.0331)	0.0040 (0.0211)
ps_{jt}^2	0.0012 (0.0033)	0.0014 (0.0012)	-0.0017 (0.0046)	0.0026 (0.0022)
$nths_{jt}$	0.0073 (0.0093)	-0.0206*** (0.0075)	0.0474** (0.0235)	0.0386*** (0.0139)
$nths_{jt}^2$	0.0016 (0.0013)	0.0093*** (0.0010)	-0.0000 (0.0022)	0.0043*** (0.0016)
$intang_{jt}$	0.0236*** (0.0024)	0.0191*** (0.0020)	0.0094 (0.0070)	0.0097** (0.0042)
$ibex_{jt}$	0.1196 (0.1812)	0.0561 (0.0542)	0.2676*** (0.0637)	0.0669 (0.1043)
N	3,477	4,253	661	907
R ²	0.1054	0.1725	0.1796	0.3196
Year dummies	Yes	Yes	Yes	Yes
Instrument	No	No	No	No

Source: By the authors. The dependent variable is a dummy variable that is equal to 1 if a Spanish MNC j holds at least one affiliate in at least one tax haven in year t , and the value 0 otherwise. The main explanatory variable is the average tax rate borne by MNC j in year t in non-tax haven territories (τ_{jt}). The control variables are: the natural logarithm of the number of employees of the parent firm (p_{jt}) and the same squared (p_{jt}^2); the natural logarithm of the number of employees of the foreign non-haven affiliates (nh_{jt}) and the same squared (nh_{jt}^2); the logarithm of the intangible fixed assets of the parent company ($intang_{jt}$) and the dummy variable $ibex_{jt}$. (a) Nace Rev2 C: 1000-3400; (b) Nace Rev2 G-J y L-S: 4500-6399 y 6701-9610; (c) Nace Rev2 K: 6400-6700; (d) Nace Rev2 A-B, D-F y T-U. ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in parentheses.

The effect of the tax rate on the probability of investing in a tax haven is also positive for the manufacturing and service sectors, but considerably lower than for the financial sector. Comparing the first two, the effect is higher for the manufacturing than for the service sector once the possible endogeneity problem is controlled for and the instrument is valid (Table 5). This may be “consistent with service firms facing high marginal costs of income reallocation and relatively little variability in these costs” (Gumpert, Hines, and Schnitzer, 2016, p. 727).

Table 5. Pooled Linear Instrumental Variable Model: Economic Sectors

	(1) Manufacturing ^a	(2) Service ^b	(3) Financial ^c	(4) Other ^d
τ_{jt}	0.6260*** (0.1149)	0.4168*** (0.1452)	2.3693*** (0.6359)	0.7741** (0.3785)
ps_{jt}	0.0133 (0.0378)	-0.0118 (0.0131)	0.0412 (0.0367)	0.0062 (0.0227)
ps_{jt}^2	0.0014 (0.0036)	0.0011 (0.0013)	-0.0021 (0.0051)	0.0022 (0.0024)
$nths_{jt}$	0.0057 (0.0100)	-0.0225*** (0.0082)	0.0326 (0.0258)	0.0378** (0.0161)
$nths_{jt}^2$	0.0020 (0.0014)	0.0098*** (0.0011)	0.0009 (0.0024)	0.0042** (0.0018)
$intang_{jt}$	0.0238*** (0.0027)	0.0183*** (0.0021)	0.0089 (0.0076)	0.0101** (0.0045)
$ibex_{jt}$	0.1751 (0.1896)	0.0486 (0.0583)	0.2528*** (0.0718)	0.1012 (0.1186)
N	2,968	3,678	553	753
R ²	0.1040	0.1719	0.1759	0.3176
Year dummies	Yes	Yes	Yes	Yes
Instrument	Yes	Yes	Yes	Yes
F-statistics	2,908.08***	1,896.73***	380.553***	381.882***

Source: By the authors. The dependent variable is a dummy variable that is equal to 1 if a Spanish MNC j holds at least one affiliate in at least one tax haven in year t , and the value 0 otherwise. The main explanatory variable is the average tax rate borne by MNC j in year t in non-tax haven territories (τ_{jt}). The control variables are: the natural logarithm of the number of employees of the parent firm (p_{jt}) and the same squared (p_{jt}^2); the natural logarithm of the number of employees of the foreign non-haven affiliates (nh_{jt}) and the same squared (nh_{jt}^2); the logarithm of the intangible fixed assets of the parent company ($intang_{jt}$) and the dummy variable $ibex_{jt}$. (a) Nace Rev2 C: 1000-3400; (b) Nace Rev2 G-J y L-S: 4500-6399 y 6701-9610; (c) Nace Rev2 K: 6400-6700; (d) Nace Rev2 A-B, D-F y T-U. ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in parentheses.

4. Robustness Checks

In this section we run three robustness checks. The first one consists of replicating the estimates by using two alternative tax haven lists: the original Hines and Rice list and the Spanish list, which has evolved over time. The second uses alternative definitions of the main independent variable, the average tax rate. And the third changes the binary nature of the dependent variable for two alternative definitions of it.

4.1. Alternative Tax Haven Lists

From the Hines and Rice (1994) original tax haven list, there are 4,897 Spanish MNCs with at least one non-tax haven affiliate. From the list established by Spanish legislation,

summarized in Table 6, there are 5,012. Moreover, 11.64% of Spanish companies have at least one tax haven affiliate from the Hines and Rice original tax haven list and only 1.63% from the Spanish list.

Table 6. Spanish List of Tax Havens, 2013-2018

Anguilla, Antigua and Barbuda, Bahrain, Bermuda, Brunei Darussalam, Cook Islands (the), Cayman Islands (the), Cyprus (2013-2014), Dominica, Fiji, Falkland Islands (the) [Malvinas], Guernsey, Gibraltar, Grenada, Guam, Hong Kong (2013), Isle of Man, Jersey, Jordan, Lebanon, Liberia, Saint Lucia, Liechtenstein, Macao, Monaco, Northern Mariana Islands (the), Montserrat, Mauritius, Nauru, Oman (2013-2015), Solomon Islands, Seychelles, Turks and Caicos Islands (the), Saint Vincent and the Grenadines, Virgin Islands (British), Virgin Islands (U.S.), Vanuatu
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Source: By the authors. Some territories were included for only a few years of the period in the Spanish tax haven list (in parentheses).

Table 7 replicates our preferred estimates, those of Table 3 for the PLPM, using these alternative tax haven lists. Columns (1) and (2) show the results for the Hines and Rice (1994) original tax haven list; and columns (3) and (4) for the Spanish list.

Table 7. Pooled Linear Probability Model: Alternative Tax Haven Lists

	(1) Original HR list	(2) Original HR list	(3) Spanish list	(4) Spanish list
τ_{jt}	0.4052*** (0.0602)	0.4637*** (0.0601)	-0.0280 (0.0240)	-0.0206 (0.0239)
ps_{jt}	-0.0537*** (0.0085)	-0.0186** (0.0088)	-0.0066** (0.0032)	-0.0006 (0.0035)
ps_{jt}^2	0.0057*** (0.0008)	0.0032*** (0.0009)	0.0010** (0.0004)	0.0006 (0.0004)
$nths_{jt}$	-0.0134 *** (0.0048)	-0.0105** (0.0048)	-0.0144*** (0.0026)	-0.0136*** (0.0027)
$nths_{jt}^2$	0.0066*** (0.0006)	0.0058*** (0.0006)	0.0028*** (0.0028)	0.0026*** (0.0004)
$intang_{jt}$	0.0110*** (0.0013)	0.0105*** (0.0013)	0.0021*** (0.0005)	0.0021*** (0.0005)
$ibex_{jt}$	0.2412*** (0.0410)	0.1912*** (0.0415)	0.3334*** (0.0444)	0.3238*** (0.0448)
N	9,562	9,560	9,724	9,722
R ²	0.1405	0.1646	0.1291	0.1350
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	No	Yes	No	Yes
Instrument	No	No	No	No

Source: By the authors. The dependent variable is a dummy variable that is equal to 1 if a Spanish MNC j holds at least one affiliate in at least one tax haven in year t , and the value 0 otherwise. The main explanatory variable is the average tax rate borne by MNC j in year t in non-tax haven territories (τ_{jt}). The control variables are: the natural logarithm of the number of employees of the parent firm (p_{jt}) and the same squared (p_{jt}^2); the natural logarithm of the number of employees of the foreign non-haven affiliates (nh_{jt}) and the same squared (nh_{jt}^2); the logarithm of the intangible fixed assets of the parent company ($intang_{jt}$) and the dummy variable $ibex_{jt}$. ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in parentheses.

As can be seen in Table 7, the effect of the tax rate on the probability of setting up a tax haven affiliate is also positive for the original Hines and Rice tax haven list. Moreover, the magnitude of the result is very similar to that obtained for the extended Hines and Rice list. In contrast, the coefficient of the tax rate variable is not statistically significant for the Spanish list. This is consistent with the fact that Spain applies the tax credit method with the territories of its own tax haven list, which ultimately eliminates the Profit-Shifting (P-S) incentive. This result may be indicative that the official lists of tax havens, with the measures associated with them, are effective, but also that such lists should be as comprehensive as possible.

4.2. Alternative Average Tax Rates

Table 8 contains different definitions of the main independent variable that are used alternatively as a proxy for the average tax rate.

Table 8. Alternative Average Tax Rate: Definitions

$\tau_{jt}(i)$	MNC average foreign non-haven tax, unweighted
$\tau_{jt}(ii)$	MNC average foreign non-haven tax, weighted by the number of affiliates and adjusted by the participation of the parent in the affiliate
$\tau_{jt}(iii)$	MNC average foreign non-haven tax, weighted by the GDP
$\tau_{jt}(iv)$	MNC average foreign non-haven tax, weighted by the number of affiliates and the GDP
$\tau_{jt}(v)$	MNC average foreign non-haven tax, weighted by the number of affiliates and the GDP and adjusted by the participation of the parent in the affiliate

Source: By the authors.

Table 9 replicates the estimates of Table 3 for the PLPM with industry dummies using the alternative definitions of the average tax rate. As can be seen, the effect of the tax rate on the likelihood of completing tax haven investments is positive for all alternative definitions, but increases somewhat when the GDP is used as a weighting factor.

Table 9. Pooled Linear Probability Model: Alternative Average Tax Rate

	(1) τ_{jt} (i)	(2) τ_{jt} (ii)	(3) τ_{jt} (iii)	(4) τ_{jt} (iv)	(5) τ_{jt} (v)
Average tax rate	0.5451*** (0.0715)	0.6155*** (0.0717)	0.8748*** (0.0638)	0.9213*** (0.0642)	0.8758*** (0.0645)
ps_{jt}	-0.0083 (0.0097)	-0.0111 (0.0098)	-0.0077 (0.0096)	-0.0080 (0.0096)	-0.0106 (0.0098)
ps_{jt}^2	0.0023** (0.0010)	0.0027*** (0.0010)	0.0023** (0.0009)	0.0023** (0.0009)	0.0026*** (0.0010)
$nths_{jt}$	-0.0010 (0.0052)	0.0003 (0.0053)	-0.0035 (0.0052)	-0.0034 (0.0052)	-0.0019 (0.0052)
$nths_{jt}^2$	0.0055*** (0.0006)	0.0053*** (0.0006)	0.0055*** (0.0006)	0.0055*** (0.0006)	0.0053*** (0.0006)
$intang_{jt}$	0.0193*** (0.0014)	0.0190*** (0.0014)	0.0180*** (0.0014)	0.0179*** (0.0014)	0.0180*** (0.0014)
$ibex_{jt}$	0.1516*** (0.0364)	0.1540*** (0.0367)	0.1519*** (0.0362)	0.1439*** (0.0361)	0.1484*** (0.0370)
N	9,298	9,149	9,298	9,298	9,149
R²	0.1885	0.1888	0.1985	0.1999	0.1976
Year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Instrument	No	No	No	No	No

Source: By the authors. The dependent variable is a dummy variable that is equal to 1 if a Spanish MNC j holds at least one affiliate in at least one tax haven in year t , and the value 0 otherwise. The main explanatory variable is the average tax rate borne by MNC j in year t in non-tax haven territories (τ_{jt}). The definition of each of the alternative average tax rates is in Table 8. The control variables are: the natural logarithm of the number of employees of the parent firm (p_{jt}) and the same squared (p_{jt}^2); the natural logarithm of the number of employees of the foreign non-haven affiliates (nh_{jt}) and the same squared (nh_{jt}^2); the logarithm of the intangible fixed assets of the parent company ($intang_{jt}$) and the dummy variable $ibex_{jt}$. ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in parentheses.

4.3. Number of Tax Havens and Tax Haven Affiliates

This section evaluates whether higher tax rates stimulate not only the ownership of subsidiaries in tax havens, but also the number of tax havens where a MNC is established, or the number of subsidiaries incorporated by each company in tax havens. Table 10 estimates the model defined in equation (1), changing the dependent binary variable to a variable quantifying the number of tax havens used by Spanish companies (columns 1 and 2) and the number of tax haven affiliates (columns 3 and 4).

According to Table 10, it seems that while higher taxes boost the number of different tax havens used by Spanish parent firms, they have no effect or even discourage the number of

total tax haven affiliates of MNCs. On the one hand, the result of columns (1) and (2) might mean that P-S is easier if Spanish MNCs diversify the location of their subsidiaries in tax havens. On the other hand, the results of columns (3) and (4) could mean that the number of affiliates located in each tax haven is not relevant for P-S. Additionally, these last results might suggest that lower foreign non-haven taxes could foster tax haven investments for reasons other than P-S (column 3).

Table 10. Pooled Model: Alternative Dependent Variables

	(1) Number of Tax Havens	(2) Number of Tax Havens	(3) Number of TH affiliates	(4) Number of TH affiliates
τ_{jt}	0.1706 (0.1268)	0.2769** (0.1262)	-0.6997* (0.3757)	-0.3460 (0.3785)
ps_{jt}	-0.1201*** (0.0249)	-0.0684*** (0.0249)	-0.0178 (0.0897)	0.0211 (0.0854)
ps_{jt}^2	0.0116*** (0.0028)	0.0077*** (0.0028)	-0.0043 (0.0117)	-0.0101 (0.0116)
$nths_{jt}$	-0.1423*** (0.0209)	-0.1389*** (0.0207)	-0.7380*** (0.1334)	-0.7252*** (0.1303)
$nths_{jt}^2$	0.0209*** (0.0031)	0.0317*** (0.0031)	0.1263*** (0.0198)	0.1260*** (0.1260)
$intang_{jt}$	0.0415*** (0.0031)	0.0411*** (0.0031)	0.0815*** (0.0111)	0.0860*** (0.0118)
$ibex_{jt}$	2.3861*** (0.2428)	2.3157*** (0.2466)	9.7367*** (1.4434)	9.7356*** (1.4580)
N	9,300	9,298	9,300	9,298
R ²	0.3443	0.3525	0.2975	0.3015
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	No	Yes	No	Yes
Instrument	No	No	No	No

Source: By the authors. The main explanatory variable is the average tax rate borne by firm j in year t in non-tax haven territories (τ_{jt}). The control variables are: the natural logarithm of the number of employees of the parent firm j in t (p_{jt}) and the same squared (p_{jt}^2); the natural logarithm of the number of employees of the foreign non-haven affiliates of the firm j in t (nh_{jt}) and the same squared (nh_{jt}^2); the logarithm of the intangible fixed assets of the parent company ($intang_{jt}$) and the dummy variable $ibex_{jt}$. ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in parentheses.

Additionally, the huge effect of the Ibex variable is noteworthy for these estimates: Ibex-35 companies, and financial firms in particular (Tables 4, 5), besides being more likely to invest in a tax haven, have many more subsidiaries in tax havens and are also established in many more tax havens (as reflected also in Table 1). The relatively high coefficient of determination

for these estimates is also striking.

5. Tax Savings for Spanish Multinationals and Tax Revenue Consequences for Spain

In the previous sections we obtained evidence consistent with the use of tax havens by MNCs to reduce their tax burden by way of Profit-Shifting (P-S). This section calculates the tax savings of MNCs with and without tax haven affiliates, trying to answer the following questions: Do all Spanish companies with tax haven affiliates have tax savings? Do tax savings come only from MNCs with at least one tax haven affiliate, i.e., are tax haven territories the only destinations of paper profits?

Tables 11 and 12 summarize the possible scenarios for companies and residence countries derived from P-S of domestic MNCs, depending on countries' International Tax System and the Corporate Income Tax (CIT) rate they apply. Table 11 concentrates on P-S between foreign affiliates and Table 12 on P-S from the residence country to abroad.

Table 11. Profit-Shifting Between Foreign Affiliates: Tax Savings for Domestic Multinationals and Tax Losses/Profits for Residence Countries Depending on the International Tax System and the Statutory Corporate Income Tax Rate of Residence Countries

ITS/CIT rate	Relatively high ^a	Relatively low ^a
Territorial	1. Tax Savings for MNCs: Yes Tax Losses for countries: No	2. Tax Savings for MNCs: Yes Tax Losses for countries: No
Worldwide	3. Tax Savings for MNCs: No Tax Profits for countries: Yes	4. Tax Savings for MNCs: Yes Tax Losses for countries: No

Source: By the authors. (a) The level of the statutory CIT rate of residence countries is defined in comparison to the level of the CIT rate of countries to which profits are shifted.

Table 12. Profit-Shifting from the Residence Country to Abroad: Tax Savings for Domestic Multinationals and Tax Losses/Profits for Residence Countries Depending on the International Tax System and the Statutory Corporate Income Tax Rate of Residence Countries

ITS/CIT rate	Relatively high ^a	Relatively low ^a
Territorial	1. Tax Savings for MNCs: Yes Tax Losses for countries: Yes	2. -
Worldwide	3. Tax Savings for MNCs: No Tax Losses for countries: No	4. -

Source: By the authors. (a) The level of the statutory CIT rate of residence countries is defined in comparison to the level of the CIT rate of countries where profits are shifted.

According to the above scenarios, Spain can be classified as a type 1 country. This means that Spanish MNCs can benefit from P-S, both between foreign affiliates and from Spain to abroad. From the point of view of the country, the possible tax revenue losses come from P-S from Spain to abroad.

In order to calculate the tax savings for Spanish MNCs, we compare the global taxation of Spanish MNCs in a scenario without P-S (all else being equal), with their actual global taxation, taken from the Sabi database. Therefore, the tax savings for a MNC can be represented as follows:

$$Tax\ savings_{jt} = Taxation\ without\ PS_{jt} - Taxation\ with\ PS_{jt} \quad (2)$$

Taxation without P-S is estimated by taking the product between the weighted average tax rate of countries where the corresponding MNC operates and its consolidated profit before tax as an indicator for its global CIT base, taken from the Sabi database. It can be represented as follows:

$$\begin{aligned} Taxation\ without\ PS_{jt} &= \\ &= Weighted\ average\ tax\ rate_{jt} * Profit\ before\ tax_{jt} \end{aligned} \quad (3)$$

The average tax rate considered is the MNCs' average non-haven tax rate weighted by the GDP. On the one hand, unlike the average tax rate of section 6 ($\tau_{jt}(iii)$), it now incorporates

the Spanish CIT rate because the consolidated profit before tax includes both the profit generated in third countries and that generated in Spain.¹² However, it does not incorporate the CIT rate of tax havens,¹³ because we assume that the real economic activity in these territories is very limited. On the other hand, the GDP approximates the level of real economic activity in each country.

One last and important assumption is that the definition of the corporate groups we consider for estimating taxation without P-S is the same as that considered for estimating taxation with P-S.

We take the same MNCs as in the previous sections, a data pool of 4,809 different Spanish companies. However, the resulting sample is more limited due to the lack of consolidated information in the Sabi database for some of them. Moreover, we disregard the negative values of consolidated taxation and consolidated profit before tax.

The results for the tax savings of Spanish MNCs derived from P-S during the period 2013-2018 are shown in Table 13. As can be seen in column (1), the Spanish MNCs of the sample have overall tax savings that amount to more than €24 billion (33 billion if only positive values are considered) during the period 2013-2018, i.e., around €4 billion per year.¹⁴ In average terms, each MNC saves almost €2 million for 2013-2018, that is, around €300,000

¹² We did not consider the Spanish CIT rate in the previous sections because, although the probability of investing in tax havens may also be influenced by the CIT rate in the MNC residence country, this effect cannot be estimated due to lack of variation (Gumpert, Hines, and Schnitzer, 2016).

¹³ The tax haven list taken in this section is again the extended Hines and Rice (1994) list.

¹⁴ If we approximate the share of the global Corporate Income Tax base for each country with its GDP, we can estimate that, of the €4 billion saved per year, €660,000 thousand would correspond to P-S from Spain to abroad and, therefore, the rest to P-S through affiliates established in other countries. The latter figure would also approximate the maximum revenue loss for Spain as a result of that activity (Table 12), i.e., the loss if the tax rate of the benefit recipient country were zero.

per year.

Table 13: Tax savings 2013-2018 (€ Thousand). Descriptive Statistics

	(1) Tax Savings (TS)	(2) TS companies with tax havens	(3) TS companies without tax havens
Average	1,936	9,036	715
Average if TS>0	3,877	17,112	1,603
Maximum	1,115,095	1,115,095	297,011
Minimum	-502,095	-502,095	-239,183
Sum	24,669,328	16,898,441	7,770,887
Sum if TS>0	33,158,910	21,458,877	11,700,033

Source: By the authors.

Comparing the two kinds of MNCs (columns 2 and 3), Spanish companies, both with and without tax haven affiliates, have positive tax savings in average terms. That means that P-S is not limited to tax havens. However, the tax savings are, in average terms, higher for Spanish companies with tax haven affiliates than for companies with none. Also, the total tax savings are higher for the first group of companies: total tax savings for them accounts for 68.50% of total tax savings. And these results persist for positive tax savings (both for average tax savings and for total tax savings).

6. Conclusions and the Way Forward

Tax havens seem to be ideal places for Multinational Companies (MNCs) to artificially transfer their profits to in order to pay a lower tax, to the detriment of high tax territories where economic activity takes place. They have the most favourable tax conditions for foreign investors and other Profit-Shifting (P-S) friendly characteristics, such as stable governments.

In this vein, the hypothesis in this article is that MNCs set up affiliates in tax havens to reduce their taxes by means of P-S. Applying the approach of Gumpert, Hines and Schnitzer (2016), we obtained estimates consistent with this hypothesis: Spanish MNCs with higher foreign

non-haven tax rates, and thus those most likely to gain the most from P-S, are the ones with a higher probability of setting up tax haven affiliates. According to our data and the extended Hines and Rice (1994) tax haven list, the main tax havens for Spanish companies are the Netherlands, Panama, and Belgium.

Hence, it seems that there is room for the Spanish government to strengthen the rules against P-S, for equity and efficiency reasons but also in order to limit tax losses. Specifically, the article concludes that Spanish companies have saved, on average, around 4 billion euros per year in Corporate Income Tax in the period 2013-2018 as a result of this aggressive tax planning activity. Furthermore, tax savings exist for Spanish companies both with and without tax haven affiliates, but they are higher for companies in the first group.

This article has also shed light on the economic sector that might pursue P-S to a greater extent, i.e., the financial sector; and on some of the characteristics that may facilitate the activity, i.e., the size of companies, the use of intangible assets, the membership of the Ibex 35, or the presence of MNCs in more than one tax haven (a characteristic that is fulfilled by only a few MNCs). These results may be relevant to help governments design the most effective policies to end aggressive tax planning.

Although the previous results shed some light on the issue of P-S and tax haven investments, the choice of the tax haven list would have conditioned the results. Related to this, some avenues of progress are opened from this research. As Gumpert, Hines, and Schnitzer (2016: 714) themselves recognised and as our analysis of the tax revenue consequences indicates (i.e., tax savings exist for Spanish companies both with and without tax haven affiliates), although tax havens are probably the best territories to move profits to, companies could also benefit from “reallocating taxable income to affiliates located in nonhaven countries that

have moderately low tax rates”. Therefore, the analysis in this article can be completed by investigating in which territories (tax havens or not) Spanish MNCs invest for P-S reasons. In this study, the key issue will be to order the foreign affiliates according to the taxation of foreign profits at the end of the day, i.e., when foreign profits are repatriated to Spain.

An important step in the direction of strengthening the rules against P-S (both to tax haven and non-haven countries) has been taken by 137 countries, by agreeing on the *Statement on a Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy* as of November 2021, in order to update the international tax system within the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS).¹⁵ The Spanish Tax Agency has calculated the maximum tax revenue for Spain from the application of Pillar Two at a minimum effective tax rate of 15% at 2,300 million euros, i.e., 0.2% of GDP (Comité de Personas Expertas, 2022).

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data that support the findings of this study are available on request from the authors. The data are not publicly available due to commercial restrictions.

¹⁵ See <https://www.oecd.org/tax/beps/beps-actions/action1/>. For a recent assessment of the effects of implementing the Pillars (including revenue effects), see IMF (2022).

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Appendix

Table A1. Spanish MNC with and without Tax Haven Operations: Average 2013-2018

Financial information	Parents with TH affiliates	Parents without TH affiliates
Turnover (€M)	294.43	101.26
Total Assets (€M)	1,126.40	179.73
Intangible Assets (€M)	29.02	6.69
Number of Employees	836.35	332.87
Taxation (€M)	0.16	1.05
CIT rate	0.28	0.27
Profit/Loss before tax	32.21	5.26

Group information	Parents with TH affiliates	Parents without TH affiliates
Total Affiliates/Parent	31.36	6.9
Foreign Affiliates/Parent	17.62	2.96
Foreign Affiliates/Total Affiliates (%)	67.02	63.26

Industry information	Parents with TH affiliates	Parents without TH affiliates
Manufacturing firms (%)	21.59	30.61
Service firms (%)	43.83	47.00
Financial firms (%)	22.83	11.02
Other (%)	11.75	11.38

Source: By the authors.

Table A2. Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
y_{jt}	22,957	0.16	0.36	0	1
p_{jt}	20,255	411.66	2,370.14	1	89,500
nh_{jt}	22,858	381.61	4,195.71	1	225,000
$intang_{jt}$	16,614	10.28	82.72	-0.93	4,158
$ibex_{jt}$	22,957	0.01	0.07	0	1
τ_{jt}	22,741	0.2717	0.05	0.09	0.55
$\tau_{jt}(i)$	22,741	0.2715	0.05	0.09	0.55
$\tau_{jt}(ii)$	22,267	0.2712	0.06	0.09	0.55
$\tau_{jt}(iii)$	22,712	0.2935	0.06	0.1	0.55
$\tau_{jt}(iv)$	22,724	0.2834	0.06	0.09	0.55
$\tau_{jt}(v)$	22,250	0.2823	0.06	0.09	0.55

Source: By the authors.