

Are Spanish companies involved in Profit Shifting? Consequences in terms of tax revenues

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ABSTRACT

In this paper we analyse the existence of Profit Shifting between Spain and other OECD and EU countries. Using a sample of 1,083 Spanish subsidiaries owned by foreign OECD and EU parent companies and a sample of 271 EU subsidiaries owned by Spanish parent companies, taken from the AMADEUS Database for the period 2005-2014, and a simple tax rate difference as a measure of the tax incentive, we obtain a negative effect of Corporate Income Taxes on reported profits. When the tax rate differences between Spain and the foreign countries change in one percent point, reported profits change in approximately 2.7-3 percent points. That is consistent with the Profit Shifting activity of corporations and matches the empirical results in the literature. Furthermore, we calculate the tax revenue consequences for Spain of this activity from the sample of Spanish subsidiary companies and obtain that they vary over the years, depending on the level of taxation of the main investor countries in Spain in comparison to the Spanish tax rate.

JEL classification: F23, F69, H25, H26, H32

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1. Introduction

Among Multinational Enterprises (MNEs), Profit Shifting (PS) is a tax planning strategy within a group consisting of artificially shifting taxable income from entities located in high tax paying countries (basically, countries with a high Corporate Income Tax, CIT) to entities located in countries with lower tax rates (TRs).

PS phenomena, as well as other tax avoidance and tax evasion devices, cause what is known as Double Non-Taxation, which refers to the minimisation and sometimes zero taxation of certain taxable income (or more generally, taxable object). This Double Non-Taxation is related to the existing mismatch between the features of today's economy and the international taxation standards (based on the Separated Accounting Method) created a century ago, when international exchanges of goods and services were limited and business models were simple.

While the world economy is every time more globalized, the current international taxation standards require reporting separately the profits a MNE gets alongside the different jurisdictions in which it operates. This creates an opportunity for MNEs to develop strategies (most of which are legally acceptable) to reduce their tax burden because it is difficult to determine where profits are created¹. Moreover, the digitalization of the economy, the complexity of business models and the diversity of tax rules alongside the jurisdictions (which creates tax loopholes) make it easier for companies to develop these strategies.

Two of the most popular PS mechanisms among MNEs are Transfer Pricing and Thin Capitalisation. Transfer prices are the prices that entities set when they exchange services and/or goods within the multinational group (i.e. the prices applicable to related-party transactions), which should be determined as if the transaction were between independent enterprises (i.e., according to the arm's length principle). And the Thin capitalisation denomination refers to a situation in which a company is disproportionally financed by debt (i.e., it has a high debt/ equity ratio).

Both Transfer Pricing and Thin Capitalisation consist of declaring more revenues in the jurisdictions where TRs are most favourable and more deductible expenses in the ones where they are least favourable. The Transfer Pricing strategy achieves this result by manipulating the transfer prices according to taxes, which is relatively easy in some cases when there are no comparable transactions in the market. This is usually the case when transactions include intangible assets. And the Thin Capitalisation strategy

¹ In this context, the traditional international taxation problem of double taxation may also arise.

by group companies in low tax jurisdictions (where interest has to be reported and taxed) making loans to their sister companies in high tax jurisdictions (where interests are deducted²).

Apart from Double Non-Taxation, PS also causes an equity problem between territories because the movement of profits between jurisdictions is not accompanied by a parallel movement of the real economic activity that generates such profits. As a result, companies create value in some jurisdictions and report profits in others. So, through the PS strategy MNEs can take advantage of both the high yield provided by some jurisdictions by locating their investments in such jurisdictions, and at the same time, the low taxes of other jurisdictions by locating their taxable income there.

But according to Hines (2014:444-446), PS activity and the associated equity problem could be higher. There is evidence that MNEs do not accomplish this tax planning strategy entirely. In the first place, high tax countries go on collecting tax revenues from the CIT. In the second place, the real activity of corporations is still affected by taxes (there is a consensus on the subject in the empirical literature); and in the third place, not all MNEs have affiliates situated in countries with the most favourable tax treatment, the tax havens.

The reason is the cost of such activity for MNEs. According to Hines (2014:450), PS activity produces administrative and compliance costs and more importantly, cost deriving from the need to change real activity to enable income reallocation. Although PS activity disassociates reported profits from value creation, a certain level of real economic activity in the territories where profits are reported is necessary to justify such reported profits.

Nowadays, the main international institutions and governments are worried about PS and the reduced taxes paid by some MNEs. Since the financial crisis and the loss of economic resources, the taxation scandals of MNEs have become front page news. The key international taxation problem has changed from International Double Taxation to Double Non-Taxation, giving rise to a new paradigm of international taxation. One of the most important international initiatives tackling the situation is the OECD's Base Erosion and Profit Shifting (BEPS) project, launched in 2013, with the final reports published in September 2015 (OECD, 2015). This consists of a package of measures aimed at aligning taxation and value creation by driving needed changes and improvements in current international taxation standards. In addition to the OECD, the

² Dividends (which constitute equity remuneration), as opposed to interests, cannot be deducted (Fatica et al., 2012).

EU has been working on the international taxation problems from the beginning, and is now developing an Action Plan on Corporate Taxation (European Commission, 2015). Among other measures, the EU wants to relaunch the Common Consolidated Corporate Tax Base (CCCTB) proposal.

In this context, our paper sets out to prove the existence of PS by (subsidiary and parent) corporations located in Spain and to determine and assess the positive or negative consequences for tax collection in the country from two samples of Spanish subsidiary and parent companies.

The remainder of this paper is divided into six additional sections. Section 2 reviews the empirical literature. Section 3 explains the empirical methodology and data. Section 4 carries out a descriptive analysis of the sample. Section 5 presents the results. Section 6 accomplishes a series of additional analyses and robustness tests. And section 7 concludes.

2. Review of the empirical literature on Profit Shifting

There is a consensus on the existence of PS activity in the empirical literature. However, such a consensus does not exist with regard to the magnitude of the activity and the main methods used to accomplish it.

2.1. Proving the existence of Profit Shifting activity

Two kinds of empirical approaches are used to identify the existence of PS activity: direct and indirect. The direct approach consists of identifying particular PS strategies. Examples of this kind of empirical approach can be seen in Clausing, 2003; Dischinger and Riedel, 2011, Buettner et al., 2012 or Blouin et al., 2014. And the indirect one is based on the expected results of the PS activity.

Within the indirect approach the traditional model comes from Grubert and Mutti (1991) and Hines and Rice (1994) and rests on the assumption that corporations declare more profits in territories with relatively low CIT taxes: it then postulates a negative relationship between profits and taxes. Although this result is found if PS activity exists, the same is true when companies, instead of moving taxable income due to taxes, move their investments due to taxes, other kind of tax planning behaviour that has been widely proven by the empirical literature, because investments generate profits.

For this reason the basic premise of the Hines and Rice approach is that MNEs' reported profits are equal to the true profits derived from economic activity plus the

profits derived from PS activity (positive or negative). Therefore in analysing the relationship between reported profits and taxes it is necessary to control for other explanatory variables with an impact on the true profits of enterprises. They have usually been proxies of the inputs capital and labour and its productivity.

Since Hines and Rice (1994), a great deal of empirical work has used the same approach. We can, for example, point to Huizinga and Laeven (2008) or Lohse and Riedel (2013). A review of the indirect evidence can be found in Heckemeyer and Overesch (2013). Moreover, a summary of the papers that follow this indirect approach can be seen in the Appendix 1.

There are also other more recent economic and accounting indirect approaches to prove the existence of PS behaviour: it can be mentioned the papers of Collins, Kemsley and Lang, 1998; Klassen and Laplante, 2012; Dyreng and Markle, 2016 or Dharmapala and Riedel, 2013; but the Hines and Rice approach has been most used to date.

2.2. Evaluating the magnitude of Profit Shifting activity and identifying the main strategies used to accomplish it

As remarked above, there is no consensus on the magnitude of PS phenomena and therefore, on the consequences for tax collection. However, as Hines (2014:444) point out, the economic consequences of the PS behaviour motivated by CITs cannot be very significant, given that CIT amounts to a very small part of the total tax revenues of major economies (the same is not true in less developed countries). In any case, what is clear and really significant is the fact that there is a distributive justice problem between territories.

Heckemeyer and Overesch (2013) performed a meta-analysis considering all possible variables that could have affected the magnitude of the varied results from 25 studies based on indirect approaches, and derived a semi-elasticity of pre-tax profits with respect to the international tax differential of 0.8, in absolute terms. This means that “reported profits decrease by about 0.8% if the international tax differential that can be exploited for tax arbitrage increases by 1 percentage point” (Heckemeyer and Overesch, 2013:2). They also obtained that non-financial strategies (Transfer Pricing and licensing) dominate over financial ones (Thin Capitalisation).

On the other hand, Heckemeyer and Overesch (2013:10-16) detected a series of methodological choices made in the different empirical works that could have affected the range of quantitative results. These choices refer to the proxies of the model

variables (the measure of the companies' profits used as a dependent variable, the tax incentive proxy, and the labour and capital indicators), the disaggregation level of the data and the econometrics.

With regard to the proxies used for the dependent variable it is possible to distinguish four kinds of measures: pre-tax profits, post-tax profits, pre-tax earnings and post-tax earnings. According to these authors, using earnings instead of profits is expected to lead to a lower magnitude of PS behaviour because of the exclusion of interest and thus, of the financial strategies (Thin Capitalisation) for PS. Also, the impact of CITs on profits is expected to be higher when the measure of the dependent variable includes taxes.

The treatment given to the measure of the CIT incentive for PS is another major methodological issue. Some papers have used as proxy for this measure only the TR of the country where profits are reported, while others (first Huizinga and Laeven, 2008 and later De Simone, 2016 and Markle, 2016) have calculated weighted average TR differences considering all TRs and profits shifting opportunities throughout the territories where the MNE operates.

Lastly, we would like to emphasize the introduction of industrial Fixed Effects in the econometric specification as a way to control for the use of intangible assets. There are some economic sectors that use a high level of intangible assets (such as pharmaceuticals), which according to Dischinger and Riedel (2011:693), could have important effects on both true profits and shifted profits. Intangible assets usually produce a relatively high level of profits, and at the same time, make the Transfer Pricing strategy of MNEs easier. The prices of these assets are difficult to set according to the arm's length principle because of the lack of similar transactions on the market (Grubert, 2003:226). Thus, companies in sectors which use a high level of intangible assets have more opportunities to use the Transfer Pricing strategy to shift profits.

3. Empirical methodology and data

3.1. Empirical methodology

We use the Hines and Rice indirect approach to verify the existence of PS activity by companies located in Spain. In addition to the basic premise of this approach (reported profits are equal to true profits plus shifted profits) Hines and Rice (1994:16) assume that PS activity is costly. As we explained in the introductory section, there is evidence

that PS activity is not fully performed due to such costs. In particular, Hines and Rice (1994) assume that marginal costs from PS activity increase as the ratio of reported profits to true profits increases.

This equation shows the main idea of the Hines and Rice approach:

$$\pi_i = \rho_i + \phi_i - \frac{a}{2} \frac{(\Phi_i)^2}{\rho_i}; \quad (1)$$

Where π_i are the reported profits in country i , ρ_i are the true profits in country i , ϕ_i are the profits shifted from or to country i , and $\frac{a}{2} \frac{(\Phi_i)^2}{\rho_i}$ are total PS costs in any of the two-way directions, being the parameter $a > 0$.

From this initial equation, the authors derive the expressions for shifted and true profits. On the one hand, they calculate the expression of a MNE's optimal profits shifted by maximising global profits net of taxes (t_i) and PS costs (taking as fixed true profits).

$$\begin{aligned} \text{Max } (\text{global net profits}) = \\ \sum_{i=1}^n (1 - t_i) \left(\rho_i + \phi_i - \frac{a}{2} \frac{(\Phi_i)^2}{\rho_i} \right) \\ \text{subject to } \sum_{i=1}^n \phi_i \leq 0 \end{aligned} \quad (2)$$

And on the other hand, they estimate true profits (which are not observable) from a Cobb-Douglas production function $Q = cA^\varepsilon L^\alpha K^\phi e^u$. Where A is the level of productivity in the local country, L is the labour input, K is the capital input, c is a constant term, ε , α and ϕ are the output elasticities of the respective inputs and the productivity, and e^u is a random term. Assuming that true profits are equal to the production function less the labour costs, which are the wage (w) times L , and assuming w is equal to the marginal product of labour, they derive the following expression.

$$Q - wL = (1 - \alpha)cA^\varepsilon L^\alpha K^\phi e^u \quad (3)$$

Making some substitutions and calculations to define a particular measure of the tax incentive variable, the authors derive an expression in logarithms similar to this one for analysing the existence of the PS activity:

$$\ln(\pi_i) = \beta_1 + \beta_2 \ln A_i + \beta_3 \ln L_i + \beta_4 \ln K_i - \gamma(\text{Tax incentive}_i) + u_i; \quad (4)$$

Where $\beta_1 + \beta_2 \ln A_i + \beta_3 \ln L_i + \beta_4 \ln K_i$ accounts for reported profits derived from the real activity of MNEs, and $\gamma(\text{tax incentive})$ accounts for reported profits derived from their PS activity.

Different from Hines and Rice (1994), who used cross-section country data, our work is based on affiliate-level panel data. Then, the basic equation we estimate is the following:

$$\ln(\pi_{it}) = \beta_1 + \beta_2 \ln A_{it} + \beta_3 \ln L_{it} + \beta_4 \ln K_{it} - \gamma(\text{Tax incentive}_i) + \phi_i + \rho_t + u_i; \quad (5)$$

Where t indicates the time period and the sample units i are individual companies, and where ϕ_i denotes subsidiary fixed effects that account for unobservable constant-over the period characteristics (like their know-how or their transfer pricing policy) and ρ_t the time period dummies, which control for common shocks over the years (like the recent economic crisis).

It is essential to know the particular definition of the tax incentive variable to interpret the results of the estimation correctly, taking into account the negative relationship between taxes and reported profits in a particular territory derived from the PS activity. If the tax incentive measure is the TR of the local jurisdiction where profits are reported, it is clear that PS activity should lead to estimating a negative effect. However, if the measure is a TR difference between territories, the interpretation depends on how the subtraction has been calculated.

We use a simple TR difference between territories (the host and the residence country of the companies) as a proxy for the international tax incentive to shift profits, in the same way as some authors did (Mills and Newberry, 2004; Clausing, 2009; Dischinger, 2010; Blouin et al., 2011; Dischinger and Riedel, 2011; Becker and Riedel, 2012; or Dischinger et al., 2014). In particular, the difference between the Spanish TR and the respective TR of the OECD and/or EU country where the parent company of the subsidiary is situated ($T_{ES} - T_{EX}$) is calculated for the sample of Spanish subsidiaries, and the difference between the TR of the EU country where the subsidiary is located and the Spanish tax rate is calculated for the sample of foreign subsidiaries ($T_{EU} - T_{ES}$).

As a result of this definition of the tax incentive we cannot draw general conclusions about the magnitude of the PS activity within the whole multinational groups. We are only considering the PS activity between two of the various affiliated companies of each multinational group (the parent and a subsidiary), while the PS activity is characterised by taking advantage of the within-group CIT differences.

The indicator of the tax rates is the top statutory CIT rate of the countries (including local taxes) and the information comes from KPMG (2006) and the KPMG website³. And the expected effect on reported profits is negative. Regarding the sample of Spanish subsidiaries, as the Spanish tax rate increases (decreases) to the foreign tax rate, reported profits in Spain should decrease (increase). And regarding the sample of EU subsidiaries, as the respective EU tax rate increases (decreases) to the Spanish tax rate, reported profits in such EU country should decrease (increase). Relative to the quantitative results, since the dependent variable (reported profits) is in logarithms and the tax incentive variable is in levels, γ gives directly the semi-elasticity of reported profits with respect to taxes.

Apart from the affiliate financial variables and the tax incentive, the Hines and Rice approach incorporates the level of productivity of the territory where profits are generated to the model. The level of productivity is measured as the logarithm of the GDP per capita. Because of the within transformation of the model (which we refer to later) and the limited variability of the Spanish GDP pc over time, we eliminate this variable from the estimation for the sample of Spanish subsidiaries. The GDP pc of the EU territories for the sample of foreign subsidiaries is the real GDP pc in thousand euros and is taken from Eurostat⁴.

3.2. Data

The present PS analyses rest on two samples of companies related to the Spanish territory taken from the AMADEUS database (from the Bureau Van Dijk) for the period from 2005 to 2014. We merely examine PS from or to Spain and therefore we cannot draw general conclusions either about what happens worldwide, nor conclude that PS does not exist if we do not find evidence about it.

One sample encompasses Spanish subsidiaries owned by OECD and/or EU parent companies, and the other encompasses EU subsidiaries owned by Spanish

³ <http://www.kpmg.com/global/en/services/tax/tax-tools-and-resources/pages/corporate-tax-rates-table.aspx>

⁴ <http://ec.europa.eu/eurostat/data/database>

companies. The limitation of this second sample to EU (instead of estimating a symmetric sample of OECD and EU subsidiaries owned by Spanish parent companies) is because the AMADEUS database only provides financial statements and ownership data for European companies.

For both samples we limit the analyses to non-financial subsidiaries owned by industrial parent companies⁵. Parent companies are those denominated Global Ultimate Owners (GUOs) in AMADEUS. In particular, the definition we have taken for the GUOs considers a minimum percentage for the path from a subject company to its GUO of 25.01%.

Moreover, we have had only access to data of big and very big companies⁶. However, we consider this to have been an advantage because PS activity is usually carried out by this type of companies. Therefore, we think the samples we consider are representative of the companies engaging in PS.

Initially, the sample of Spanish subsidiary companies was comprised of an unbalanced panel of 2,212 units and the sample of EU subsidiary companies of another one of 550. For these two samples we downloaded the following unconsolidated financial data: Profit Before income Tax expense as a measure of the dependent variable π (the AMADEUS variable PLBT), Fixed Assets as a measure of the input capital K (FIAS) and Cost of Employees as a measure of the input labour L (STAF), all of them in thousand euros.

Following the previous literature, subsequently we aggregated the annual observations of those subsidiaries located in the same country and belonging to the same parent company for each financial variable⁷. We only aggregated the data for those years in which financial information was available for all the eligible subsidiaries (those in the same host country and belonging to the same parent company). Then, we disregard those annual financial observations when data were not available for all the eligible subsidiaries for data consolidation.

⁵ According to the AMADEUS database, the category industrial companies include all companies that are not banks or financial companies nor insurance companies.

⁶ According to the AMADEUS database, for a company to be categorized as large or very large it is only necessary to fulfil one of the three criteria about turnover (≥ 10 and ≥ 100 million € for large and very large companies, respectively), total assets (≥ 20 and ≥ 200 million €, respectively) or total number of employees (150 and 1,000, respectively). Moreover, AMADEUS classifies the companies' size from the last available year in the database.

⁷ The number of aggregated units is the same as the number of parent companies for the sample of Spanish subsidiaries because in this case the only host country is Spain.

Lastly, once the data were brought together, we eliminated those observations with a non-positive value from the sample in order to transform the financial variables in logarithms. We also eliminated those observations for which no data for the dependent variable (PLBT) were available.

As a result of this procedure, the sample of Spanish subsidiaries is made up of 1,083 individuals and the sample of EU subsidiaries of 271. From now on we will call each of these aggregated units (or individuals) a subsidiary, although this is not the accurate denomination.

4. Descriptive analysis of the sample

To begin with, we had a look at the series of values of our focal explanatory variable, the tax incentive. With regard to the sample of Spanish subsidiaries, the number of times in which there is an absolute difference higher than or equal to 0.1 (which could be consider a high difference) is 2,076 (out of 7,294 observations). Moreover, this large difference exists for both sides of the distribution. The number of times in which the Spanish tax rate is higher than the foreign tax rate in 0.1 points is 457 (out of 3,533 positive observations) and the number of times in which the Spanish tax rate is lower than the foreign tax rate in 0.1 points is 1,619 (out of 3,761 negative observations).

In the sample of EU subsidiaries we do not find so large differences. The number of times in which the foreign EU tax rate is higher than the Spanish tax rate in 0.1 points is 0 (out of 699 positive observations) and the number of times in which the respective EU tax rate is lower than the Spanish tax rate in 0.1 points is 313 (out of 1,876 negative observations). For this sample the number of negative observations is much higher than the number of positive observations, which means that the Spanish tax rate is relatively high in comparison to the tax rate of the rest of EU countries.

Secondly, also related to the tax incentive variable and the sample of subsidiaries, Table 1 and Table 2 provide information about the number of parent and subsidiary companies by country for each of the samples respectively. Table 1 shows the OECD and EU countries investing in Spain ordered according to their importance in terms of number of parent companies. And Table 2 shows the Spanish EU investment destination countries ordered according to their importance in terms of number of subsidiary companies, which constitute the sample in this other direction. These tables give an idea about which countries and their corresponding tax rates could be the most influential ones on the results.

Additionally Table 3 shows the number of subsidiaries by parent company for the sample of EU subsidiaries (owned by Spanish parent companies), which adds information about the higher influence of some of the Spanish parent companies that own EU subsidiaries on the results.

Table 1: Spanish subsidiary companies: Number of parent companies by country

GUO country	Companies	MX	9
US	282	KR	8
LU	135	NO	8
DE	112	AT	6
FR	93	IL	6
GB	92	MT	6
JP	84	AU	5
NL	82	CY	4
IT	52	PL	3
CH	43	CL	2
BE	27	GR	2
DK	27	TR	2
CA	19	CZ	1
SE	18	IS	1
IE	16	NZ	1
PT	11	SI	1
FI	10	SK	1

United States, Luxembourg, Germany, France, United Kingdom and Japan are the countries with the highest number of parent companies owning subsidiaries located in Spain. Within them, United States, Germany and France have relatively high statutory TRs.

Table 2: EU subsidiary companies: Number of subsidiary* companies by country

Subs. country	Companies		
FR	57	GR	7
PT	57	BG	5
IT	47	SK	5
GB	37	NL	4
DE	22	SE	4
PL	19	AT	3
BE	14	MT	2
CZ	14	HU	1
RO	9	LT	1
IE	8	LU	1

For this other sample of EU subsidiaries the most important host country territories in terms of number of subsidiaries are France, with a relatively high CIT rate, and Portugal, with a relatively low CIT rate.

Table 3: EU subsidiary companies: Number of subsidiaries by parent company

Number of parent companies	Number of subsidiaries by parent country
1	9
3	7
6	6
2	5
4	4
12	3
23	2
143	1

From Table 3 we can see that there is a Spanish parent company with a large influence on the results because it has the highest number of subsidiaries (nine subsidiaries). However, the majority of parent companies (143 out of 194 Spanish parent companies) have only one EU sample subsidiary (or sample unit).

Table 4 and Table 5 present the descriptive statistics of the basic model variables, and Table 6 and Table 7 the correlation matrix of the explanatory factors.

Table 4: Spanish subsidiary companies: Descriptive statistics (thousand€)

	N	Mean	SD	Min	Max
Π	7,294	10,356.98	79,290.4	0.13	5,430,267
K	7,242	64,002.91	314,802.8	0.14	11,900,000
L	6,915	16,156.45	44,388.83	0,99	668,475.2
$T_{ES} - T_{EX}$	7,294	-0.01	0.06	-0.10	0.25

Table 5: EU subsidiary companies: Descriptive statistics (thousand€)

	N	Mean	SD	Min	Max
Π	1,876	5,432.72	23,814.16	0.54	560,693.3
K	1,853	41,657.49	254,987.6	1.35	8,835,699
L	1,667	7,385.66	22,129.19	1.69	339,238.8
GDP pc	1,876	24.66	8.97	4.6	78.1
$T_{ES} - T_{EX}$	1,876	-0.03	0.06	-0.22	0.05

Table 6: Spanish subsidiary companies: Correlation matrix

	K	L	$T_{ES} - T_{EX}$
K	1		
L	0.43	1	
$T_{ES} - T_{EX}$	0.05	0.04	1

Table 7: EU subsidiary companies: Correlation matrix

	K	L	GDP pc	$T_{ES} - T_{EX}$
K	1			
L	0.62	1		
GDP pc	0.08	0.10	1	
$T_{ES} - T_{EX}$	0.07	0.09	0.65	1

5. Results

5.1. Spanish subsidiary companies

We have used static panel data techniques to derive the effect of the international tax incentive on Spanish reported profits since the sample of subsidiaries are observed for a ten-year period and there exist non observable heterogeneous characteristics between them which panel data techniques let us to control for. Particularly, according to the Hausman test a Fixed Effects model has been estimated. This method solves the endogeneity problem caused by unobservable subsidiary companies' features which affect reported profits to be correlated with observable explanatory variables. We present our results in Table 8.

Table 8: Basic Results

lnL	0.66 (13.58)***
lnK	0.05 (2.38)**
$T_{ES} - T_{EX}$	-2.74 (-4.27)***
N	6,890
R^2	0.10
Subsidiary FE	Yes
Year dummies	Yes

Note: lnL is the logarithm of the cost of employees; lnK is the logarithm of the fixed assets; and $T_{ES} - T_{EX}$ is the difference between the Spanish tax rate and the tax rate of the foreign country where the parent company is situated. Subsidiary Fixed Effects and Year dummies are also included and estimations are Panel corrected standard error (PCSE) estimations. ***, ** and * denoting statistical significance at the 1, 5 and 10 per cent levels, respectively.

The obtained results are in line with the empirical literature (a summary of this literature can be seen in Heckemeyer and Overesch, 2013 and Dharmapala, 2014). A negative relationship between the tax incentive to shift profits and reported profits is derived, which indicates that taxes and profits are negatively correlated and corroborates that subsidiary companies located in Spain are involved in PS activity. Spanish companies report profits lower (higher) than true profits when the Spanish TR is higher (lower) than the foreign TR of the country where the parent company is located.

Particularly, it has been estimated a semi-elasticity of 2.74, which indicates that if the simple TR difference (the Spanish TR minus the foreign TR) increases by 1%, reported profits in Spain decrease by 2.74%. That means that the change of the Spanish TR from 30% to 28% (which entails a reduction of almost 6.66%) in 2015 should lead to an increase of reported profits in Spain of 18.24% (assuming all else being equal).

Although the tax incentive measure that has been used is the same as employed in the literature, one should be cautious with the magnitude and interpretation of results. In spite of the fact that our aim is to measure the PS activity between the Spanish subsidiaries and their respective parents, it is necessary to take into account that PS is a within multinational group activity. As a result it is possible that PS between Spain and the residence country of the multinational group is not only explained by the difference in their respective tax rates, but also by the difference between the Spanish CIT rate and the other affiliated subsidiaries tax rates. That means that the estimated coefficient of the simple tax incentive we have built could also be capturing the effect of the tax incentive of other affiliated companies (and the result could have overstated/undervalued), being necessary to control for this other tax incentives.

Huizinga and Laeven (2008), De Simone (2016) and Markle (2016) are examples of papers using a measure of the tax incentive that captures all taxes of the countries in which the multinational groups operate. Moreover, these authors also consider the opportunity of this activity to exist alongside the different affiliates by weighting the tax rates by the level of real economic activity of those affiliates in each country.

In addition to the level of real economic activity, there may be other characteristics related to the distribution of functions within multinationals that could limit the PS opportunities and thus, the possibility of transferring profits from or to whichever affiliate of the group. For example, according to Huizinga and Laeven (2006) while subsidiaries within a group may perform similar tasks, the same is not true between subsidiaries and parent companies. Being as a consequence at this last case higher scope for transactions and thus, for PS activity.

Therefore, comparing the tax rate of parents and subsidiaries (in this case, an only subsidiary) might be a good approximation of what happens between Spain and their main investment partner countries because of the special role of the parent companies within multinational firms. Our concern is more associated to the possible influence of the other subsidiary companies tax rates on the PS activity between the Spanish subsidiaries and their foreign parents.

5.2. Tax revenue consequences

Taking the estimated semi-elasticity of the tax incentive it is feasible to calculate in a very simple way the tax revenue consequences for Spain of the disappearance of PS activity. But we have to make some important assumptions. Firstly, it is necessary to assume that the elimination of PS activity does not change the MNEs' investments decisions, all else being equal. And secondly, that the average semi-elasticity is the same for all years in the sample and for any tax rate difference (high and low tax rate differences).

Holding these assumptions in mind, we quantify the difference in terms of tax revenues for Spain over the period 2005-2014 in a similar vein to Clausing (2009). To that end it was necessary to calculate the new reported profits in absence of the PS activity (the actual profits) from the semi-elasticity of reported profits to taxes estimated. The results are showed in Table 9.

Table 9: Tax revenue consequences for Spain of removing Profit Shifting activity, 2005-2014 (thousand €)

	Spanish CIT rate	Reported Profits	Actual Profits	Difference in Profits	Difference in CIT revenues
2005	0.35	4,550,121.12	4,686,129.84	136,008.71	47,603.05
2006	0.35	6,885,672.07	7,387,158.11	501,486.03	175,520.11
2007	0.325	7,972,168.03	8,059,932.89	87,764.86	28,523.58
2008	0.3	6,832,294.57	6,578,175.49	-254,119.07	-76,235.72
2009	0.3	7,307,299.21	6,999,731.71	-307,567.50	-92,270.25
2010	0.3	7,669,336.8	7,426,842.45	-242,494.34	-72,748.30
2011	0.3	6,828,087.5	6,638,790.48	-189,297.02	-56,789.10
2012	0.3	9,480,885.69	9,637,057.11	156,171.42	46,851.42
2013	0.3	7,107,661.71	7,069,800.34	-37,861.36	-11,358.40
2014	0.3	10,910,274.8	12,225,958	1,315,683.23	394,704.96

As one can see in Table 9, it seems from our sample of Spanish subsidiary companies that during the period 2005-2014, Spain has been sometimes winner and sometimes loser of the PS activity, standing out the additional tax revenues Spain could have won in 2014 if PS activity had disappeared. According to our results, the years in which Spain would have been a net loser of the PS activity, are 2005, 2006, 2007, 2012 and 2014. That means that in those years reported profits in Spain were lower than actual profits, which is coherent with the high CIT rate of Spain during the three first years of the sample. A deeper analysis is needed to know the reasons behind the results for 2012 and especially, 2014. And the years for which reported profits in Spain were higher than real profits are 2008, 2009, 2010, 2011 (when the Spanish CIT rate reduced) and 2013.

We do not want to provide a general figure nor make a general assessment about the consequences in terms of tax revenues for Spain of the PS activity for the whole period for several reasons. In the first place, we want to be cautious because of the assumptions we made to derive these results. Secondly, as we said previously also the tax incentive effect we used to estimate the tax revenues could be overstate or undervalue, depending on the tax rates of the other affiliated companies in the groups. And third, one needs a complete picture of the Spanish companies in order to evaluate the actual tax revenue consequences for Spain. That means that we need to develop the same analysis for a symmetric representative sample of foreign companies owned by Spanish parent companies. Despite the caveats we pointed out with regard to the tax revenue results, it is worth to examine and explain the figures behind them. In order

to follow the explanation easily we added the Appendix 2, which contains more disaggregated information about these results.

Tax revenue results depend on the level of the CIT rate of the main investor countries in Spain in comparison to the Spanish one. As a first step, if one has a look at the evolution of the number of (Spanish subsidiary companies) observations by parent company's country and year (Table A2.1 of Appendix 2), one can have a first idea about the most influential countries on the results. United States is the one with the highest number of observations all the years (as also shown in Table 1 it is the most important country in terms of location of parent companies). The US tax rate is higher than the Spanish one over the whole sample period. That necessarily means that there are also other important foreign investor countries in Spain which have a low CIT rate. If not, results from the elimination of PS would have been negative all years. We can see that the number of observations is also high for Germany, Luxembourg, Japan, France and United Kingdom (which according to Table 1 are the other more important countries in terms of location of parent companies).

Disaggregated data on the differences in profits of eliminating the effect of the PS behaviour (differences between actual and reported profits) by parent company country and year can be seen in Table A2.2 of Appendix 2. Particularly, this table shows the percentage that these differences account for on the annual total differences, where a positive sign indicates that PS was harmful for Spain (because the Spanish tax rate was higher than the foreign tax rate and thus Spain could have earned additional euros if PS had not existed) and a negative sign that it had a positive effect on reported profits (because the Spanish tax rate was lower than the foreign tax rate). One can observe that the highest positive differences of eliminating the PS effect comes from United Kingdom (all years but 2005, 2008 and 2013) and Switzerland (for the years 2005, 2008 and 2013), standing out the positive difference in 2014 coming from United Kingdom (which represents a 106.98% of the positive difference of that year). Another crucial country for the exit of profits from Spain is Ireland. On the other hand, the highest negative differences come from US.

Table A2.3 and Table A2.4 of Appendix 2 display separately each of the two components responsible of these differences in profits. Table A3.3 displays the nominal CIT rates of the parent companies' country over the years⁸ and Table A3.4 contains information about the Spanish reported profits by parent company's country and year.

⁸ According to Table A3.3 the highest tax rate difference is reached in 2005 and 2006, and it belongs to the difference with Cyprus when the Cypriot tax rate was 10% and the Spanish one 35%.

We can conclude that the main responsible countries for the results are United Kingdom with regard to the harmful effect of PS on Spanish reported profits and United States with regard to the beneficial one. These are the countries with the highest volume of reported profits in Spain, standing out the very high percentage of 52.32 % of United Kingdom in 2014.

5.3. EU subsidiary companies

We also estimated a Fixed Effect model for this other sample of EU subsidiaries. Table 10 exhibits the results.

Table 10: Basic Results

lnL	0.54 (7.12)***
lnK	0 (0.31)
$T_{EU} - T_{ES}$	-2.99 (-1.98)**
ln(GDP pc)	-0.65 (-0.86)
N	1,648
R ²	0.09
Subsidiary FE	Yes
Year dummies	Yes

Note: lnL is the logarithm of the cost of employees; lnK is the logarithm of the fixed assets; $T_{EU} - T_{ES}$ is the difference between the tax rate of the EU country where the subsidiary company is situated and the Spanish tax rate; and ln(GDP pc) is the logarithm of the GDP pc of the host country. Subsidiary Fixed Effects and Year dummies are also included and estimations are Panel corrected standard error (PCSE) estimations. ***, ** and * denoting statistical significance at the 1, 5 and 10 per cent levels, respectively.

As shown in Table 10 the effect of the tax incentive is similar to that obtained from the bigger sample of Spanish subsidiaries. Taxes affect negatively reported profits and the semi-elasticity estimated is of 2.99. If the TR difference (the EU tax rate minus the Spanish TR) increases by 1%, reported profits in the respective EU country decrease by 2.99%. As in the previous sample, one needs to be cautious with this result. Our tax incentive measure compares always the foreign tax rates to the Spanish one (and in this case the foreign tax rates are only those of the EU) and is only based on the tax rates of two of the countries where multinational groups operate.

The evaluation of the results in terms of tax revenues makes no sense for this other sample because it is not symmetric to the former one. We preferred to carry out such analysis for the broadened sample of Spanish subsidiaries (which evaluates the transfer of profits between Spain and the EU and OECD countries).

However, we additionally estimated a symmetric sample of Spanish subsidiaries owned by EU countries in order to evaluate the influence of the OECD countries on the results and have an idea about what could happen with the revenues in Spain at the Spain-EU limited scenario. Again, we got a very similar negative semi-elasticity of 2.94. Results for this limited sample can be seen in Appendix 3.

Thus, the effect of taxes on reported profits barely changes when we exclude the OECD (and non-EU) countries from the calculation of the tax incentive. Therefore, for this limited sample of Spanish subsidiaries we can predict more positive results in terms of tax revenues since the most important countries in terms of reported profits in Spain are United Kingdom and United States (Appendix 2) and United States is excluded from the calculation of the tax incentive. The same more positive results can be foreseen for the sample of EU subsidiaries since the estimated semi-elasticity is also very similar for it.

6. Additional analyses and robustness tests

In this section some additional analyses and robustness tests are developed to check the consistency of our results and to analyse the effect of some interesting features related to the companies and the tax incentive.

We concentrate on the Spanish subsidiaries sample because is the highest one and the sample from which the tax revenue results are calculated, but similar results can be found in Appendix 4 for the sample of EU subsidiaries.

6.1. Additional explanatory variables

In the first place the basic model is going to be broadened by adding some other explanatory variables which could impact reported profits in a territory. In thinking about possible additional variables it is useful to distinguish between different groups of them depending on affiliate, multinational group and country level characteristics. Moreover, because our model includes Subsidiary FE (which absorb the impact of over the period constant variables, and also the effect of other not-subsidiary related constant variables), we need to think of factors which show certain evolution over time⁹.

Following the empirical literature, we widen the basic model by introducing two host country characteristics related to the economic situation of the territory: the Spanish

⁹ This is the reason why we did not include the level of productivity of Spain measured by its GDP pc.

GDP pc growth and the inflation rate, measured by the consumer price index, both taken from the World Bank Development Indicators. Regarding the expected impact of these variables, if profits are pro-cyclical the effect of GDP pc growth on profits will be positive (Lohse and Riedel, 2013). More doubts emerge related to the effect on the inflation rate. According to Azémar (2010), inflation could also be used as an indicator of a country macroeconomic instability. Thus, it may have a negative impact on reported profits. On the other hand, it may be overstating companies' profits (Loretz and Morkas, 2011).

Results are shown in column one of Table 11. One can see that the basic model variables and particularly the tax incentive are robust to the introduction of the two additional variables. For these last variables, the pro-cyclical behaviour of profits is confirmed for the GDP pc growth variable and the inflation rate has a negative impact, which is in line with the higher instability hypothesis.

Instead of controlling for the previous two additional explanatory variables, one can directly check the impact of the economic crisis on profits by introducing a dummy variable taking the value of 1 for the years 2008 on (including 2008), and zero otherwise. As a consequence of the pro-cyclical behaviour of profits, the expecting sign of this variable is negative. Moreover, the crisis could have also affected reported profits through the tax incentive measure if as a consequence of it taxes had impacted differently on reported profits. For example, the crisis could have facilitated some tax planning strategies to transfer profits.

Result in column two of Table 11 corroborates our expectation, the crisis impacted negatively on reported profits. On the other hand, if one looks at column three of Table 11, it is possible to see that additionally the effect of the tax incentive variable is more negative for the crisis years. The results for the other variables keep also very similar for this alternative specification.

Apart from the crisis variable, there may be other factors modifying the effect of the tax incentive on reported profits. Particularly we are additionally interested in checking the possible distinct effect of taxes depending on the level of intangible assets used by companies, on the one hand. And on the other hand, we want also to test the different effect of the tax incentive by subsamples within it.

Firstly, as said before intangible assets could facilitate the transfer pricing strategy to shift profits because of their singularity and the difficulty to set an arm's length price for them. In this sense, one could expect that taxes would affect reported profits more

negatively as corporations have a higher level of intangible assets. However, as also said in the second section, at the same time intangible assets impact positively on profitability and thus on reported profits. That could make companies less sensible to taxes.

At the same time, the use of intangible assets varies alongside the different economic sectors. Thus, one way to evaluate the impact of the use of this kind of assets on reported profits is to identify those economic sectors with a high use of intangible assets and check if they impact reported profits differently to the other economic sectors. According to Mas and Quesada (2014), the sectors with the highest level of intangible assets to the output they generate are coke and refined petroleum products; chemical products; computer, electronic and optical products and manufacture of transport equipment.

We construct the binary variable *Sector* in order to evaluate the influence of this characteristic of the companies on the effect of the tax incentive on reported profits. The variable takes the value of one for those subsidiaries whose parent companies belong to one of the aforementioned economic sectors with a high level of intangible assets, and zero otherwise. We take into account the sector of the parent companies instead of the sector of the subsidiaries because the aggregation process we carried out to construct our sample units does not allow us to identify only one economic sector for each sample unit.

Finally, the variable added to the basic model is the interaction term $\text{Sector} * (T_{ES} - T_{EX})$, whose effect is not determined and will depend on the predominant effect of intangible assets on reported profits.

As presented in column four of Table 11 it seems that companies with a high level of intangible assets are less sensible to PS strategies. Although PS opportunities increase in presence of a high level of intangible assets, finally the positive effect of intangible assets on real profits dominates.

Regarding the incentive effect depending on subsamples within it we distinguish two kinds of groups. In the first place, the effect of the tax incentive could depend on the magnitude of the tax rate differences. It is possible that higher tax rate differences generate higher tax incentives to shift profits. To check it the binary variable *Highdift* is generated, which takes the value of 1 when differences were higher than 0.1 in absolute terms (and zero otherwise) and it is interacted with the tax incentive variable.

In the second place, the effect of taxes could vary depending on the bigger or smaller level of the subsidiaries tax rate to their respective parent companies tax rate. Regarding this last characteristic, according to Dischinger et al. (2014:257-268) PS semi-elasticity from parents to affiliates is lower than that from affiliates to parents. If that was true, the tax semi-elasticity should be higher when the Spanish tax rate was higher than the foreign tax rate. In this case the interaction term $\text{Hight}^*(T_{ES} - T_{EX})$ is generated, where Hight is a binary variable which takes the value of 1 when the subsidiary tax rate is higher than the parent company tax rate (and zero otherwise).

Results for these two additional tests are respectively in column five and six of Table 11. It seems from our sample of Spanish subsidiaries that neither the high tax rate differences nor the situation in which the Spanish tax rate is higher than the foreign tax rate (and profits go from subsidiaries to parent companies), increase negative impact of taxes on profits.

Table 11: Additional explanatory variables

			Crisis* ($T_{ES} - T_{EX}$)	Sector* ($T_{ES} - T_{EX}$)	Hight* ($T_{ES} - T_{EX}$)	Highdift* ($T_{ES} - T_{EX}$)
lnL	0.66 (13.58)***	0.66 (13.58)***	0.67 (13.54)***	0.72 (14.18)***	0.67 (13.59)***	0.66 (13.58)***
lnK	0.05 (2.38)**	0.05 (2.38)**	0.05 (2.35)**	0.02 (1.00)	0.05 (2.37)**	0.05 (2.38)
$T_{ES} - T_{EX}$	-2.74 (-4.27)***	-2.74 (-4.27)***	-2.20 (-3.09)***	-3.42 (-3.89)***	-3.47 (-4.55)***	-3.08 (-4.30)***
GDP pc growth	0.04 (5.99)***					
Inflation	-0.02 (-2.94)***					
Crisis		-0.26 (-7.20)***	-0.27 (-7.29)***			
Interaction Term			-0.66 (-1.85)*	2.35 (1.86)*	1.87 (1.53)	0.48 (0.97)
N	6,890	6,890	6,890	4,945	6,890	6,890
R ²	0.10	0.10	0.10	0.09	0.10	0.10
Subsidiary FE	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: lnL is the logarithm of the cost of employees; lnK is the logarithm of the fixed assets; and $T_{ES} - T_{EX}$ is the difference between the Spanish tax rate and the tax rate of the foreign country where the parent company is situated. Additionally, in column one the GDP pc growth and the inflation rate of the host country (Spain), measured by the consumer prices index, are included. In columns two and three the crisis binary variable and this last variables plus the interaction term $\text{Crisis}^*(T_{ES} - T_{EX})$ are respectively included. The interaction terms $\text{Sector}^*(T_{ES} - T_{EX})$, $\text{Hight}^*(T_{ES} - T_{EX})$ and $\text{Highdift}^*(T_{ES} - T_{EX})$ are added respectively to the basic model in columns four, five and six; each of them is constructed from a binary variable. Sector identifies those economic sectors of parent companies intensive in intangible assets, Hight identifies those

situations in which the subsidiaries tax rate is higher than the respective parent company tax rate, and Highdift identifies high tax rate differences. All specifications include Subsidiary Fixed Effects and Year dummies and estimations are Panel corrected standard error (PCSE) estimations. ***, ** and * denoting statistical significance at the 1, 5 and 10 per cent levels, respectively.

Results for the sample of EU subsidiaries can be seen in Table A4.1 of Appendix 4. It seems that the effects on reported profits from the capital and labour inputs and the tax incentive variable remain also comparable to the ones of the basic specification. However, in this case the additional explanatory variables are not statistically significant except for the crisis variable, which has a surprising anticyclical effect on reported profits¹⁰.

6.2. Alternative indicators of the input variables

Table 12 presents the results for the initial basic model specification taking different combinations of indicators of the capital and labour input variables. We take Total Assets (TOAS) and Tangible Fixed Assets (TFAS) as alternative indicators to the capital input (being our basic indicator Fixed Assets, FIAS). And Number of Employees (EMPL) as alternative labour input indicator (being our basic indicator Cost of Employees, STAF).

Table 12: Alternative indicators

	TOAS, STAF	TFAS, STAF	FIAS, EMPL	TOAS, EMPL	TFAS, EMPL
lnL	0.37 (8.16)***	0.66 (13.50)***	0.58 (12.60)***	0.21 (4.54)***	0.58 (12.71)***
lnK	0.67 (17.87)***	0.02 (1.13)	0.06 (3.33)***	0.75 (19.94)***	0.04 (2.26)**
$T_{ES} - T_{EX}$	-2.20 (-3.46)***	-2.58 (-3.99)***	-2.55 (-3.93)***	-2.02 (-3.17)***	-2.47 (-3.78)***
N	6,915	6,779	6,729	6,754	6,625
R ²	0.16	0.10	0.07	0.14	0.07
Subsidiary FE	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

Note: lnL is the logarithm of the cost of employees or the logarithm of the number of employees, as indicated at the first row of the table; lnK is the logarithm of the fixed assets, the logarithm of total assets or the logarithm of tangible fixed assets, as indicated at the first row of the table; and $T_{ES} - T_{EX}$ is the difference between the Spanish tax rate and the tax rate of the foreign country where the parent company is situated. All specifications include Subsidiary Fixed Effects and Year dummies and estimations are Panel corrected standard error (PCSE) estimations. ***, ** and * denoting statistical significance at the 1, 5 and 10 per cent levels, respectively.

¹⁰ The effect of the crisis variable is negative when we remove the time period dummy variables from the regression.

The results for the tax incentive variable are very similar (slightly lower) than that of the basic model, when the semi-elasticity estimated was of 2.74. The most striking results are related to the introduction of the Total Assets variable, when the coefficient R^2 increases and those of the input variables change, especially for the capital one.

However, results for the tax incentive variable are somewhat different regarding the sample of EU subsidiaries (Table A4.2 of Appendix 4). They vary from a semi-elasticity of 1.61 for the inputs combination Tangible Fixed Assets and Number of Employees to 4.11 for the inputs combination Total Assets and Cost of Employees. On the other hand, the same comments can be made with regard to the introduction of the Total Assets variable.

7. Conclusions

This paper describes the topic of the PS activity of MNEs and reviews the empirical literature related to it to subsequently examine the existence of such activity from the perspective of Spain. Particularly, two samples of companies are studied for the period 2005-2014. One sample is made up of Spanish subsidiaries owned by OECD and EU parent companies, and another is made up of EU subsidiaries owned by Spanish companies.

In line with the empirical literature, indirect evidence consistent with PS is obtained. Our results indicate that reported profits alongside the different territories in which a multinational group operates are altered by taxes and the relationship between the two variables is negative. When the tax rate differences between Spain and the foreign countries vary one percent point reported profits vary around 2.7-3 percent points.

Additionally a series of additional analyses and robustness tests are carried out and in general terms the tax incentive variable keeps similar to the initial result. That is true when the model is broadened including other explanatory variables or when different combinations of the input variables indicators are considered, especially for the sample of Spanish subsidiaries. Regarding the particular outcomes for the additional variables of the different specifications, some differences between samples are found.

With regard to our preferred sample of Spanish subsidiaries (which is bigger than the sample of EU subsidiaries), results show that reported profits are pro-cyclical and that the recent economic crisis affected reported profits negatively. It is also obtained that the effect of the tax incentive on profits is less negative when companies use a high level of intangible assets, what could be explained by the less sensitivity of companies

to taxes when profitability is high. Furthermore, it seems that the effect of the tax incentive is irrespective of the higher or lower level of the Spanish tax rate to the foreign tax rate and of the magnitude of the difference in such tax rates.

Results in terms of tax revenues for Spain of this PS activity from the sample of Spanish subsidiaries vary over the years and depend on the higher or lower tax rate level of the main investor countries in Spain. Actual profits seems to have been higher than reported profits during the first years (2005, 2006, 2007) when the Spanish tax rate was relatively high and also in 2012 and 2014 due to the high reported profits in Spain originated in United Kingdom, a country with a relatively low CIT rate. And years for which PS activity seems to had a positive impact on Spanish tax revenues (actual profits were lower than reported profits) are 2008, 2009, 2010, 2011 and 2013. United States is the main responsible country for this other result as a consequence of its relatively high CIT rate and high reported profits in Spain.

Finally, some future additional analyses related to the tax incentive variable and the samples are possible. On the one hand, we will try to incorporate the tax rate of other affiliated companies into the tax incentive measure as long as PS is a within multinational group activity. And regarding our samples of companies, we will also try to increase the one comprising the EU subsidiaries so as to take into account all main host countries for Spain, mainly U.S, and have a complete outlook of the PS activity connected to Spain.

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Appendix 1: Review of the empirical literature on the Profit Shifting activity of Multinational enterprises motivated by Corporate Income Taxes. Hines and Rice approach¹

Methodological Factors ² , Additional Control Variables and Additional Analyses				
	Sample ³	Profits ⁴ and Tax Incentive ⁵	Real Economic Activity ⁶ and FE ⁷	Additional Control Variables ⁸ and Additional Analyses ⁹
Az�mar (2010)	Treasury Corporate Tax Files; 1992-94-96-98-2000	Ln (Pre-tax profits); TR (average TR)	lnK _i : Ln (Total assets); lnA _i : Ln(GDP pc) Country FE; Year FE	Country: Ln (GDP); Ln (Trade openness); Ln (Inflation); Ln (Exchange rate); Ln (Physical infrastructure); GDP pc (or host country legislative maturity) and an interaction term with the tax incentive; Taxes effect on repatriated dividends and Subpart F income.
Becker and Riedel (2012)	AMADEUS; 1995-2006	Ln (Pre-tax profits); Simple TR difference (statutory TR)	lnK _i : Ln(Fixed assets); lnA _i : Ln(GDP pc) Industry-year dummies	Country: Ln(GDP pc parents); Ln(Population subsidiaries); Ln(Unemployment rate subsidiaries); Ln(Unemployment rate parents); Ln(GDP pc parents)

¹ We summarize the empirical literature based on the Hines and Rice approach, including other papers with a similar approach.

² We summarize the methodological factors that according to Heckemeyer and Overesch (2013) could have affected the magnitude of the results: the sample, the proxies for the model variables and the econometrics.

³ We indicate the database and the time period. The description of the different databases (countries included, information contained and level of data disaggregation) is at the end of this table.

⁴ We indicate the proxy for the dependent variable. We distinguish between four possible proxies: pre-tax earnings (excludes taxes and interest), post-tax earnings (includes taxes but excludes interest), pre-tax profits (excludes taxes but includes interest) and post-tax profits (includes taxes and interest).

⁵ We indicate the proxy for the tax incentive variable. We distinguish between three possible proxies: TR, simple TR difference and weighted TR difference.

⁶ We indicate the proxies for the inputs labour and capital and the level of productivity of the territory where they are situated.

⁷ We indicate the kind of Fixed Effects included in the regression.

⁸ We indicate the additional control variables different from the basic model variables included in the regression.

⁹ We indicate the additional analyses different from the examination of the existence of the PS activity but related to this PS activity; for example, the effect of the PS activity on the tax collection.

Blouin et al. (2011)	BEA; 1982-2005	Ln (Pre-tax profits); Simple TR difference (from foreign marginal TR and US statutory TR)	lnL _i : Ln (Cost of employees); lnK _i : Ln (Total assets); lnA _i : Ln (GDP pc); Industrial FE; Year FE	Conflicting situation (trade-off between minimising CITs and customs duties) dummy; Interaction term with the tax incentive
Clausing (2009)	BEA; 1982-2004	Pre-tax profits/Sales; Pre-tax profits/Employment; Simple TR difference (effective TR; statutory TR)	Through the denominator of the dependent variable	-; PS effect on the US revenue collection
De Simone (2016)	AMADEUS; 2003-2012	Ln (Pre-tax profits); Weighted TR difference (from statutory TR and taking operating revenues as the weighting factor)	lnL _i : Ln (Compensation expense); lnK _i : Ln (Fixed Tangible Assets); lnA _i : Ln (GDP pc); Country FE; Year FE; Industrial FE	Affiliate: Observations that are listed dummy; Observations that are listed as the GUO dummy; Country: Interaction term between the adoption of a common set of accounting standards dummy and the tax incentive
Dischinger (2010)	AMADEUS; 1995-2005	Ln (Pre-tax profits/Number of employees); Simple TR difference: statutory TR; TR	lnL _i : Ln (Cost of employees/Number of employees); lnK _i : Ln (Fixed assets/Number of employees); lnA _i : Ln (GDP pc); Subsidiary FE; Year FE	Affiliate: Total liabilities/Total assets; MNE: Ownership share and an interaction term with the tax incentive; Country: Ln (GDP); Ln (Unemployment rate); Ln (Corruption index)
Dischinger et al. (2014)	AMADEUS; 1995-2007	Ln (Pre-tax profits); Simple TR difference (from statutory TR)	lnL _i : Log(Cost of employees); lnK _i : Log(Fixed Assets); lnA _i : Log(GDP pc); Affiliates FE; Year FE; Industrial FE	Affiliate: Log (Subsidiary total assets / Parent company total assets) and an interaction term with the tax incentive; MNE: Ln (Number of entities in the corporate group) and an interaction term with the tax incentive; Country: High tax subsidiary dummy; Interaction term with the tax incentive; Corruption; Log(GDP)

Dischinger and Riedel (2011)	AMADEUS; 1995-2005	Ln (Pre-tax profits); Simple TR difference	lnL _i : Ln (Cost of employees); lnK _i : Ln (Fixed assets); lnA _i : Ln (GDP pc); Subsidiary FE; Year FE	Affiliate: PS depending on the average intangible intensity; MNE: PS depending on the distribution of intangible assets of a corporate group between high and low tax subsidiaries; Country: Country R&D expenses(%GDP); Population; Corruption index; GDP pc growth; Unemployment rate; Taxes effect on the intangible assets location
Grubert (2003)	Treasury Corporate Tax Files and; 1996	Pre-tax profits/Sales; TR (statutory TR)	lnK _i : Ln (Assets/Sales) lnA _i : Ln (GDP pc);	CFC: CFC age<5 years; CFC age 5- 15 years; Debt/Asset; MNE: Parent R&D/Sales; Parent advertisement/Sales; Parent domestic profits/Sales; Ln (Parent sales); Interaction terms with the tax incentive; The links between intangible income, intercompany transactions, income shifting and the choice of location; Main PS strategies
Grubert (2012)	Treasury Corporate Tax Files; 1996 and 2004	Change in Profits/Sales Change in TR (MNE's Average Effective Foreign TR)	Through the denominator of the dependent variable	CFC: A dummy for companies incorporated after 1980; Ln (Sales), 1996; Change in worldwide profits/Sales; MNE: Parent R&D/Sales, 2004; Parent advertising/Sales, 2004; Interaction term with the tax incentive; Country: Average effective foreign TR 1996 (effects of tax differences over time): Explanation on the growing share of U.S. MNE income abroad (linkage between the firm level results and the change in the foreign share of aggregate MNE income)

Grubert and Mutti (1991)	BEA; 1982	Post-tax profits/Sales; Post-tax profits/Equity; TR (statutory TR; average effective TR)	Through the denominator of the dependent variable;	Country: GDP growth rate between 1975 and 1982
Hines and Rice (1994)	BEA; 1982	Ln (Pre-tax earnings); Ln (Pre-tax profits); TR (average TR)	lnL _i : Ln (Total employee compensation); lnK _i : Ln (Plant, Property and Equipment); lnA _i : Ln (GDP pc)	
Huizinga and Laeven (2008)	AMADEUS; 1999	Ln (Pre-tax earnings); Ln (Pre-tax profits); Weighted TR difference (from statutory TR and taking sales as the weighting factor)	lnL _i : Ln (Total Labour compensation); Ln (Number of employees); lnK _i : Ln (Fixed assets); lnA _i : Ln (GDP pc); Industrial FE	Affiliate: A dummy variable indicating Eastern European firms and an interaction term with the tax incentive; Total debt/Total assets; Country: Corruption
Lohse and Riedel (2013)	AMADEUS; 1999-2009	Ln (Pre-tax earnings); Ln (Pre-tax earnings/Total Assets); Ln (Pre-tax profits); Ln (Pre-tax profits/ Total Assets); TR (statutory TR); simple TR difference	lnL _i : Ln (Cost of employees); lnK _i : Ln (Fixed Assets); lnA _i : GDP pc; Subsidiary FE; industry-year FE	Country: PS depending on the Transfer Pricing rules; GDP; GDP growth; Unemployment rate; Corruption; Linear time trend and an interaction term with the tax incentive

Loretz and Mokkas (2015)	AMADEUS; 2002-2009	Post-tax earnings/Assets; Post-tax profits/Assets ¹⁰ ; Pre-tax earnings/Assets; Pre-tax profits/Assets TR (statutory TR)	$\ln L_i$: Ln (Number of employees); $\ln K_i$: Ln (Total assets); Subsidiary FE; year FE	Affiliate: Leverage; Country: GDP growth; Ln(Inflation rate); Interest rate
Markle (2016)	ORBIS; 2004-2008	Ln (Pre-tax profits); Weighted average TR (from statutory TR and taking operating revenues as the weighting factor)	$\ln L_i$: Ln (Compensation expense); $\ln K_i$: Ln (Tangible Fixed Assets); $\ln A_i$: Ln (GDP pc); Parent-firm FE; Year FE	Country: Interaction term between the taxation of foreign income dummy and the tax incentive
McDonald (2008)	Treasury Corporate Tax Files; 1996, 2000 y 2002	Pre-tax earnings/Sales; TR (statutory TR)	Assets/Sales	CFC: CFC age<5 years; CFC age 5-15 years; MNE: Parent R&D/Sales; Parent advertising/Sales; Parent domestic profits/Sales; Ln (Parent sales). Cost sharing arrangements and an interaction term with the tax incentive
Mills and Newberry (2004)	Treasury Corporate Tax Files; 1987-1996	Pre-tax profits/Assets; Pre-tax profits/Sales; Simple TR difference (from the US statutory TR and the average TR of the foreign parent company; and from statutory TRs)	Through the denominator of the dependent variable; Year FE; Industrial FE; Parent country FE	CFC: Altman's bankruptcy predictor score; Age; Sales/Total sales; MNE: Intangible assets/Assets; Pre-tax profits/Assets; Tax incentive effect on the debt levels

¹⁰ In this case, the denominator of the dependent variable is introduced to control for the sensitivity of capital to taxes, as far as proxies for the companies' real operations are included on the right hand side of the equation in absolute terms.

Schwarz (2009)	BEA; 1999-2001	Pre-tax profits/Sales; Pre-tax profits/Assets; TR (statutory TR; effective TR)	Through the denominator of the dependent variable;	Country: GDP growth; Political risk; Replacing the dependent variable by Equity capital/(Equity capital +debt) and Retained earnings/Stocks
Weichenrieder (2009)	MiDi; 1996-2003	Post-tax profits/Total assets; TR	$\ln L_i$: Ln (Employment), $\ln K_i$: Ln (Fixed Assets); Firm effects; Time effects	Affiliate: Ln (Sales); Debt/Total assets; Dummy variable depending on the ownership percentage; Country: GDP growth; Domestic private credit/GDP

Note. Databases information:

AMADEUS. Accounting consolidated and unconsolidated data on private and publicly owned European firms as well as on their ownership relationships.

ORBIS. Accounting consolidated and unconsolidated data on private and publicly owned worldwide firms as well as on their ownership relationships.

MiDi. Inward and outward German multinationals data on a set of balance sheet items (including yearly profit after taxes but before dividend distributions as a separate part of the equity of the firm), plus data on sales and employees and microdata on FDI.

BEA. Financial and operating data on U.S. multinational corporations.

Treasury Corporate Tax Files. Financial data on the 7,500 largest foreign corporations controlled by U.S. multinationals.

Compustat. Financial data on US MNEs.

Appendix 2: Some explanatory figures of the tax revenue results**Table A2.1. Evolution of the number of observations by parent company's country and year**

GUO country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AT	4	6	5	5	4	5	1	2	3	5
AU	2	2	1	1	1	1	2	3	2	3
BE	16	16	14	18	16	20	21	20	19	19
CA	12	13	13	13	13	15	12	14	13	10
CH	25	27	28	25	22	27	23	26	34	23
CL	2	2	2	2	2	1	2	2	2	1
CY	2	2	2	1	2	2	1	2	3	1
CZ	0	0	0	0	0	0	1	0	1	0
DE	70	74	77	69	64	81	81	76	83	71
DK	14	15	15	18	17	18	21	22	23	16
FI	8	8	8	7	7	8	7	7	7	6
FR	46	55	54	48	51	60	61	70	63	50
GB	55	56	56	57	57	66	64	68	62	50
GR	0	0	0	0	0	0	1	1	0	2
IE	9	12	12	10	10	10	9	13	7	8
IL	1	1	2	2	3	3	3	5	4	3
IS	1	1	0	0	0	0	0	0	1	0
IT	32	34	34	31	31	40	35	32	36	34
JP	55	59	60	59	54	65	65	56	65	33
KR	1	3	4	3	6	4	3	5	6	6
LU	64	66	69	59	66	77	75	67	76	76
MT	1	2	3	1	2	4	3	4	4	3
MX	3	4	1	3	4	5	5	3	7	5
NL	44	41	42	42	36	51	47	48	51	42
NO	3	5	5	5	2	5	5	4	5	5
NZ	1	1	1	1	1	1	1	1	1	1
PL	1	2	1	1	2	3	2	2	2	1
PT	6	6	6	7	7	7	8	8	7	5
SE	9	10	10	10	9	12	11	11	11	12
SI	0	1	1	1	0	1	1	1	1	1
SK	1	1	0	1	0	1	1	1	1	1
TR	1	2	2	2	1	2	2	0	0	0
US	172	185	189	189	191	214	214	213	208	147

Table A2.2. Difference in profits by parent company's country and year (% of total difference in profits)

GUO country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AT	1.11	8.13	2.76	1.74	0.20	0.31	0.15	18.23	2.30	0.15
AU	0.21	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BE	1.20	0.34	-2.57	-2.42	-1.05	-2.33	-4.29	-5.12	-22.24	-0.50
CA	-0.75	-0.54	-9.70	-2.95	-2.88	-1.41	4.55	19.31	70.93	1.85
CH	112.37	37.96	197.69	83.21	30.43	24.90	30.25	48.68	317.58	3.35
CL	0.43	0.22	1.49	0.22	0.10	0.00	0.23	0.36	2.02	0.04
CY	2.66	1.17	4.86	0.94	2.58	1.83	1.52	1.31	56.55	0.02
CZ	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	3.16	0.00
DE	-44.71	-11.53	-99.43	3.09	2.51	5.80	10.78	11.65	35.71	1.02
DK	2.16	1.55	27.10	7.30	6.32	8.21	3.67	6.73	28.16	0.56
FI	6.80	1.70	7.44	1.82	1.11	0.73	0.99	0.65	5.30	0.33
FR	9.82	6.84	-28.73	-48.49	-19.35	-68.89	-30.39	-63.39	-297.81	-6.58
GB	61.08	58.17	217.00	0.00	43.44	39.78	65.23	216.80	311.05	106.98
GR	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.16	0.00	0.01
IE	46.19	20.01	91.21	20.67	17.96	33.14	42.10	112.69	158.04	5.06
IL	0.11	0.01	0.64	3.87	1.26	1.41	8.80	8.60	0.25	0.01
IS	0.15	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00
IT	-6.11	-0.72	-11.88	-1.65	-1.17	-2.92	-2.66	-3.94	-19.18	-0.56
JP	-28.33	-7.94	-84.94	-24.31	-18.83	-27.47	-35.26	-24.87	-134.42	-1.03
KR	0.06	0.32	1.80	0.08	1.59	3.55	5.77	12.78	26.19	0.39
LU	17.07	8.07	34.70	0.97	4.18	4.37	8.96	8.24	35.55	1.28
MT	0.00	0.00	-0.25	-0.01	-0.20	-0.32	-0.68	-0.61	-4.49	-0.07
MX	0.04	0.09	0.07	0.16	0.46	0.00	0.00	0.00	0.00	0.00
NL	18.04	6.78	45.14	13.61	5.35	17.56	26.70	26.27	197.49	2.13
NO	0.34	0.15	0.54	0.15	0.04	0.09	0.17	0.25	3.92	0.06
NZ	0.05	0.02	-0.03	0.00	0.00	0.00	0.02	0.03	0.15	0.01
PL	0.25	0.56	1.34	0.55	0.92	0.47	0.26	0.39	1.97	0.05
PT	5.73	1.75	11.56	3.12	2.10	2.98	2.51	44.57	29.49	1.72
SE	14.76	3.28	12.14	0.77	1.40	1.12	4.45	3.40	37.46	1.58
SI	0.00	0.02	0.03	0.01	0.00	0.09	0.06	0.09	0.17	0.01
SK	0.27	0.02	0.00	0.04	0.00	0.05	0.33	0.26	0.25	0.00
TR	0.40	0.10	0.79	0.04	0.01	0.06	0.10	0.00	0.00	0.00
US	-121.40	-36.60	-320.79	-162.53	-178.48	-143.11	-244.40	-343.51	-945.67	-17.88

Note: This table shows the percentage that the difference between actual and reported profits by parent's company country and year stands for on the annual total positive or negative difference. A negative (positive) sign indicates that for that residence country and year, actual profits in Spain were lower (higher) than reported profits and so, that PS was beneficial (harmful) for Spain.

Table A2.3. Spanish and Parent companies' country Corporate Income Tax Rates

Parent company	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AT	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
AU	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
BE	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
CA	0.36	0.36	0.36	0.34	0.33	0.31	0.28	0.26	0.26	0.27
CH	0.21	0.21	0.21	0.19	0.19	0.19	0.18	0.18	0.18	0.18
CL	0.17	0.17	0.17	0.17	0.17	0.17	0.20	0.19	0.20	0.20
CY	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.13	0.13
CZ	0.26	0.24	0.24	0.21	0.20	0.19	0.19	0.19	0.19	0.19
DE	0.38	0.38	0.38	0.30	0.29	0.29	0.29	0.29	0.30	0.30
DK	0.28	0.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
EE	0.24	0.23	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21
FI	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.25	0.20
FR	0.34	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
GB	0.30	0.30	0.30	0.30	0.28	0.28	0.26	0.24	0.23	0.21
GR	0.32	0.29	0.25	0.25	0.25	0.24	0.20	0.20	0.26	0.26
IE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
IL	0.34	0.31	0.29	0.27	0.26	0.25	0.24	0.25	0.25	0.27
IS	0.18	0.18	0.18	0.15	0.15	0.18	0.20	0.20	0.20	0.20
IT	0.37	0.37	0.37	0.31	0.31	0.31	0.31	0.31	0.31	0.31
JP	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.38	0.38	0.36
KR	0.28	0.28	0.28	0.28	0.24	0.24	0.22	0.24	0.24	0.24
LU	0.30	0.30	0.30	0.30	0.29	0.29	0.29	0.29	0.29	0.29
MT	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
MX	0.30	0.29	0.28	0.28	0.28	0.30	0.30	0.30	0.30	0.30
NL	0.32	0.30	0.26	0.26	0.26	0.26	0.25	0.25	0.25	0.25
NO	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.27
NZ	0.33	0.33	0.33	0.30	0.30	0.30	0.28	0.28	0.28	0.28
PL	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
PT	0.28	0.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.23
SE	0.28	0.28	0.28	0.28	0.26	0.26	0.26	0.26	0.22	0.22
SI	0.25	0.25	0.23	0.22	0.21	0.20	0.20	0.18	0.17	0.17
SK	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.23	0.22
TR	0.30	0.30	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
US	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
MEAN	0.28	0.28	0.27	0.26	0.26	0.26	0.25	0.25	0.25	0.25
ES	0.35	0.35	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30
ES-MEAN	0.07	0.07	0.06	0.04	0.04	0.04	0.05	0.05	0.05	0.05

Note: This table shows the highest marginal nominal CIT Rates, including local taxes.

Table A2.4. Reported profits (% of total reported profits) by parent company's country and year*

GUO country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AT	0.12	2.16	0.15	0.47	0.06	0.07	0.03	2.19	0.09	0.13
AU	0.05	0.03	0.00	0.01	0.02	0.04	0.03	0.13	0.16	0.04
BE	1.30	0.91	0.69	0.82	0.40	0.67	1.09	0.77	1.08	0.56
CA	0.74	1.30	1.08	1.15	1.47	1.63	2.30	2.90	3.45	2.33
CH	8.95	7.36	6.69	10.47	4.23	2.55	2.62	2.45	5.15	1.22
CL	0.03	0.03	0.04	0.02	0.01	0.00	0.02	0.02	0.04	0.02
CY	0.12	0.12	0.09	0.06	0.20	0.11	0.08	0.04	0.63	0.01
CZ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00
DE	14.73	9.18	6.82	8.56	6.87	11.34	17.31	13.47	15.43	10.66
DK	0.34	0.59	1.45	1.98	1.94	1.90	0.74	0.81	1.10	0.45
FI	0.82	0.50	0.46	0.62	0.42	0.21	0.25	0.07	0.19	0.15
FR	9.15	10.89	13.91	19.77	8.93	23.87	9.23	11.44	17.39	8.70
GB	13.33	30.92	34.87	16.56	33.36	22.95	16.50	21.72	8.64	52.32
GR	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
IE	2.24	2.36	1.83	1.60	1.58	2.19	2.43	3.87	1.76	1.27
IL	0.12	0.01	0.07	1.75	0.48	0.32	1.48	1.03	0.01	0.02
IS	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IT	2.96	0.85	1.00	1.60	1.28	2.41	1.92	1.69	2.66	1.74
JP	5.43	3.71	4.17	3.09	2.71	2.96	3.34	1.87	3.26	0.81
KR	0.01	0.11	0.14	0.05	0.42	0.71	0.73	1.32	0.88	0.29
LU	4.03	3.99	4.86	3.57	4.55	3.58	7.56	4.13	8.86	7.24
MT	0.07	0.04	0.04	0.00	0.06	0.08	0.14	0.07	0.17	0.06
MX	0.01	0.04	0.01	0.11	0.35	0.22	0.17	0.13	0.44	0.16
NL	5.62	3.34	2.59	4.11	1.83	4.50	5.40	3.16	7.68	1.88
NO	0.05	0.06	0.05	0.10	0.03	0.05	0.08	0.07	0.38	0.08
NZ	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
PL	0.02	0.09	0.04	0.07	0.13	0.05	0.02	0.02	0.03	0.02
PT	0.83	0.62	0.62	0.85	0.64	0.69	0.51	5.36	1.15	1.08
SE	2.30	1.25	1.08	0.52	0.58	0.35	1.22	0.55	0.91	0.87
SI	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
SK	0.02	0.00	0.00	0.01	0.00	0.01	0.03	0.01	0.01	0.00
TR	0.09	0.05	0.03	0.01	0.00	0.01	0.01	0.00	0.00	0.00
US	26.49	19.45	17.19	22.06	27.42	16.51	24.73	20.65	18.38	7.87

Note: This table shows the percentage of total reported profits by parent company's country and year.

Appendix 3: Limited Spanish subsidiaries sample

$\ln L$	0.63 (9.99)***
$\ln K$	0.04 (1.47)
$T_{ES} - T_{EX}$	-2.94 (-3.94)***
N	3,931
R^2	0.11
Subsidiary FE	Yes
Year dummies	Yes

Appendix 4: Additional analyses and robustness tests for the sample of EU subsidiaries

Table A4.1. Additional explanatory variables

			Crisis* ($T_{ES} - T_{EX}$)	Sector* ($T_{ES} - T_{EX}$)	Hight* ($T_{ES} - T_{EX}$)	Highdift* ($T_{ES} - T_{EX}$)
lnL	0.55 (7.32)***	0.54 (7.12)***	0.54 (7.10)***	0.53 (6.56)***	0.54 (7.11)***	0.54 (7.09)***
lnK	0 (0.32)	0 (0.31)	0 (0.32)	0 (0.16)	0 (0.32)	0 (0.29)
ln(GDP pc)	-0.80 (-1.06)	-0.65 (-0.86)	-0.96 (-1.24)	-0.38 (-0.46)	-0.67 (-0.88)	-0.73 (-0.97)
$T_{ES} - T_{EX}$	-3.09 (-2.06)**	-2.99 (-1.98)**	-2.61 (-1.66)*	-2.99 (-1.96)**	-1.96 (-0.90)	-3.42 (-2.19)**
GDP pc growth	0.01 (0.67)					
Inflation	-0.04 (-1.53)					
Crisis		0.18 (1.88)*	0.14 (1.40)			
Interaction Term			-1.03 (-0.97)	16.99 (1.47)	-0.73 (-0.90)	1.61 (1.30)
N	1,648	1,648	1,648	1,474	1,648	1,648
R ²	0.09	0.09	0.09	0.10	0.09	0.09
Subsidiary FE	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: lnL is the logarithm of the cost of employees; lnK is the logarithm of the fixed assets; $T_{EU} - T_{ES}$ is the difference between the tax rate of the EU country where the subsidiary company is situated and the Spanish tax rate. Additionally, in column one the GDP pc growth and the inflation rate of the host country, measured by the consumer prices index, are included. In columns two and three the crisis binary variable and this last variables plus the interaction term $Crisis*(T_{ES} - T_{EX})$ are respectively included. The interaction terms $Sector*(T_{ES} - T_{EX})$, $Hight*(T_{ES} - T_{EX})$ and $Highdift*(T_{ES} - T_{EX})$ are added respectively to the basic model in columns four, five and six; each of them is constructed from a binary variable. Sector identifies those economic sectors of (Spanish) parent companies intensive in intangible assets, Hight identifies those situations in which the subsidiaries tax rate is higher than the respective parent company tax rate, and Highdift identifies high tax rate differences. All specifications include Subsidiary Fixed Effects and Year dummies and estimations are Panel corrected standard error (PCSE) estimations. ***, ** and * denoting statistical significance at the 1, 5 and 10 per cent levels, respectively.

Table A4.2. Alternative indicators

	ALTERNATIVE INDICATORS				
	TOAS, STAF	TFAS, STAF	FIAS, EMPL	TOAS, EMPL	TFAS, EMPL
lnL	0.19 (2.34)**	0.58 (7.64)***	0.46 (7.44)***	0.14 (2.30)**	0.47 (7.84)***
lnK	0.67 (9.44)***	-0.02 (-0.96)	0.05 (1.62)	0.77 (12.24)***	0.02 (0.92)
$T_{EU} - T_{ES}$	-4.11 (-2.77)***	-2.88 (-1.93)*	-1.67 (-1.13)	-2.75 (-1.86)*	-1.61 (-1.08)
ln(GDP pc)	-0.74 (-1.04)	-0.81 (-1.06)	-0.17 (-0.24)	-0.91 (-1.34)	-0.24 (-0.34)
N	1,666	1,640	1,493	1,510	1,490
R ²	0.16	0.09	0.07	0.17	0.07
Subsidiary FE	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes

Note: lnL is the logarithm of the cost of employees or the logarithm of the number of employees, as indicated at the first row of the Table; lnK is the logarithm of the fixed assets, the logarithm of total assets or the logarithm of tangible fixed assets, as indicated at the first row of the Table; $T_{EU} - T_{ES}$ is the difference between the tax rate of the EU country where the subsidiary company is situated and the Spanish tax rate; and ln(GDP pc) is the logarithm of the GDP pc of the host country. All specifications include Subsidiary Fixed Effects and Year dummies and estimations are Panel corrected standard error (PCSE) estimations. ***, ** and * denoting statistical significance at the 1, 5 and 10 per cent levels, respectively.